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Exploring the Conversion of ICTs to Basic Capabilities in Community ICT Interventions: Case Studies in Western Kenya

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Declaration

This research is my original work and has not been presented for a degree award or any other award in any other university.

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Dedication

To the LORD God Most High – the God of Israel – who has borne me on the pinion of His wings on this long, arduous journey of many years, and given me the grace to persevere, learn, work and complete the research.

Abstract

Since the 1990s, a lot of resources have been invested by governments, bilateral and multilateral donors and other international development organizations to support ICT-for-poverty-reduction initiatives and projects. The results have been mixed and some projects have been downright failures. Whereas various reasons have been advanced for this state of affairs, researchers have observed that there exists insufficient knowledge on the process of converting the ICTs to capabilities, especially the contextual circumstances and facilitating conditions that enable the conversion, leading to poverty reduction outcomes. This research sought to address this gap, with a view to explore how conversion takes place.

The research was inductive and utilized revelatory multi-case studies and micro-ethnography. The case studies involved semi-structured interviews of informants and a focus group, while for the micro-ethnography, the researcher visited the location of the projects in the cases and stayed there for a sometime, interacting, observing, interviewing. This happened in three phases over a period of one and half years. The two cases were located in Western Kenya and involved basic ICTs skills training to poor rural communities. The informants were beneficiaries of the training projects who had gone on to utilize their knowledge to improve their well-being. After collection of the data, transcription was carried out followed by analysis, which led to a carefully written account of the cases.

The research established that conversion involved three stages: decision to acquire knowledge to utilize ICTs, establishing whether the ICT-enabled functioning opportunity is valuable, and determining ability to achieve the functioning. The research opened the black box of conversion and traced the interaction of the different factors, resources and ICTs. It mapped out how ICTs and other resources interact and affect each other, how conversion factors affect each other and resources and the influence resources have on conversion factors, and how this enabled or constrained conversion.

In conclusion, it became clear that personal conversion factors affected the key determinants of each stage of the conversion process, and hence played a key part in conversion. This is reinforced by the fact that even where the same ICT intervention is availed to the community, the actual capability an individual converts from ICTs depends

on the characteristics of the individual. Social conversion factors clearly have an influence on each of the identified stages in the conversion process. On the actual capabilities converted from the ICTs, it became clear that they are not all basic: they are mixed (basic and non-basic) and the basic capabilities were not necessarily prioritized by the poor.

From the research findings, it is recommended that conception and design of ICT-for-poverty-reduction initiatives and projects should be capability-sensitive: they must take personal and social conversion factors into consideration. They must also consider the resources that are required.

From the research, the following recommendations can be made for ICT-for-poverty-reduction projects:

- Work with the community to identify valued basic capabilities that the interventions will seek to achieve.
- Identify the personal and social conversion factors at work in the community, and the availability of resources that are likely to affect the adoption, use and conversion of ICTs to valued capabilities
- Adopt capability-sensitive designs.
- Awareness creation and community engagement to address negative discourses on ICTs, and education to give the required ICTs knowledge may be necessary.

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Key Terms

Capability is the freedom to achieve what a person values to do and to be.

Conversion factors are personal, social and environmental characteristics that influence the degrees of capabilities that one can generate from resources

Freedom is the real opportunity that we have to accomplish what we value and have reason to value.

Functioning – what a person values to be and to do.

Information and Communication Technologies (ICTs) - socio-technical configurable technologies consisting of a combination of electronic information processing systems and communication technology, people (in their various roles and relationships), techniques, support resources and information structures.

Poverty represents the absence of some basic capabilities to function - a person lacking the opportunity to achieve some minimally acceptable levels of these functionings. Poverty is a multi-dimensional phenomenon: it is not only about lack of income – it is also about human deprivations in areas of health, education, participation, security, etc.

Value: a discrete heterogeneous set of the most basic and simple reasons for acting which reflect the complete range of kinds of valuable human states and actions (the complete range of functioings) or the basic purposes of human action, or things which are worth wanting

List of Abbreviations

CA – Capability Approach

ICTs – Information and Communication Technologies

ICT4D – Information and Communication Technologies for Development

PEOU – Perceived Ease of Use

PU – Perceive Usefulness

SLA – Sustainable Livelihoods Approach

SST – Social Shaping of Technology

SSV – Sega Silicon Valley

TAM – Technology Acceptance Model

TRA – Theory of Reasoned Action

UCRC – Ugunja Community Resource Centre

UNDP – United Nations Development Program

UTAUT – Unified Theory of Acceptance and Use of Technology

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1. INTRODUCTION

This chapter is an introduction and overview of the whole thesis. It begins by outlining the domain of the research, situating the problem and pointing out why there is an urgency to address them (Section 1.1). Section 1.2 briefly introduces the problem and gives a rationale why it should be addressed. After that the various approaches being used by the development community to inform their policy and practice on poverty reduction using Information and Communication Technologies (ICTs) are briefly outlined in Section 1.3. In the next section the approach adopted in this research is briefly outlined. Next follows the research questions, the scope of the study and a justification. The last section gives a brief overview of the rest of the chapters of the thesis.

1.1 Background of the Study

There is a broad consensus that poverty is a problem in the 21st century. Policy makers, political leaders and development practitioners agree that a world in which half of the population lives in poverty is neither just nor stable and cannot be sustained in the long run (Sacchs, 2005, pp. 330-337). A lot of progress has been made in reducing extreme poverty the world over in the last few decades. However, despite the outstanding progress made, the fight against poverty in the Lower Income countries (LICs) is yet to be won: most of the reduction in extreme poverty has taken place in India and China. By the year 2010, 1.21 Billion people lived in extreme poverty (Olinto, et al., 2013); (UN, 2013). Of these, 394 Million (33%) were in India, 352 Million (29 %) were from the Lower Income countries, 260 Million (26 %) were found in Lower Middle Income countries, 155 Million (13%) lived in China, and 48 Million (4 %) lived in Upper Middle Income countries. Further, even though extreme poverty reduced by about by 33 % in Lower Income countries, the actual number of extreme poor in these countries increased by 103

Million. The full picture of the problem gets clearer when we realize that about 44 percent of the citizens of Lower Income countries were living in extreme poverty by 2010. With all the commendable poverty reduction efforts by country governments, bilateral and multilateral donors, the United Nations and other development community players, it is clear that the fight against poverty is far from over.

The 1997 Human Development Report of UNDP reminds us that poverty is not just about income or consumption: '…poverty means that opportunities and choices most basic to human development are denied – to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-respect and the respect of others' (UNDP, 1997).

In acknowledging the urgency of the problem, the International community met under the auspices of the Millennium Summit of the UN and came up with the Millennium Development Goals (which really are poverty reduction goals) that were to be achieved by the year 2015. There were 8 goals and 18 targets that were to be met by the agreed date. These goals and targets were set in a quest to address the different dimensions of poverty. By 2013, even though a number of the targets had been achieved, progress towards others has been slow and we are far from attaining them. The first goal of reducing extreme poverty by half between 1990 and 2015 was realized five years early. The goal on Universal primary Education was not be met. Similarly, Goal 4 on reducing child morality was not met. Another goal that fell short of attainment is Goal 5 on improving maternal health. Goals seven (Ensure environmental sustainability) and eight (Develop a global partnership for development) were not achieved by 2015 (UN, 2013). As can be seen, a number of MDGs were not be achieved by the 2015 target date. From a Human Development point of view, because these global poverty reductions goals were not met poverty continues to be a challenge. With the adoption of the Sustainable Development Goals adopted in October 2015, the global community has already has began to work towards a post 2015 agenda.

There are many approaches and initiatives undertaken in an attempt to reduce poverty. Since the 1990s, there has been an implicit consensus among the development practitioners that ICTs carry a lot of promise as technologies for poverty reduction. The UNDP in the mid-1990s was instrumental in encouraging developing countries to

formulate ICT strategies and policies geared towards development and poverty reduction. As this trend caught momentum and as the world at large continued to appreciate the potential of ICTs to access information, services, people and communication, and with the perceived relationship between this and growth becoming more mainstream, the UN sponsored a summit – the World Summit for the Information Society (WSIS). Phase 1 of the WSIS was held in Geneva in December 2003, with second held in Tunis in November 2005. In the declaration of principles in the Geneva round, there was an acknowledgment of the central role that ICTs play in people's lives including '… enabling creation, access, utilization and sharing of information and knowledge that would enable individuals, communities and peoples to achieve their full potential in promoting their sustainable development, and improving their quality of life'. It goes on to say that ICTs can play a central role in human progress, endeavor and well being, and that they can be used to promote the MDGs. Between the first round in Geneva and the final round in Tunis, a task force (the ICT Task force) was put in place to coordinate the technical aspects of the WSIS and advice the office of the UN Secretary General. One of the tasks they did was to come up with a MDG-ICT matrix showing how ICTs can be utilized in a bid to achieve the various targets of the MDGs, thereby demonstrating the high expectation, held by many, of ICTs being instrumental to poverty reduction.

One of the development players that have been instrumental in promoting the ICT-for-Development and Poverty Reduction agenda is the World Bank. Their flagship World Development Report for 1998/1999 titled 'Knowledge for Development' went to great lengths to expound the central role of knowledge in addressing development and poverty reduction and the role of ICTs in facilitating the acquiring, processing, storing and disseminating this knowledge. The World Bank 'put its money where its mouth was' - it is estimated that by the turn of the millennium, the World Bank was spending between US $ 1 Billion to $ 2 Billion on ICT for poverty reduction and development yearly (Bailur, 2007). The World Bank also established the Global Development Gateway, 'a proactive policy that fosters network development in emerging economies', with the key objective of using the internet 'as a tool to reduce poverty and support sustainable development' (World Bank, 2000). The Development Gateway - the 'premier web entry point on poverty and sustainable development' - is a database about aid agency projects,

listings of organizations working on development, an online bookstore, edited selections of analysis and links on 130 policy issues, franchised Country Gateway websites, and sub-sites operated by other, approved, organizations and networks (Thompson, 2004). According to Aslam (2001), the Gateway was established as a US $ 7 M project.

From the above, it is clear that poverty is a problem and its resolution is urgent. It is also clear that many among the development community and donors believe that ICTs have potential for the resolution. With this in mind, the development community has invested billions of dollars in initiatives to reduce poverty using ICTs. With the urgency of poverty reduction, the perceived promise of ICTs and the amounts of resources being invested, it becomes important to observe if these initiatives are yielding the anticipated results and if not explore possible reasons why. It is important to ensure that the beneficiaries of these initiatives are really getting the benefits anticipated and that the investments will yield value for money. This is even more important when we consider the scarce resources that exist and the many that compete for them.

1.2 The Problem

Whereas so much effort and resources have been invested in ICT-for-Poverty Reduction initiatives by development agencies, donors and other international organizations, there lacks clear results of these efforts. Many of these initiatives have supported pilot studies and projects but very few of these have been scaled up and there are no clear strategies for scaling up (McNamara, 2003). Clearly, there is a lot of investment of resources in this endeavor and it indeed seems to carry a lot of potential and there has been hope that the effort will deliver results. As we consider the scourge of poverty and the fact that progress on poverty reduction is slow, there obviously is an urgent search for more efficient ways to reduce poverty and many have turned to ICTs as we have observed. Review of research in the use of ICTs for development and poverty reduction suggests that there is little to show for all the initiatives except a few often quoted cases (APDIP, 2005; Soeftestad and Sein, 2002). There is need to investigate why this is the case. In seeking to understand the reasons for the less than satisfactory success some researchers state that has been an overemphasis on technology, and that there lacked a clear

explanation of what capabilities of ICTs can address different dimensions of poverty (McNamara, 2003; Heeks, 2009)

Some of the more critical views have suggested that the emphasis of using ICTs for poverty reduction and development is a replay of modernization theories and technology transfers that were abandoned in mid-twentieth Century (Nulens, 2003; Heeks, 2009). As the world awaits more efficient ways of reducing poverty so that the scarce resources can be used more effectively, and as the development community invests ever increasing resources on these initiatives with less than satisfactory results, there is obviously an urgent need to come up with more effective and efficient ways of reducing poverty using ICTs.

A review of many of these initiatives reveal that the assumptions and models used (to justify them and to inform the designs of the technologies) have omissions and at times misplaced theoretical underpinnings. Some researchers have pointed out that there has lacked in most of these initiatives a clear theoretical understanding of ICTs and how their capabilities can be utilized in helping to deal with the different dimensions of poverty (APDIP, 2005). In some instances, the rationale and approach behind poverty and poverty reduction has revealed some weaknesses. One dominant approach that runs through many of the poverty reduction initiatives is that the poor are poor due to lack of information (about their livelihoods, about health, about the market, about their rights, about government and services, etc.) The way to tackle poverty, according to this approach, is to give the poor access to the information they lack. Many initiatives therefore advocate the use of certain ICTs to give access to or avail the required information to the poor. This trend can be observed in the policies and practice of many donor organizations (Gerster & Zimmermann, 2003); (Marker, McNamara and Wallace, 2002). The assumptions behind this approach are taken as a given without showing explicitly how they are supported by established theories of poverty reduction. This anomaly needs to be addressed since the whole purpose is poverty reduction, with ICTs just being an enabling technology.

McNamara (2003:7) says that 'ICTs are, to some extent, social constructs. … they need to be adapted to different social contexts'. He goes on to explain that these ICTs, being a

product of economic and social conditions in the developed countries, can only answer specific needs of these contexts and will not necessarily be well-suited to the needs of the forms of social and economic organization common to people in the poor countries. He advocates for innovation of ICTs that specifically address the needs and conditions of these development countries, for them to be effective as enablers of poverty reduction. This shows the need for considering the contextual issues around the poor in their communities if we are to develop and implement ICT solutions that will serve in reducing poverty in their communities. Investigating the factors that influence the way that people choose certain characteristics of ICTs and utilize them in improving their well-being is therefore important.

After reviewing 21 peer-reviewed research papers on the use of ICTs for poverty reduction for the United Nations Development Programme's Asia-Pacific Development Information Programme (UNDP-APDIP), Roger Harris points out shortcomings of the practice and policy in using ICTs for Poverty reduction. He says that 'there is vagueness about which ICTs are most appropriate under which circumstances' and that 'there exits insufficient explanation of the contextual circumstances and pre-conditions necessary to make ICTs effective.' He goes on to recommend that utilization of ICTs for poverty reduction should have as an objective that there should be ' a clearer definition of the facilitating conditions that allow ICTs to be effective and how these conditions were created.' (APDIP, 2005:6-7). This clearly points out the fact that there is paucity of research on the contextual circumstances and pre-conditions necessary to make ICTs effective and that there should be a clear definition of the facilitating conditions that allow ICTs to be effective and how these conditions can be created.

Zheng (2007) recommends the need to investigate the contextual conditions necessary for the successful use of ICTs for development, including the potential well-being that can be realized from certain ICTs, the appropriateness of the local conditions for the same, how the poor decide on the ICTs to adopt and how this is influenced by ICTs, and the factors that enable the poor to realize well-being from ICTs. In addition, there is hardly any work done to establish what influences an individual in deciding on the characteristics of ICTs they will choose in their quest to improve their well-being (to be and to do what they have reason to value) and how ICTs influences them. Further, little has been done to

determine the effect of ICTs on the agency of the poor. There is therefore need to investigate the above issues since these are the very contextual conditions that we mentioned have not been investigated. This research therefore seeks to address these critical, little-investigated aspects of the ICT-for-poverty Reduction space.

1.3 What has been the Approach of the Development Community So far?

There have been many different approaches to poverty reduction using ICTs so far but a few emphases can be identified. Firstly, there has been an over-emphasis on ICTs as 'tools' for poverty reduction. Whereas it is fitting to think of ICTs not as end but a means to an end, it has been pointed out that the tool metaphor of ICTs is insufficient since many of today's ICTs are a complex socio-technical assemblage that involve different aspects like hardware, software, people, techniques, support resources and information resources (Kling et al, 2000). It has also been emphasized that the view you have about something will determine how you use it and the impact it will have. Adopting the tool view of ICTs and using them as such will produce little impact in community change endeavors like poverty reduction (Sein and Harindranath, 2004).

Many view ICTs as tools (to accomplish and end) even when they refer to complex arrangements or varied equipment and social practices, like the World Wide Web or airline reservation systems (Kling et al, 2000). The tool metaphor is in reality too simple a metaphor since many systems are composed of unique configurations and assemblages of components such as workstations, network and Internet protocol, gateways, routers, servers, printers and so on. Kling et al (2000) further point out that the conventional tool model tends to both underestimate the costs and complexities of computerization and overestimate the generalization of applications from one setting to another. Without appreciating the distinctive socio-technical configurations of ICT, it is difficult to understand the repercussions of computerization in specific settings. When this is not done in a complex socio-technical environment found in development or poverty

reduction interventions, it may be impossible to realize the benefits that would accrue from the use of ICTs.

Other approaches tend to view ICTs as 'a solution looking for a problem' and as a panacea of all kinds of problems. This comes out of the techno-centric and utopian views that see ICTs as novel technologies credited with the inbuilt ability to bring about a revolution in many spheres of society (Wade, 2002; Heeks, 2002; Hamelink, 1997). Proponents of this view argue that the characteristics/properties of these 'powerful' technologies can be utilized to reduce poverty. To give an example, this approach will tend to consider the information-processing and communication characteristics of ICTs as a means to reduce poverty.

There are some who have argued that the great emphasis of ICTs for development and poverty reduction is a replay of the modernization theories of the 1960s. Major development players have emphasized ICTs and posited that bridging the divide can solve the problem of poverty and development. This implies that they believe ICTs can enable sustainable socioeconomic development (and poverty reduction) by channeling knowledge from the Western nations to the developing world. This shows their support for the modernization theory of knowledge from the West being equated with socioeconomic development in the developing world (Nulens, 2003).

A fourth approach has been the way poverty is conceived or viewed. While some conceptualize poverty as lack of income (e.g. the poverty line of living on less that $ 1 a day), others have viewed poverty as lack of basic needs like food, water, health, shelter. For others, poverty is caused by corruption, bad governance and lack of rights (UN, 2004). In all these, the recommended solution has been one that directly addresses the perceived cause of poverty with the ICTs. This takes the form of, say, ways that ICTs can be used to accelerate growth which will lead to more wealth resulting in more people escaping poverty. Where poverty has been conceptualized as lack of basic needs, the solution proposed for reducing this perspective of poverty using ICTs is one where ICTs will give the poor access to information to enable them meet their basic needs. Examples given include health information (to enable one avoid preventable sicknesses or where to get treatment), agricultural extension information (to assist farmers get better yields), rights information and e-government systems for more transparent governance, etc. The

recommended poverty reduction initiatives are hence those that provide this information. The trend has therefore been to quickly recommend telehealth systems, e- and m-learning systems, agricultural extension systems, etc.

The last approach to consider here has been the way that poverty reduction is conceptualized. For some, poverty is a result of low economic growth and hence the solution is increasing or accelerating growth in the hope that the effects will trickle down to the poor communities. This approach therefore looks to ICTs that will facilitate high economic growth as the way that ICTs can be used for poverty reduction. While it is acknowledged that growth is needed to sustain poverty reduction, the experience of India (which had high economic growth throughout the 1990s) has demonstrated that growth sometimes has negligible effects on the poor and at times the poor actually get worse (Cord, Lopez and Page, 2003; UNDP, 1997 pp 7; UNDP, 2003 pp 80). Growth is therefore not necessarily a solution for poverty and hence any solution that proposes to use ICTs to increase growth as a solution for poverty may not ultimately help to reduce poverty.

From the above, it can be observed that there is little mention of how the poor communities/individuals will actually utilize the availed ICT solutions to improve their well-being. Further, even if the strategies selected have potential for success, there is nothing done to establish the contextual factors that either enable or constrain the utilization of ICTs for poverty reduction.

1.4 Research Question

The overall research question is:

How does the conversion of ICTs to valued basic capabilities play out in community ICT interventions?

Supplementary Research Questions

i. How do ICTs and other capability-input resources influence each other and how does this affect their conversion to capabilities?

ii. How do conversion factors influence ICTs and other capability-input resources, and how do they in turn influence the conversion factors during the conversion of ICTs to capabilities?

iii. How does conversion of ICTs to valued capabilities take place and what are the roles of the conversion factors and resources in the Conversion Process?

1.5 Scope

The research will limit itself to the investigation of the conversion of resources, commodities, goods and services to capabilities, and the role played by ICT solutions. This will be carried out for projects of poverty reduction implemented in poor communities that have ICTs as one of the major intervention technologies, using two case studies from Western Kenya.

1.6 Justification

The research explored how community ICTs intervention initiatives can more successfully enable people to have the freedom to do and to be what they value. The study results are clearly interesting to academics, practitioners and policy makers. For the academic, the research enhanced the existing body of knowledge on ICTs interventions in communities. Whereas a lot of research done in the area of ICTs for development and poverty reduction as evidenced by the many publications on the same, it is clear that more research still needs to be done to shed light on the conversion process. Many of the researchers have pointed out the need for exploring the contextual factors, circumstances and conditions that will bring about more positive results (Heeks, 2009; Zheng, 2009, McNamara, 2003; Klein, 2009). It is thus clear that the body of knowledge requires additions and enrichment.

When the conversion process is clear, and the way factors and contextual circumstances interact and influence the conversion is known, the practitioners will benefit by being clear on the design and implementation of ICT community interventions, leading to more

success. By understanding better the factors and resources that would enable or hinder the conversion process, the designs will take on board this knowledge, leading to more effective designs. Finally, the funding, design and implementation, and their funding are affected by the policies of governments, donors and development organizations. The results of this research will influence policy in this area, especially on the enablers and constraints on the conversion process. This will inform the policy makers and enable them to make policies that will be more suited to lead their support for interventions and projects in this domain.

1.7 Chapter Summary

We hereby briefly outline what the other chapters will entail. Chapter two reviews the existing theory, knowledge and research that informed the study. This includes ICTs definitions and perspectives, perspectives of poverty and poverty reduction and the way the Capability Approach conceptualizes poverty and poverty reduction. The chapter ends by formulating a framework that informed this research. Chapter three looks at the methodology that was utilised in this research. It gives the research philosophy, research design, data collection methods and analysis. Chapter four describes the cases that were utilized for this study. In it we find the situating of the cases and the conceptualization, implementation of the projects and people involved. Chapter five outlines the findings and the analysis of the cases. Finally, chapter six gives a summary of the achievements, conclusion, contribution to methodology, theory and practice and conclusion. It ends up by outlining the policy implications of the research and recommendations for further research.

2. THEORETICAL FOUNDATIONS

2.1 Introduction

This chapter seeks to review the theoretical background that informs this inquiry. It does it by looking at the different aspects of the poverty reduction process that involves the poor achieving what they value to do or to be through utilizing ICTs and other resources. It begins by reviewing ICTs definitions and perspectives that informed the definition that informed this research (see Section 2.2). Because the research is about the conversion of ICTs to things that the poor value to be or to do, we also explore various aspects of the poor, poverty and poverty reduction (see Section 2.3). We review who the poor are, where they live and why they are poor. Section 2.4 reviews the definition and theoretical underpinnings of the Capability Approach (CA) and the way it addresses poverty and poverty reduction. The next few section (Section 2.5) then address the issue of poverty reduction. We look at the reasons why the poor descend into poverty, why they cannot escape from poverty and end with various approaches to poverty reduction. We also review and critique ICT-for-poverty reduction theory and practice in Section 2.6. Section 2.7 traces the development of the framework that informed this research.

2.2 Information and Communications Technologies (ICTs)

While this research seeks to enquire how Information and Communication Technologies (ICTs) can make a contribution towards poverty reduction in developing countries, it has been observed that there lacks agreement on what constitutes ICTs. Various actors, especially donors that support ICT-for-development (ICT4D) initiatives in developing countries have failed to agree on one common view of ICTs. According to the Asian-Pacific Development Information Program (APDIP) of the UNDP:

> There is little informed discussion on what ICTs actually are; how they

are evolving and converging, where they might be going and what the implications are for their further use in poverty reduction… (Harris, 2005)

McNamara (2003) advocates that in analyzing the potential of ICTs to promote poverty reduction, the first step should be to clarify what is meant by ICTs, what should be included in our understanding of ICTs and what it is about ICTs that seem to make them valuable tools of poverty reduction and development.

2.2.1 Definitions

ICTs can be thought of as information-handling tools — a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' tools such as of radio, television and telephone, as well as the 'new' ICTs of computers, satellite and wireless technology and the Internet (APDP, 2005 pp. 6; Harris, 2004; Greenberg, 2005; Marker, McNamara and Wallace,2002). This sees various technologies for producing, storing, distributing and exchanging information, and differentiates between 'old' and 'new' ICTs. Gerster and Zimmerman (2003) in attempting to define ICTs say that three different approaches can be identified: a *technical* one (i.e. the production and provision side); a *content* based approach (referring to the industries and organizations that create the information); and the *user* side (focusing on diffusion and utilization). On the difference between 'old' and 'new' ICTs, they point out the characteristics of the new ICTs, namely: interactivity, permanent availability, global reach and reduced costs. Depending on the context, some people tend to emphasize on the information processing aspects or the communication aspects of the technology (Heeks, 1999; Curtain, 2004).

In the process of setting out the definitions of the various sectors of the ICT sector, OECD came up with a framework that considers both the supply side and the demand side and identified three important sectors that require attention. These are the ICT infrastructure, the ICT products and the information and content sectors, besides thinking about ICTs in a wider context (OECD 2005). It was agreed that a definition of the ICT sector would be a combination of manufacturing and services industries whose products capture, transmit or display data and information electronically. The ICT goods can broadly be categorized as: telecommunications equipment, computer and related

equipment, electronic components, audio and video equipment and other ICT goods. OECD has also defined the ICT 'content sector' as the industries which produce information content products.

In summary, ICTs can be said to be a combination of information processing systems [embedded within social systems] with communications technology, both of which are electronic. These technologies can be categorized as old ICTs (that were analogue-based, mainly one-directional and local or national) and new ICTs (that are digital in nature, interactive, permanently available and global). The products can also be subdivided between infrastructure, goods and information content.

2.2.2 ICT Perspectives

When we look at the way that different organizations and development players have defined and approached ICTs, especially in reference to their use for development and poverty reduction strategies, a number of perspectives come to mind. We explored some of these perspectives to get different flavors of dealing with ICTs. This was considered important because as Sein and Harindranath (2004) have stated and shown, the way ICTs are viewed, together with the way they are used, will influence the impact they will have for developmental purposes.

2.2.2.1 Technocentric

Various actors have over the years credited ICTs with the ability to enable Social economic development. There are a number of views of ICTs that inform this paradigm of looking at ICTs. The first one is the *techno-centric* perspective of ICTs that see them as representing a revolutionary force that can fundamentally transform societies and individual lives. This states that the "digital revolution" marks the passage of world history into a post-industrial age, where the emerging society will be characterized by more effective healthcare, better education, more information and diversity of culture. This techno-centric perspective assumes a 'discontinuity view' that emphasizes a discontinuity of the historical process with the "digital revolution" causing a social discontinuity.

There are opposing views on the impact of ICTs based on the techno-centric perspective. One side proposes a "utopian" view that looks at ICTs in such terms as "new

civilization", "information revolution" or "knowledge society", reinforcing theory of historical discontinuity. In this view, new social values, new social relations, will emerge and there will be widespread access to the crucial resource of information, where radical changes in economics, politics, and culture are forecasted (Hamelink, 1997). The other techno-centric axis is the "dystopian" view. Dystopian adherents forecast that at the economic level there will be a perpetuation of the capitalist mode of production, with a further refinement of managerial control over production processes, with most countries experiencing massive job displacement and de-skilling. As for politics, they see a scenario where a pseudo-democracy will emerge, allowing people to participate in marginal decisions only, ICTs enabling governments to exercise surveillance over their citizens more effectively than before. Finally for the dystopian, cultural developments will be characterized by the play of antagonistic tendencies: one toward a forceful cultural globalization (homogenizing all ways of life in the mould of global 'McDonaldization'), and another toward an aggressive cultural 'tribalization' (fragmenting cultural communities into fundamentalist cells with little or no understanding of different tribes).

The techno-centric view is criticized for ignoring the social context of the origins of ICTs and proceeding as if they originate in socio-economic vacuum, thus failing to see the institutional context in which the technology will operate in (Hamelink, 1997).

Heeks (2002) points out that the views on ICTs and development can be placed in a continuum, from the optimists, who associate the ICTs with positive impacts like wealth creation and improved services, while the pessimists associate them with job losses and alienation. He also describes another continuum of cause-impacts, from the technology determinists who believe that the impacts of ICTs are caused principally by the features of technology, while the social determinists believe that it is the human actions that determine the impacts of ICTs. He advocates a pragmatic view of ICT where the impact will depend on the context while people will play a great part in determining the impact of the technology.

Wade (2002) argues that even though ICTs can be used to help raise economic returns to investment, they are being portrayed in the development community as if they can leapfrog the more familiar development problems. He goes on to point out that the ICT-

for-development campaign rests on the assumption that ICTs have some innate quality that enables them to somehow go over institutional obstacles and the deficiencies of resources on the ground, provided that the supply-side components (e.g. trained computer), technicians are available.

2.2.2.2 Social Shaping of Technology (SST)

To counter the techno-centric perspective and get a more balanced view of the nature of ICTs, we interrogated the process of innovation and development proposed by the *Social Shaping of Technology* (SST). In contrast to the techno-centric tradition that only considered the social adjustments required by technology progress, SST has posited that technological change is patterned by conditions of its creation and use rather than developing solely according to an inner technical logic (Williams & Edge, 2001). SST goes beyond the social determinism notion of perceiving technology as reflecting a single rationality such as an economic imperative. It proposes that technology emerges not just from a single social determinant or through the unfolding of a predetermined technical logic, but that innovation can be understood as a 'garden of forking paths', whereby every stage of the design and implementation involves choices (conscious or unconscious) of different technical options, with the actual options selected depending on social, as well as technical factors. These choices shape the content of artifacts and direction (or trajectory) of innovation programs, resulting in many potential technological outcomes with differing implications for society as a whole and particular groups within it (Williams & Edge, 2001).

On innovation, unlike the linear models of innovation which presented innovation as involving a one-way flow of information, ideas and solutions from basic science, through research and development (R&D), to production and the diffusion of stable artifacts through the market to consumers (Williams & Edge, 1996), SST proposes an alternative 'interactive' model of technological development as a 'spiraling' rather than a linear process, where it is proposed that crucial innovations take place in the implementation and use of technology as well as at its design stage, providing important feedback that helps shape future rounds of technological change.

SST Research on the political, economic, and social forces underlying the developments of new technology policy has highlighted the fact that the creation of a new technology often involves the building of a 'socio-technical constituency,' (Molina, 1989) which refers to the alliances of individuals and organizations involved – such as suppliers firms, technologists, and potential users – with their technical knowledge and other resources, with the values and interests of participants in its constituency underpinning the final shape and form of a new technology (Williams & Edge, 2001).

2.2.2.3 Technology as Cultural Artefacts

One of the views that emphasizes the importance of 'social dimensions' of technology looks at technology as embodying the various social factors involved in its design and development, such that the resulting material form of the technology reflects the social circumstances of development. In this view, technology can be thought of as 'congealed social relations' – a frozen assemblage of the practices, assumptions, beliefs, languages and other factors involved in its design and manufacture (Woolgar, 2001). This version suggests that the social relations which are built into the technology have consequences for subsequent usage. Technology is thus conceptualized as representing a kind of 'social order', represented by the linking together of sets of social relations (Latour, 1991). Technology in this view is regarded as a cultural artifact or system of artifacts which provides for certain, often new, ways of acting and interrelating. The proponents of this view have used technography (the social-scientific study of technical settings using the ethnography method). According to Woolgar (2001) technography can be summarized by the slogan '*technology is society made durable*' because it argues that a particular fixed version of social relations as the basis for action is '*frozen in material form'* by the use of particular technology. In this way of looking at technology, users of a particular technology confront and respond to the social relations embodied within it, such that they experience the effects of the material artifact as far more immediately compelling than any mere interpretation or description.

When the technology is finally deployed, the actual users are effectively confronted by, and asked to engage with 'configured users' – the concretized preconceptions about themselves (Woolgar, 1993). Technography, by emphasizing the social relations between

products and consumers, enables the 'impact', 'success', 'failure', and other outcomes of the use of a technology to be understood in terms of the extent to which users are willing or able to conform to – and in terms of the costs involved in challenging – the configured preconceptions embodied in the technology (Woolgar, 2001).

From the arguments presented above, it is important; to not only consider the community of social relations built into the technology but also the possible interpretations of the technology by the user. ICTs already have certain preferred meanings written into them by the producers. Granted the users are not aware of the configured preconceptions built into the technology, they will still confronts and engage the 'user' already built into the technology. In confronting an engaging the 'user' and 'user relations' built into the technology, it must be recognized that the actual user may not recognize the 'user' and may interpret the relations in ways that are different. This brings about what Heeks (2009) calls design-reality gaps that limits the usability of the technologies. At the interaction level, when designers of the technologies do not take on board the target users and their social relations, the results will be gulfs of execution and evaluation (Norman, 1988) with resultant usability problems, poor user experience and satisfaction. The gulf of execution refers to the distance between the users' goals and the means of achieving them through the system, while the gulf of evaluation refers to the distance between the system's behaviour and the users' goals. This then emphasizes the importance of engaging the poor during conception, design, development and implementation to ensure the ICTs better serve the user.

2.2.2.4 Social Informatics

The Social Informatics perspective highlights the fact that ICTs do not exist in social or technological isolation but their cultural and institutional contexts influence the ways in which they are developed, the kinds of workable configurations that are proposed, how they are implemented and used and the range of consequences that occur for organizations and other social groupings (Kling et al, 2000). As for structure, integrated ICTs are characterized as configurational technology (Fleck, 1994). This is because the needs of organizations and workgroups may not necessarily be met by standard applications; firms may be forced to select and link together a variety of standard components from different suppliers, which may result in a complex array of

standardized and customized automation elements which may well be supplied by a range of suppliers and groups within or without the firm (Williams and Edge, 1996). This leads to such networks being used differently with different consequences in different organizations.

Kling et al (ibid) go on to present specific ICTs as a socio-technical network that brings together diverse resources including

- people in various roles and relationships with each other and with other system elements;
- hardware (computer mainframes, workstations, peripherals, telecommunications equipment);
- software (operating systems, utilities and application programs);
- techniques (management science models, voting schemes);
- support resources (training/support/help); and
- information structures (content and content providers, rules/norms/regulations, such as those that authorize people to use systems and information in specific ways, access controls)

They then go on to show that the different elements above are not simply a static list, but are interrelated within a matrix of social and technical dependencies which he refers to as the 'web of computing,' and goes on to argue that the socio-technical model has substantial repercussions for understanding how ICTS are actually used. If two organizations acquire a similar set of ICT equipment they will most likely develop different socio-technical "ICT systems."

Kling et al (2000) summarized consequences of ICT use both at organizational and societal level as identified through Social Informatics research. These include the fact that ICTs:

- have both the communicative and the computational roles;
- have temporal and spatial dimensions of ICT consequences
- tend to control users after they have been implemented and institutionalized (see Barley, 1986; Kling and Iacono, 1988).

- enable and constrain social actions and social relationships (see Pino and Mora, 1998; Davenport, 1998)),
- will be interpreted and used differently by different people *(*see Kling, 1980, 1987; Orlikowski, 1993; Newell, Scarbrough, Swan and Hislop, 1998);
- will have important political consequences (see Sproull and Kiesler, 1991; Danziger, Dutton, Kling & Kraemaer, 1982; Markus, 1981),
- can be bring about negative consequences for some stakeholders (see Davenport, 1988; Grower, 1999; Nelson, 1999; Markus 1994; Danziger, Dutton, Kling & Kraemer, 1982; Kling, 1980; Kling, 1983; Markus, 1981)
- rarely cause social transformations;

On last point, it is worth noting that though the technocentric perspective largely influenced the narrative of the effects and consequences of ICTs in the beginning, empirical evidence has shown that neither utopian nor dystopian is useful for explain the effect of ICTs.

Kling et al (2000) point out the fact that the social context of ICT developments and use plays a significant role in influencing the ways that people use information and technologies, thus influencing their consequences for work, organizations, and other social relationships, where social context in this case refers to a specific matrix of social relationships.

2.2.3 Adopted Definition

From the various perspectives that we have reviewed, some common aspects have come out which can be consolidated. We have mentioned that the technocentric perspective (in its various forms) has traditionally coloured the lens through which ICT-for - development and poverty reduction practitioners, policy-makers and even researchers have viewed ICTs. From these perspectives we have reviewed, it is clear that there is need to incorporate aspects of the social context into our definition and view of ICTs.

Further it is evident that the social context of the innovation and the design of technology are very important. We also need to recognize that that these technologies are not rigid but are malleable – they can be changed and shaped into different configurations. Out these perspectives reviewed, Social informatics is a more balanced view as it incorporates

most of the socio-technical aspects. We therefore adopted a definition along the social informatics line. For this research therefore ICTs are conceptualized as '*socio-technical configurable technologies consisting of a combination of electronic information processing systems and communication technology, people (in their various roles and relationships), techniques, support resources and information structures. The design and final form will be influenced by the social context and this will determine how the user will use it and the impact it will have on him/her.*

2.3 Poverty

2.3.1 The Reality of Poverty

This section looks at who the poor are and where they are found, and how poverty manifests itself. Poverty is an eyesore of the 21st century: in a world of affluence, many still experience extreme poverty where they cannot access the basic needs of life like food, shelter, clothing, medical facilities, education, and so on (Sachs, 2005).

At the end of 2015, the target date for achieving the Millennium Development Goals (MDGs,) a lot of progress has been made but some challenges still exist. The 2015 MDGs progress report paints a picture of progress on the one hand, and non-achievement on the other. Between 1990 and 2015, people living in extreme poverty (living on less than $ 1.25 a day) reduced from 1.926 Billion to 836 Million globally. Still on MDG goal one, it is estimated that by 2015, about 795 million people were undernourished globally, which translated to nearly one in nine individuals not having enough to eat: majority of them (780 million people) lived in developing countries. As for health, preliminary estimates indicate that the global under-five mortality has reduced from 90 to 43 births per 1,000 live births between 1990 and 2015. In terms of numbers, this translates to a reduction from 12.7 million in 1990 to 6 million in 2015. As for MDG goal 5, maternal mortality ratio dropped by 45 per cent worldwide between 1990 and 2013, from 380 maternal deaths per 100,000 live births to 210. In terms of absolute numbers, globally, there were an estimated 289,000 maternal deaths in 2013, equivalent to about 800 women dying each day. It is worth noting the progress has not been even globally. Majority of the people still trapped in poverty live in sub-Saharan Africa and Asia (UN, 2015).

In seeking to understand who the poor are, an observation that inequality exists between different groups, even in regions suffering from poverty. We will look at the various groups that are more vulnerable to poverty.

First, there seems to be a gender angle to poverty with the proportion of the poor being higher among the women than men. Children also suffer disproportionately and the future quality of their lives compromised by inadequate nutrition, healthcare, and education (which is especially true for girls – their primary enrolment rates are less than 50% in many African countries). Another angle to inequality is discrimination based on social position at different levels: local, regional or national. Examples of this includes marginalized castes; ethnic, racial or religious groups; refugees; indigenous people; nomads and pastoralists; and migrants, where you find disproportionately higher levels of poverty. There also those who experience discrimination within the household: female children; children in households with many children; daughters-in-law; and those with long-term or severe health problems and highly challenging disabilities and impairments. Poverty also seems to have spatial and contextual dimensions: people living in remote rural areas (especially where arable land is scarce, agricultural productivity is low and droughts, floods and environmental degradation is common); urban ghettos; and regions where prolonged violent conflict and insecurity have occurred.

Other factors delineating poverty occurrence include stage in life (e.g. older people, children and widows). Large households, households with no fit male adult (especially if the women have small children to care of or are culturally discouraged from taking paid employment) also end up being poor. There is also the landless; those who have land but have no ownership rights; those whose land that is unproductive and lies outside irrigated areas; or those with access to land that is owned by the community(or is common property) (World Bank, 1990; Narayan and Nyamwaya, 1996; UNDP, 1990; UNDP 1997; Hulme and Shepherd, 2003).

As we reflect on the reality, the definitions and the reality of poverty, some observations can be made. It is clear that poverty is still a challenge in the 21st century and needs urgent attention and more effective strategies to tackle it. We also learn that poverty incidence seems to be dependent on some characteristics of the poor, including gender, social position, stage in life and ownership of assets. Further, the poverty definition

adopted is important because it will affect the design of the policies and strategies for dealing with it, thereby influencing the results realized.

2.3.2 Defining Poverty

Krishna (2005) points out the fact that poverty exists because we '…bring it into being' – the way we see it, the definitions we provide, and the measurements that we promote configure the reality that it takes on. He further goes on to say that 'the meanings that we provide to poverty [and the] measures that we adopt lead to the policies that we implement in order to deal with poverty as we know it.' When we adopt say the definition of poverty as dollar-per-day equivalent and then consider a whole country as the unit of analysis and we then measure the percentage of people who live on say, less than $ 1 per person per day, we structure that reality of poverty.

Traditionally, it has not been the poor that have provided the reality and definitions of poverty. It has been researchers, academics, policy makers and development players that have defined poverty and determined the poverty metrics used. From their definition, they then come up with policies to alleviate the poverty "they have created." Some researchers have therefore argued for the involvement of the poor themselves in defining and describing poverty and coming up with ways of reducing poverty.

This section introduces the various perspectives of poverty, and considers criticisms of the different perspectives with a view of adopting a perspective that will be used for this research. According to the 1997 Human Development Report, "…poverty means that opportunities and choices most basic to human development are denied – to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-respect and the respect of others" (UNDP, 1997). The report gives a summary of the three common perspectives of poverty: income perspective; basic needs perspective; and capability perspective. We explore each of the perspectives below.

2.3.2.1 Income Perspective

The 1997 Human Development Report defines income poverty thus:

> … a person is poor if, and only if, her income level

is below the defined poverty line (UNDP, 1997).

An example of this perspective is the first Millennium Development Goal (MDG) target which seeks to half the number of the people in the world below the poverty line (the poverty line is defined as living on less than US $ 1.0 a day). Traditionally poverty or well-being has been looked at from the utility (happiness, desire-fulfillment, choice) or opulence (income, consumption, assets) (Hulme & Teal, 2004). In the income perspective, a person is taken to be poor if, and only if, her income level is below the defined poverty line. This is done by counting the poor (headcount), measuring income shortfalls (the income gap), allowing for income inequality among the poor (distributive sensitive measure) and allowing for the specification of vague or imprecise poverty line (fuzzy measures of poverty).

A different approach involves estimating a subjective poverty line based on qualitative perceptions of consumption adequacy among the poor. Yet another approach involves abandoning the poverty line altogether in favour of a more inclusive approach that gives positive weight to the entire distribution, e.g. the overall mean. Once the poverty line has been chosen, the next challenge is possible measurement errors which can hamper the construction of poverty profiles.

Another way of dealing with many of these problems is to allow for vagueness or imprecision in terms of defining poverty lines, for example allowing the specification of a continuous range of poverty lines and ranking the poor according to their level of disadvantage. From this information it is possible to compute the degree to which a person or group of people belong to the sub set of the poor (Clark and Hulme, 2005).

One reason why income-based or consumption-based measures of wellbeing are insufficient for considering wellbeing or poverty is that these indicators relate to the means to achieve ultimate ends rather than being the ends in themselves. Poverty is therefore not just about lack of income, granted income is an important dimension. Whereas income impoverishment is a critical deprivation since income can be used to overcome deprivation in other areas, it cannot guarantee non-deprivation in other areas. To take an example, an income rich, illiterate non-educated person may suffer from an avoidable disease because he is unable to access, read and act upon information on

prevention. Further, the rich person could suffer insecurity because of a breakdown of law and order in the community.

Poverty is therefore a multi-dimensional phenomenon: it is not only about lack of income – it is also about human deprivations in areas of health, education, participation, security, etc. Like the example above illustrates, people can be income rich, but if they are in ill health, they are poor in that dimension. Alternatively people can be healthy, but if they are not allowed to participate in social or political events because of their race and ethnicity, they are impoverished in the area of participation. All deprivations cannot and should not be reduced to a common denominator-called income poverty since income is not the sum total of human lives, and therefore cannot be the sum total of human deprivations. It is the multidimensionality of impoverishment that makes people truly deprived (Jahan & McCleery, 2005).

Another weakness of the income/consumption approach, according to Hulme and McKay (2005), is the fact that the measurements often times are done at the household level, in the process not capturing the intra-household variations, which can be substantial. This is a disadvantage especially for welfare purposes where the individual level is the right focus and it is not possible to infer the individual income/consumption from the household data due to shared income/consumption in the household. Hulme and McKay also point out the fact that income or consumption measures of well-being typically show large fluctuations over time and this is significant for the poorest, while non-monetary indicators (say adult literacy) are much less subject to fluctuations. Since as we have observed poverty is multidimensional, the income perspectives is problematic for poverty measures.

2.3.2.2 Basic Needs Perspective

Over time various researchers recognized the limitation of the poverty measurements in terms of income and commodity and as a result there was first the emphasis of 'growth and redistribution', then came the 'basic needs approach' of the 1970s and early 1980s, where basic needs were construed in terms of inputs and then outcomes (opportunities for a full life, life characteristics, etc.). In this perspective, poverty is viewed as deprivation

of material requirements for minimally acceptable fulfillment of human needs, including food, basic health, education, and other essential services.

The basic needs approach has also been criticized for the number of reasons. In 'Goods and People', Sen (1985:513-517) outlines five critiques of basic needs approaches which may be summarized as:

- basic needs are 'defined in terms of commodities' …even though the contingent nature of commodity requirements is fully acknowledged;
- 'individual commodity requirements for specific capabilities may not be independently decidable for each person, due to social interdependence;
- the basic needs approach confines attention to minima, and is useful mainly for poor countries;
- 'needs is a more passive concept than capabilities, and it is arguable that the perspective of positive freedom links with capabilities (what can the person *do*?) rather than with the fulfillment of their needs (what can be *done for* the person)';
- the basic needs approach neglects philosophical foundations – conceptions of the 'good life.'

Thus the basic needs approach has been criticized for these and other shortcomings, like the fact that though the importance of choice (for the poor) was acknowledged (and the issues of self-determination and participation included), 'it was dealt with in a piecemeal fashion' (Alkire, 2002 pp.167).

We briefly turn to the Basic Human Needs Approach (BHNA), which is a further development of the basic needs approach. The BHNA, though it deals with human needs, goes beyond the 'commodity fetish mistake' and takes into consideration the importance of achieving the full life (ibid pp.168). The objective of the BHNA is 'to provide all human beings with the opportunity for a full life' (Streeten et al, 1981, Stewart, 1989:30). The BHNA thus improved upon the basic needs approach by considering the commodities as a means to achieving a full life, and further acknowledged that the provision of these basic needs does not necessarily mean a full life since the capability to convert food, health, education, shelter, and so on, to a full life varies at the individual level, depending on the person involved.

2.3.2.3 Capability Perspective

Increasingly, there was a shift of emphasis from securing the means for eliminating poverty (e.g. employment, equitable growth, access to basic goods and services) to promoting the ends of human development (Clark and Hulme, 2005:14). This later led to the rise of Amartya Sen's Capability Approach which advocated the need to concern ourselves with the full range of human functionings and capabilities that constitute a good form of life. In the Capability Perspective, poverty represents the absence of some basic capabilities to function - a person lacking the opportunity to achieve some minimally acceptable levels of these functionings ('beings' and 'doings').

According to Sen, being able to live long, escape avoidable morbidity, be well nourished, be able to read, write and communicate and take part in literary and scientific pursuits and so forth are all examples of valuable capabilities. It is clear that poverty is a multi-dimensional phenomenon: it is not only about lack of income – it is also about human deprivations in areas of health, education, participation, security, etc. It is the multidimensionality of impoverishment that makes people truly deprived (Jahan & McCleery, 2005). In this framework, poverty is construed as basic capability failure. This new paradigm – Sen's capability approach (CA) – therefore seeks to address the shortcomings of the earlier approaches to well-being. In the approach, Sen sees development as involving the expansion of human capabilities – defined in terms of the substantive freedoms (the ability to achieve various 'doings' and 'beings') people have reason to value. This very brief treatise on 'capability poverty' was done as a way of introducing the perspectives of poverty.

The capability approach enables poverty to be defined in practical down-to-earth ways that resonate with the reality and experience of the poor in different communities and localities. This enables poverty reduction interventions to be evaluated in ways that reflect local realities, without undue abstraction and generalizations. The capability perspective is therefore a superior approach as it gives us a definition that addresses the fundamentals of poverty – the deprivations that rob the poor of the freedom to be what they value to be and to do what they valued to do, allowing us to deal with the characteristics of that deprivation, and the multidimensionality of poverty. The stability and utility of CA to inform the conceptualization and measurement of poverty reduction

is further brought out by the fact that the UNDP flagship Human Development Reports (with the related development and poverty indices) has CA as the theoretical underpinning. In UNDP's 1997 Human Development Report, poverty is defined thus:

> Poverty represents the absence of some basic capabilities to function – a person lacking the opportunity to achieve minimally acceptable levels of these functionings (UNDP, 1997).

The report went on to point out some important functionings that they utilized in their analysis:

> The functionings relevant to this analysis can vary from such physical ones as being well nourished, being adequately clothed and sheltered and avoiding preventable morbidity. To more complex social achievements such as partaking in the life of the community.

The capability approach by its very nature is deliberately incomplete (Alkire, 2002); its operationalization requires more information to be provided in the context of use. For this reason some have questioned how far the approach is operation and called for 'a good deal of further theory', with some recommending a list of capabilities that should be included (Sugden, 1993; Stewart, 1996, Nussbaum 1988). A lot of work has been done in the quest of operationalizing the capability approach in different contexts (Nussbaum, 2000, Alkire, 2002). The human development report sought to operationalize the capability approach to development by coming up with an index – the Human Development Index (HDI) that incorporated three types of deprivation: people's deprivation in life expectancy, literacy, and income for a decent living standard) (UNDP, 1990). The 1997 Human Development Report introduced the Human Poverty Index (HPI). While HDI sought to measure the progress that a community (or county) has made in attaining the three dimensions of wellbeing, HPI sought to bring together 'in a composite index the different features of deprivation in the quality of life to arrive at an aggregate judgment on the extent of poverty in a community' (UNDP, 1997 pp 17). The report acknowledges that human poverty incorporates many dimensions that either cannot be measured or were not being measured at the time. For these reasons, HPI therefore left out important dimensions of human poverty.

> Critical dimensions of human poverty excluded from the HPI … are lack of political freedom, inability to participate

> in decision- making, lack of personal security, inability to participate in the life of a community and threats to sustainability and intergenerational equity (UNDP, 1997 pp 17)

This research adopted the capability approach as the underlying theory that informed the definition of poverty, poverty reduction and the framework that guided the study. The main goal of the study was to explore the conversion of ICTs into basic capabilities. Since CA presents poverty as basic capability deprivation, an understanding of how ICTs can be converted to valued basic capabilities can thus benefit the conceptualization and design of ICT interventions that can be used to reduce poverty in the community. The research does not therefore limit itself to particular dimensions of poverty.

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2.4 The Capability Approach (CA)

2.4.1 What is the Capability Approach?

This research utilized Sen's Capability Approach (CA) as the main theory for conceptualizing poverty and poverty reduction. According to Robeyns (2005 pp 94) 'The capability approach is a broad normative framework for the evaluation and assessment of individual well-being and social arrangements, the design of policies, and proposals about social change in society.' CA can be used to evaluate aspects of people's wellbeing including inequality and poverty, both for an individual and for groups. It can also be used to design and evaluate development and poverty reduction policies by governments and non-governmental organizations (Robeyns, 2005). In Inequality Re-examined, Sen opens with this description:

> 'A person's capability to achieve functionings that he or she has reason to value provides a general approach to the evaluation of social arrangements, and this yields a particular way of viewing the assessment of equality and inequality' (Sen, 1992 pp 5)

The capability approach criticizes philosophical approaches that emphasize people's happiness or desire-fulfillment, or income, expenditure or consumption and proposes an alternative way to conceptualize well-being (e.g. justice and poverty reduction) (Alkire,

2005; Robeyns, 2005). Sen's Book, 'Development as Freedom' opens with this statement:

> 'Development can be seen, it is argued here, as a process of expanding the real freedoms that people enjoy' (Sen, 1999b pp 3).

The approach focuses on what people are able to do and to be (i.e. on their capabilities). To give an example, the capability approach fundamentally claims that the objective of justice and poverty reduction should be to expand the freedom that deprived people have to enjoy valuable beings and doings' Alkire (2005). Evaluations and policies, therefore should focus on what people are able to do and to be and on 'removing obstacles in their lives so that they have more freedom to live the kind of life that upon reflection they have reason to value' (Robeyns, 2005 pp 94). It is also worth mentioning at this juncture that the theoretical foundations of the human development paradigm come from the capability approach (Fukuda-Parr, 2003; Fukuda-Parr and Kumar, 2003).

The concept of functionings, 'reflects the various things a person may value doing or being' (Sen, 1999b pp. 75). Functionings vary from elementary ones like being adequately nourished, being free from avoidable diseases, to complex ones like being able to take part in the life of the community and having self respect. 'A person's capability refers to the alternative combinations of functionings that are feasible for her to achieve. Capability is thus a kind of freedom: the substantive freedom to achieve alternative functioning combinations (or less formally put the freedom to achieve various lifestyles' (Sen, 1999b pp 75). According to Sen, if the amount or extent of functioning vector enjoyed by a person was to be represented by a real number, then that person's actual achievement could be looked at as a '*functioning vector'* (Sen, 1999b). Capability set would thus be seen as the alternative functioning vectors that a person would choose from, or put differently, as a set of vectors of functionings that reflect the person's freedom to lead one type of life or another (Sen 1992; 1999b). The capability approach distinguishes between actual functionings and freedom to achieve. The combination of a person's functionings reflects their actual achievements, while the capability set represents the freedom to achieve – the alternative functioning combinations from which the person can choose (Sen, 1999b). The capability approach also distinguishes between realized (or achieved) functionings (what a person is actually able to do), and the

capability set of alternatives the person has (her real opportunities). A person's functionings and her capability are closely related but distinct. "A functioning is an achievement, whereas a capability is the ability to achieve. Functionings are, in a sense, more directly related to living conditions, since they *are* different aspects of living conditions. Capabilities, in contrast, are notions of freedom, in the positive sense: what real opportunities you have regarding the life you may lead" (Sen 1987:36).

The freedom that the capability approach advances is real and not potential or theoretical. Freedom concerns 'the real opportunity that we have to accomplish what we value'' (Sen, 1992 p. 31). 'It does not, therefore, include freedoms or opportunities that a person might hold theoretically or legally but that, in reality, lie well beyond their reach' (Alkire 2005 pp 121). Sen (1992 pp. 65) further clarifies that freedom includes 'a person's ability to get systematically what he would choose no matter who actually controls the levers of operation.' Another critical aspect to consider in the concept of capabilities is 'value.' By definition, capabilities are functionings that people value and have reason to value. 'Opportunities that people have reason to find horrid, or irrelevant, or cumbersome are not to be expanded' (Alkire, 2005b pp 3). Sen qualifies the prominence of choice in the approach by arguing that increases in choice *per* se do not necessarily lead to an increase in freedom. This is partly because the options added may not be the ones we value, and in part because – however valuable or not the options may be – we may lose the options to live 'a peaceful unbothered life' (Sen, 1992 pp. 63). The freedom therefore spoken of in the approach is the one to accomplish what we have reason to value. If the government introduces a service in a poor rural community – considered rich and good in certain respects – by force and coercion, this would not be 'the good life' as far as the approach is concerned. What is introduced (or given) to a person or a community must be something they value and have reason to value. The approach therefore revolutionizes the way development or poverty reduction is looked at. Development interventions or poverty reduction efforts must be things that the recipients have reason to value as opposed to external agents deciding that the thing is good for them without establishing that it is valued.

This brings us to Sen's claim that 'freedom is an irreducibly plural concept (Sen, 2002: 585).' Alkire (2005b pp 2) qualifies this by asserting that 'Some aspects of freedom relate to opportunities that people face; others to processes that they command, and the elements of valued opportunities and processes are themselves plural and diverse:'

> First, more freedom gives us more *opportunity* to achieve those things that we value, and have reason to value. This aspect of freedom is concerned primarily with our *ability to achieve*, rather than with the process through which that achievement comes about. Second, the *process* through which things happen may also be of fundamental importance in assessing freedom (Sen, 2002: 585).

Capability approach allows for consideration of 'people's actual choices, achievements and their space for personal liberty' on the one hand, and 'opportunities that are available to people which they value and have reason to value – their freedom to achieve valued outcomes, on the other' (Alkire, 2005b pp 2). Process freedoms have to do with a person's ability to exercise agency to pursue what they conceive as good. Being able to choose freely or not having others interfering in the way one lives is valuable. 'This process aspect of freedom concerns personal process concerns such as autonomy and immunity – whether the person was free to choose herself, whether others intruded or obstructed, and so on' (Sen, 2002 pp10). It also concerns 'systematic process concerns' such as rights and justice – that address 'processes that operate as general rules in the working of the society' (Sen, 2002 pp 624). Process freedoms therefore have to do with agency. Agency is defined as 'what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important' (Sen 1985, pp 203). Agency is general; it is 'not tied to any one type of aim. Agency freedom is freedom to achieve whatever the person, as a responsible agent, decides he or she should achieve' (Sen 1985 pp 204)

Agency may be exercised at the individual level, or in groups, or through democratic participation (Alkire, 2002; Kabeer, 1999). To give an example, Dreze and Sen, directly identify participation as an expression of agency, and argue that it can have intrinsic value:

> Participation also has intrinsic value for the quality of life. Indeed being able to do something not only for oneself but also for other members of the society is one of the elementary freedoms which

> people have reason to value. The popular appeal of many social movements in India confirms that this basic capability is highly valued (Dreze and Sen, 1995 pp 106).

We briefly review the exercise of agency at the community level. The capability approach, much as it advocates for agency does not explicitly advocate for participation. The argument is that participation approaches can be used (in congruence with the capability approach) as one of the approaches to mechanisms for the community to exercise agency. In his book *Development as Freedom*, Sen writes that 'The people have to be seen, in this [development as Freedom] perspective, as being actively involved – given the opportunity – in shaping their own destiny, and not just as passive recipients of the fruits of cunning development programs' (Sen, 1999:31). Participation, refers to the process of discussion, information gathering, conflict and eventual decision-making, implementation, and evaluation by the group(s) directly affected by an activity (Alkire, 2002). As a method of choice, participation is different from decision-making by committee, or by voting, or by representative democracy. While it takes time and is not appropriate or efficient for all choices, yet, according to Alkire (2002), it can be related to Sen's account by focusing on the agency of poor groups that participatory processes claim to support. Participatory initiatives support one type of agency freedom – the freedom of participants to express their views and, if consensus is reached, to act on them. According to Alkire (2002, pp 131), 'to see agency as a dimension of human development, or a functioning, or even an "outcome" gives a framework for analyzing the value of agency relative to other considerations in any particular commitment or choice. When decisions are made with public scrutiny, and/or participation, chances are that they may be more equitable, and there is more effectiveness since there is more likelihood of accurate analysis of needs. Decisions made by participatory processes may be more equitable because (if) they include the needs of the poor (Alkire, 2002). Sen argues that 'the practice of democracy gives citizens an opportunity to learn from one another, and helps society to form its values and priorities … in this sense, democracy has constructive purpose (Sen 1999:10). The example given to illustrate this is the way declining fertility rates have been much influenced by public discussion of the bad effects of high fertility rates on communities at large and on the lives of young women. The availability of new information on family, child-bearing and family planning fuelled

public discussions on family planning, and this finally led to reshaping of the values around family and child-bearing. This public discussion can be viewed as a form of participation (alkire 2002).

Alkire argues that 'free choices and their transitive effects constitute not only what a person or group or community effectively does, but also, to a degree, who they are – their identity and culture' (Alkire 2002:137). Finnis (1983:76) adds that 'choices have constitutive implications not only for individuals but for communities', in other words choices shape group identities. Alkire (ibid) further points out that development exerts force on existing practices minimally by offering an alternative practice due to the fact that the very possibility that the new practice is novel demands a re-evaluation of the status quo. Since novel practices change not only the direct paths by which people enjoy human development, they also affect the practices with which they interlock. Novel practices, innovations which become socially established and integrated into the cultural fabric, also change the identity and character of the community. The implication of this is that part of the evaluation of the novel practices that development proposes should rest not [only] on their transitive effects, but also on their intransitive effects.

On who exercises agency, Alkire (2002, pp143) points out the principle of subsidiarity that holds that 'the most local agent(s) capable of making a choice should make it'. This implies that the most local agents whose identity and well-being will be affected by a choice and who are capable of making it, should do so. Alkire (2002) introduces Beauchamp and Childress' (1994) informed choice model which they have described in such as way that it has a conceptual parallel with externally assisted poverty reduction. In this informed consent model, the development agency does not act unless the local community choose the partnership and activities with full awareness of what it is choosing. The development agency understands that whether or not it can understand the values which are at stake in the choice, it is the community which must assume responsibility for deciding prospectively which path to follow. We conclude by reiterating the central importance of agency in the capability approach and pointed out the fact that at the community level, participation can play a role to facilitate discussion

and choice. Also to note is how participation parallels some of the requirements of agency that the capability approach advocates.

The capability approach makes a distinction between the means (e.g. goods and services) on the one hand, and functionings and capabilities on the other. In thinking about how goods and services can be utilized to realize capabilities, we have to bear in mind that it is not an exchange say for money or income. For the approach, a person is interested in a good because of particular characteristics. Sen has used the bicycle to illustrate the relationship between goods (or commodities) and capabilities:

> Take a bicycle.… Having a bike gives a person the ability to move about in a certain way that he may not be able to do without the bike. So the transportation *characteristic* of the bike gives the person the *capability* of moving in a certain way (Sen, 1983 pp 153-169) .

Robeyns (2005, pp 98) had the following to say about the case of the bicycle enabling the functioning of mobility:

> '… we are not interested in a bicycle because it is an object made from certain materials with a specific shape and colour, but because it can take us to places where we want to go, and in a faster way than if we were walking. These characteristics of a good enable a functioning. In our example, the bicycle enables the functioning of mobility, to be able to move oneself freely and more rapidly than walking.

The bicycle enable one to get the functioning of moving from one place to another. It is however the characteristic of transportation that is of interest here; other characteristics may not be as important unless they influence the mobility characteristic. For a person to be able to use the bike to move from one place to the other, they need to be physically able to, they also need to have the knowhow and the skill to ride a bike. If a person has never learned how to ride a bicycle or they are physically disabled, they cannot utilize the mobility characteristic of the bicycle and therefore are not able to get the functioning of mobility. We can say that they are unable to convert the mobility characteristic of the bicycle to the functioning of mobility, which they may well have reason to value. The ability to get the functioning therefore is dependent upon the person being able to utilize the characteristic of the good. This ability to utilize the characteristic is called a conversion factor.

The relationship between a good and the achievement of certain beings and doings is influenced by three groups of conversion factors: personal, social and environmental (Sen, 1992; Robeyns, 2005; Zeng, 2009). Personal conversion factors will affect the way a person can convert the characteristic of a commodity into a functioning. Personal conversion factors include mental conditions (e.g. intelligence), physical conditions (health, strength, physical abilities), reading skills, metabolism, gender, among others. To give an example, when there is a job offer and a person seeks to get the job and work (a valued functioning), she will not be able to utilize the opportunity to get the work unless she has the skills required to do the work. With the skill, she is able to get the job and do the work. Social conversion factors consist of certain characteristics of social settings, such as social norms (e.g. role of women, rules of behavior, materialism, religion, etc.), social institutions (e.g. rule of law, political rights, public policies), and power structure (e.g. hierarchy, politics). To give an example, the head of the family may die and is survived by a non-employed widow and young children and the only resource left is the family land. The widow realizes the land requires ploughing, seeds, fertilizer and irrigation and she has no financial resources. She may opt to take a credit facility with a financial institution to enable her utilize the land to feed her family. To access the credit facility, the financial institution may require her to give the title deed of the family land as security (institutional settings/ pubic policies). If she comes from a community where women cannot inherit land and therefore cannot get the title deed (social norms) she will not be able to get the facility and utilize it to get the requirements to feed her family. In this scenario, the social factors (social norms, and institutional setting) constrain her from converting the available resource (family land) to the valued functioning (feeding the family).

During conversion, there are situations where conversion factors interact to enable or deny conversion. To give an example, take the person we saw earlier that decides to seize a job on offer to achieve her valued functioning of work. If she has the skills, but comes from a society where women are not allowed to work (gender roles - a social factor), she will not be able to utilize the opportunity to work. This is a case where the social conversion factor influences the personal conversion factor during the conversion.

Environmental factors include climate, geography, and infrastructure, among others. For an example, we can think of a rural farmer that has planted cabbages and tomatoes with an intention of marketing the harvest to educate his children. At harvest time, there appears unexpected heavy rains that last longer than usual. Since the roads are not all-weather, they become impassable during the long rains, the produce fails to get to the market and all of it rots. The farmer therefore fails to get the financial resources necessary to take his children to school. This means he cannot convert the natural resources (land) to the valued functioning (his children being educated).

The capability approach therefore distinguishes between the means, such as goods and services on the one hand, and functionings and capabilities on the other. It is instructive to note that means are not limited to goods and services; other inputs in the expansion of capabilities include social institutions broadly defined. These include personal and socio-environmental conversion factors of resources into functionings and the social and institutional context that affect the conversion factors and the capability set directly (Robeyns, 2005).

There are many researchers and writers that have worked on the capability approach. Amartya Sen[1] (the 1996 Nobel Laureate for Economics) pioneered the Capability Approach in the 1980s. While many scholars and researchers have continued to expand the CA knowledge base, Martha Nussbaum[2] has been especially instrumental in extending the CA. This research borrowed heavily from the explication of CA by Sen as expounded by Alkire (2002, 2005a, 2005b, 2005c), but supplemented the knowledge with the works of Robeyns, Zheng, and Klein, among others.

Whereas Sen's and Nussbaum's approaches are closely related, they however differ on a number of issues. We begin by looking at the goals of these two main scholars as they developed the theory. Nussbaum aim was to develop 'a partial theory of justice ...Thus, Nussbaum enters the capability approach from a perspective of moral–legal–political

[1] For the main texts in developing the capability approach see Sen (1982, 1884, 1985, 1992, 1995, 1996a, 1996b, 1999, 2001)

[2] For the main texts of Nussbaum's work in extending the CA, see Nussbaum (1995, 1998, 2000, 1993, 1995)

philosophy …' 'Sen was doing some much more applied work on poverty and destitution in developing countries, in which he found empirical support for a focus on what people can do and could be instead of the measures that were more dominant in development economics in the early 1980s' (Robeyns, 2005 pp 103,104). The way that they conceptualize capabilities differ. Whereas Sen presents capabilities as the real or effective opportunity, Nussbaum's notion pays more attention to people's skills and personality traits as aspects of capabilities. Secondly, Nussbaum develops three categories of capabilities (basic, internal, and combined) (Robeyns, 2005). Thirdly, Nussbaum proposes a concrete list of capabilities, which is composed of 10 categories (Nussbaum, 2000, 2003a). Nussbaum's work targets developing constitutional principles that citizens have a right to demand from their government (Nussbaum, 2003a), while Sen's capability approach has a wider scope.

On the question of specifying a list of capabilities, Sen (2004b) argues against endorsing a predetermined list, and instead recommends a contextualized democratic process for selecting the capabilities since they will be used for different purposes in different contexts. Sen 'stresses that public discussion and reasoning can lead to a better understanding of the value and role of specific capabilities.' This research looks at the conversion of ICTs in community interventions that have poverty reduction as a goal. Even though – as Sen (1981 pp 17) would put it – 'there is an irreducible core of absolute deprivation in our idea of poverty … starvations, malnutrition …' yet poverty will always be framed by the context. 'It may be that the case that poverty …is always defined according to the conventions of the society in which it occurs' (Sen, 1981 pp 398). In different societies, the view of poverty may have differences. If poverty is viewed as basic capability failure, and capability is the freedom to achieve functionings that one values and has reason to value, then the view of valuable basic capabilities may differ in different communities. For this reason, it would not serve to start off from a predetermine list; it would serve the purpose better if we determined basic capabilities in a particular community. Secondly, since we are dealing with the conversion of ICTs interventions to valued capabilities, those capabilities must be valued – they must be from the people and hence the importance of the agent being the one to choose the capability they value. If we have a list which is selected a priori, we may then be obligated to take

one of the basic capabilities on the list and design strategies for realizing it using ICTs. The question however will be; will it be valuable to the community we are seeking to serve, and will the community therefore benefit from it? Due to the reasons above, this research chose to follow Sen's rendering of the capability approach.

Another term that requires defining is basic capabilities. Basic capabilities are a subset of all capabilities and they refer to the freedom to do some things that are necessary for survival and to avoid poverty. According to Sen(1987 pp 109), 'the relevance of basic capabilities lies ''not so much in ranking living standards, but in deciding on a cut-off point for the purpose of assessing poverty and deprivation.' Whereas therefore the notion of capabilities covers a wide range, basic capabilities have to do with the real opportunity (or freedom) to avoid poverty (or more specifically a dimension of poverty). In another instance, Sen describes poverty as 'basic capability failure', that is the inability of individuals and communities to choose some valuable doings and beings which are basic to human life. Alkire (2002) considers the question of operationalizing the capability approach to address the question of meeting basic human needs. Alkire (ibid) suggests that we should view this as the capability to meet basic needs. Alkire then considers that question of 'human needs' and uses Wiggins (1998) account to establish that basic needs are a subset of absolute needs and entrenched needs. According to Alkire (ibid pp 159), 'Absolute needs satisfiers are a prerequisite for living an unharmed life', while a need is entrenched if the lack of such a need will lead to a person being harmed within a certain period in all cases and circumstances (socio-political-environmental or other context). Alkire develops this further and states that 'basic needs could be described relative to the substantive functionings that will be harmed if the basic need is unmet, … and the basic needs capabilities will comprise of a band of functionings which are expressed at a sufficient level of generality to indicate basic needs' (ibid, pp 159). She concludes by stating that 'A basic capability is a capability to enjoy a functioning that is defined at a general level and refers to a basic need, in other words, a capability to meet a basic need … the set of basic capabilities might be thought of as capabilities to meet basic human needs' (ibid, pp 163).

A number of criticisms have been leveled against the capability approach. The have included the areas of individualism, groups and social structures (Gore, 1997; Robeyns, 2000, pp. 16–18;
2003b; Deneulin and Stewart, 2002; Sen, 2002b; Stewart, 2004). The criticisms can be summarized into three main concerns (Robeyns, 2005 pp : 107):

a. The capability approach is too individualistic. It does not consider individuals as part of their social environment, as socially embedded and connected to others. Instead, the capability approach works with a notion of atomised individuals.
b. The capability approach does not pay sufficient attention to groups.
c. The capability approach does not pay sufficient attention to social structures.

We briefly review each of the criticism below.

a. The capability approach is too individualistic

To address this criticism, Robeyns (2005) begins by considering different conceptualizations of individualism: ethical individualism on the one hand and methodological and ontological individualism on the other. Ethical individualism postulates that 'that individuals, and only
individuals, are the units of moral concern …when evaluating different states of social affairs, we are only interested in the (direct and indirect) effects of those states on individuals' (ibid, pp 108). On methodological and ontological individualism Robeyns stated the following:

> Methodological individualism is often the term used for … the view that everything can be explained by reference to individuals and their properties only … the doctrine that all social phenomena can in principle be explained in terms of individuals and their properties. (…) In contrast, ontological individualism states that only individuals and their properties exist, and that all social entities and properties can be identified by reducing them to individuals and their properties. In this view, society is built up from individuals only, and hence is nothing more than the sum of individuals and their properties.

It is clear from the above that following ethical individualism is not at all against an understanding that recognizes the connections between people, their social relations, and their social embedment. Social policy that focuses on groups and communities can be compatible with ethical individualism. The capability approach works with ethical

individualism, but does not rely on ontological individualism. The capability approach accounts for social relations and the constraints and opportunities of societal structures and institutions on individuals by recognizing the social and environmental factor that influence the conversion of commodities into functionings. It also does the same by distinguishing functionings from capabilities and recognizing that choosing functioings from the capability set required an act of choice. It is clear that the capability approach is not at all methodologically or ontologically individualistic. This is more so because it has been used to analyze processes that are clearly collective, for instance Sen's analysis of households as sites of cooperative conflict (Sen 1990a).

b. The capability approach does not pay sufficient attention to groups

One version of this criticism claims that the capability approach cannot pay sufficient attention to groups, while the other states that the existing research and scholarship does not pay sufficient attention to groups. On the first one, the evidence clearly contradicts it because a lot research exists that looks at the average capabilities of one group compared with another; for example, women and men (Kynch and Sen, 1983; Sen, 1995; Nussbaum, 2000; Robeyns, 2003a). Further, capability theorists have written on the importance of groups for people's wellbeing, like the discussion of the women's collectives in India (Nussbaum, 1998; 2000), capabilities related to community membership (Nussbaum, 2000; Alkire, 2002; Robeyns, 2003b) The UNDP (1995, 2004) has produced Human Development Reports on both gender and culture, and thus also research based on the capability approach can focus on groups.

On the claim that there is insufficient capability approach literature on groups, whereas some theorists have emphasized on the rationality of human beings their ability to resist moral pressure from groups (Sen, 1999, 2000), there exists other writers on the capability approach who pay much more attention to the influence of social norms and other group-based processes on our choices and, ultimately, on our well-being (Alkire, 2002; Nussbaum, 2000; Iversen, 2003; Robeyns, 2003b; Kabeer, 1999; Kleine, 2009). It is thus evident that the capability approach is able and does take the importance of groups fully into account (Robeyns, 2005).

c. The capability approach does not pay sufficient attention to social structures

As Figure 2.2 shows, social structures and institutions can (and generally do) have an important effect on people's capability sets. Further, policy and social change influences the means to the capabilities and not capabilities directly (Robeyns, 2005). For this reason, it is important to know the social determinants of the relevant capabilities, as only those determinants (including social structures and institutions) can be changed. It is thus clear that the capability approach takes into account these structures in its conceptual framework, although clearly appreciating that these are the means and not the ends of well-being.

2.4.2 Poverty and the Capability Approach

It has being argued above that individual advantage should be judged in terms of the capabilities that a person has, that is the substantive freedoms he or she enjoys to lead the kind of life he or she has reason to value. This implies that 'poverty must be seen as the deprivation of basic capabilities rather than lowness of income, (which in the past) has been the standard criterion of identification of poverty' (Sen, 2001 pp.87). This does not however deny that low income is one of the major causes of poverty since lack of income can be a principle reason for a person's capability deprivation. According to Sen, there is need to concentrate on the capability approach to poverty because:

- poverty can be sensibly identified in terms of capability deprivation; the approach concentrates on deprivation that are intrinsically important (unlike low income which is only instrumentally significant);
- there are influences on capability deprivation – and thus on real poverty – other than lowness of income (income is not the only instrument in generating capabilities);
- the instrumental relationship between different low income and low capabilities is variable between different communities and even between different families and different individuals (the impact of income on capabilities is contingent and conditional).

The capability approach assists in understanding poverty and deprivation by shifting attention away from the means (e.g. income) to ends that people have reason to pursue, and thus to the freedom to be able to satisfy these ends. Finally, some capability deprivations endemic in some developing countries, like premature mortality, undernourishment and illiteracy, may need more than income to address. What is emerging is the fact that unlike in the past where the emphasis of poverty and poverty reduction has been on income, it is more instructive to look at poverty as capability deprivation. "Poverty can therefore be seen as 'basic capability failure', that is as the inability of individuals and communities to choose some valuable 'doings and beings' which are basic to human life" (Alkire, 2005 pp. 156). Another way of looking at poverty is 'an *absolute inability* to pursue certain valuable functionings' (Ibid pp. 156). This research thus viewed poverty as basic capability failure. Poverty reduction therefore entails finding ways to mitigate capability deprivation or failure.

2.5 Poverty Reduction

This section considers the reasons why people are poor and various ways of reducing poverty. This is done with a view to identifying aspects of poverty reduction that can be useful as we attempt to come up with a framework for poverty reduction.

2.5.1 Reasons for Descending into Poverty

Empirical findings from different regions of the world (Narayan and Nyamwaya, 1996; Krishna, 2005), helps us identify cross-cutting reasons for falling into poverty. These include:

- ill-health and high health care expenses: when members of a family become sick, the rest of the family put together their assets and many times borrow to get medical care for the person.
- marriage and death feasts: families put together their assets and borrow for these feasts, often leaving them poor.
- high-interest private debt: often times borrowed to pay for things the family values like wedding and death feasts and medical expenses, etc.;

- soil erosion, land division, and drought;
- intergenerational poverty: people 'inherited' poverty from poor parents because the poor parents could not take them to school, nor leave any land as an inheritance (those who do leave very little land of poor quality), leading to subsequent generations getting poorer.
- Shocks: natural (climatic) shocks like drought, famine, flooding, cyclones, desertification, reduced rainfall, poor soil quality (for people living in the rural areas that are involved in small scale farming); crop/livestock failure due to natural shocks diseases; chronic or terminal illness or death of a household head; armed conflict, civil war, conditions of lawlessness in failed states and dictatorships, and economic shocks.
- Trends: include population trends, resource trends (including conflict), national/international economic trends (e.g. declining prices of primary goods, trade barriers to certain regions, subsidy by countries leading to very low prices), trends in governance (including politics), and technological trends.
- Seasonality: seasonality of prices, of production, of health, and of employment opportunities.
- Assets: possession of or access to liquid assets (disposable items like jewelry, livestock or other assets that people can draw upon from social networks or the public purse) in the event of shocks, trends and seasonality. Poor countries have no effective public social protection arrangements, leaving people to rely on social networks and private liquid assets (Hulme and Shepherd, 2003).

One observation from the list above is that people will go to great lengths to get what they value, for instance wedding and death feasts, even if they cannot afford them.. It appears people are ready to spend themselves into poverty (say through unaffordable private debt they can ill afford) in order to realize what they consider valuable to them. Further, if the means that enable them to achieve their valued functioning is attacked, reduced or removed, they will become poor. We can thus see the connection between poverty and value. It would seem therefore that any poverty reduction initiatives must be anchored in value: it must seek to expand the ability the poor have to pursue or achieve

what they have reason to value. The initiatives ought to have as a goal the expansion of functioning opportunities that the poor have reason to value.

2.5.2 Different Approaches to Poverty Reduction

Two International organizations that have openly committed themselves to tackling poverty are the United Nations Development (UNDP) and the World Bank. They invest lots of resources to research and programs whose goal is poverty reduction and development. Each of the produces a yearly publication the progress of human development, poverty reduction and social economic development around the world and give commentaries and policy recommendations on ways countries can tackle these concerns. These are the Human Development Report of UNDP and World Development Report of the World Bank. We sampled a report each that specifically dealt with poverty reduction.

The title of the 1997 Human Development Report was 'Human Development to eradicate poverty (UNDP, 1997).' The approach of UNDP seemed to point to the need for empowerment of the poor so that they can participate in decisions that affect them and enable them to build their strengths and assets. This is broken down to involve policies that enable the poor access material, financial and social assets that can assist them to escape destitution. It also recommends broad-based support for pro-poor growth, markets and policies.

Similarly, the World Bank's 2000/2001 World Development Report had 'Attacking Poverty' as its theme (World Bank, 2000. In the report the World Bank advocated for the empowerment of the poor which involved coming up with policies that address the interaction of political, social and other institutional processes so that they are responsive to the needs of and are accountable to the poor. They also talked of creating opportunities for the poor including infrastructure, markets and building skills for the poor. There was also the issue of security from shocks, natural disasters and ill health. This pointed to the need for creating an environment that the poor need to enable them choose and achieve what they value to be and to do. The two organizations agree on the need for empowering the poor by availing opportunities and putting in place policies that address the social and political environment that constrain the poor from doing and becoming what they value.

2.5.2.1 Growth and Poverty Reduction.

Whereas it is agreed that for sustained poverty reduction there has to be growth, there has been an observation that in many cases little (if not negligible) of the benefits of growth trickle down to the poor (Cord, Lopez and Page, 2003) There are even times when the poor actually get worse (UNDP, 1997 pp. 7; UNDP, 2003 pp. 80). An example is the case of India, which experienced a consistently high growth in the 1990s and the early 2000s, but many poor people still face with many challenges, including basic needs of life like clean water, sufficient power supply, ability to earn wages as laborers, ability to provide the basics for the family, decent health services, etc.

UNDP (2003) points out the fact that though sustained economic growth can help reduce poverty by increasing household incomes of the poor and hence contributing to reducing income poverty, the 'gains can be dissipated if income inequality widens and poor people do not share adequately in growth - a phenomenon observed in many countries in recent years'. Further, the Human Development Report says that 'economic growth is not an automatic remedy for non-income poverty (though it makes a powerful contribution – as long as public policies ensure that its dividends reach poor people).

Hulme and Shepherd (2003) argue that 'the quality or type of economic growth, rather than the overall rate of growth will be a key determinant of whether or not … poor people benefit.' They go on to put up a case for pro-poor growth where 'increasing the demand for labor across the economy, raising levels of public revenue and raising the income levels of the chronically poor could be beneficial'.

2.5.2.2 Pro-Poor Growth and Poverty Reduction

We will first consider the concept of Pro-poor growth. Many definitions have been put forward for pro-poor growth and there seems to be no firm consensus. Some organizations have defined pro-poor growth as growth that benefits the poor, or that leads to significant reductions in poverty (OECD, 2000; UN, 2000). The question however is what level of poverty reduction can be considered 'significant'. To go round this issue, two categories have emerged: relative and absolute (Resnick and Birner, 2006). The relative category emphasizes that pro-poor growth occurs when growth disproportionately benefits the poor and emphasizes that achieving pro-poor growth requires ameliorating inequality. A more strict definition holds that the absolute gains of

the poor must exceed those received by the non-poor. In the other category (absolute) the definition is more general and less strict: growth is pro-poor if it reduces poverty (Cord et al, 2003).

Cord et al (2003) advocate for the absolute pro-poor growth: growth that benefits the poor. They qualifies this however by arguing for policies that 'seek to increase the rate of growth of incomes of the poor, either directly by increasing the demand for assets with which the poor are endowed or indirectly by channeling an increasing share of the benefits of economy wide growth toward the poor'.

There is increasing empirical evidence that growth that is accompanied by deliberate policies of reduction of inequality will go a long way to helping in reducing poverty. This has been worked out in practice by emphasizing creation of income (mostly through labour intensive growth) as a means to poverty reduction. In addition, it should include social services, and safety nets, as well as a focus on women, rural development and pro-poor tax structures (Gerster and Zimmermann, 2003).

2.5.2.3 Sustainable Livelihoods Approach to Poverty Reduction

The Sustainable Livelihoods Approach (SLA) to poverty reduction is a people-centered approach to poverty reduction. According to the approach, a livelihood 'comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base' (DFID, 1999). DFID goes on to say that 'adopting the sustainable livelihoods approach provides a way to improve the identification, appraisal, implementation and evaluation of development programs so that they better address the priorities of poor people, both directly and at a policy level'. The approach puts a strong emphasis on the centrality of the people in the process of development. This means the approach starts with an analysis of the people's livelihoods, and how these have been changing over time; fully involves people and respects their views; focuses on the impact of different policy and institutional arrangements upon people/households and upon the dimensions of poverty they define (rather than on resources or overall output *per se*); stresses the importance of influencing these policies

and institutional arrangements so they promote the agenda of the poor (a key step is political participation by poor people themselves); works to support people to achieve their own livelihood goals.

The SLA has a framework (see Figure 2.1) that captures the main issues that come into play in the process of enabling sustainable livelihoods. The framework sets out how the livelihoods assets (human capital, social capital, physical capital, natural capital, financial capital) that the poor possess can be affected (destroyed or created) by the Vulnerability Context (Shocks, Trend and Seasonality). It also seeks to identify how the existing transforming processes and structures (e.g. levels of government, private sector, say) can influence access to these assets (for instance help in the creation of assets, determine access to common resources and influence the rates of asset accumulation) and how they (structures and processes) can be utilized to temper the vulnerability context (say through policies) and also recognizes that they influence and affect the livelihood strategies that the poor adopt in order to achieve livelihood outcomes (say of more income, increased well-being, reduced vulnerability, improved food security and more sustainable use of the natural resource base). The framework is the tool that is used in SLA in an attempt to understand and interpret the complex relationships that exist in the lives of individuals and communities as they seek to have more desirable livelihood outcomes. It thus provides the conceptual space for contextual livelihood analysis so that policies and interventions can be recommended. It places a high premium on the people and recognizes that people need access to assets for them to escape poverty. Each local context is unique and the framework is used to learn the environment in concert with the poor in a participatory manner.

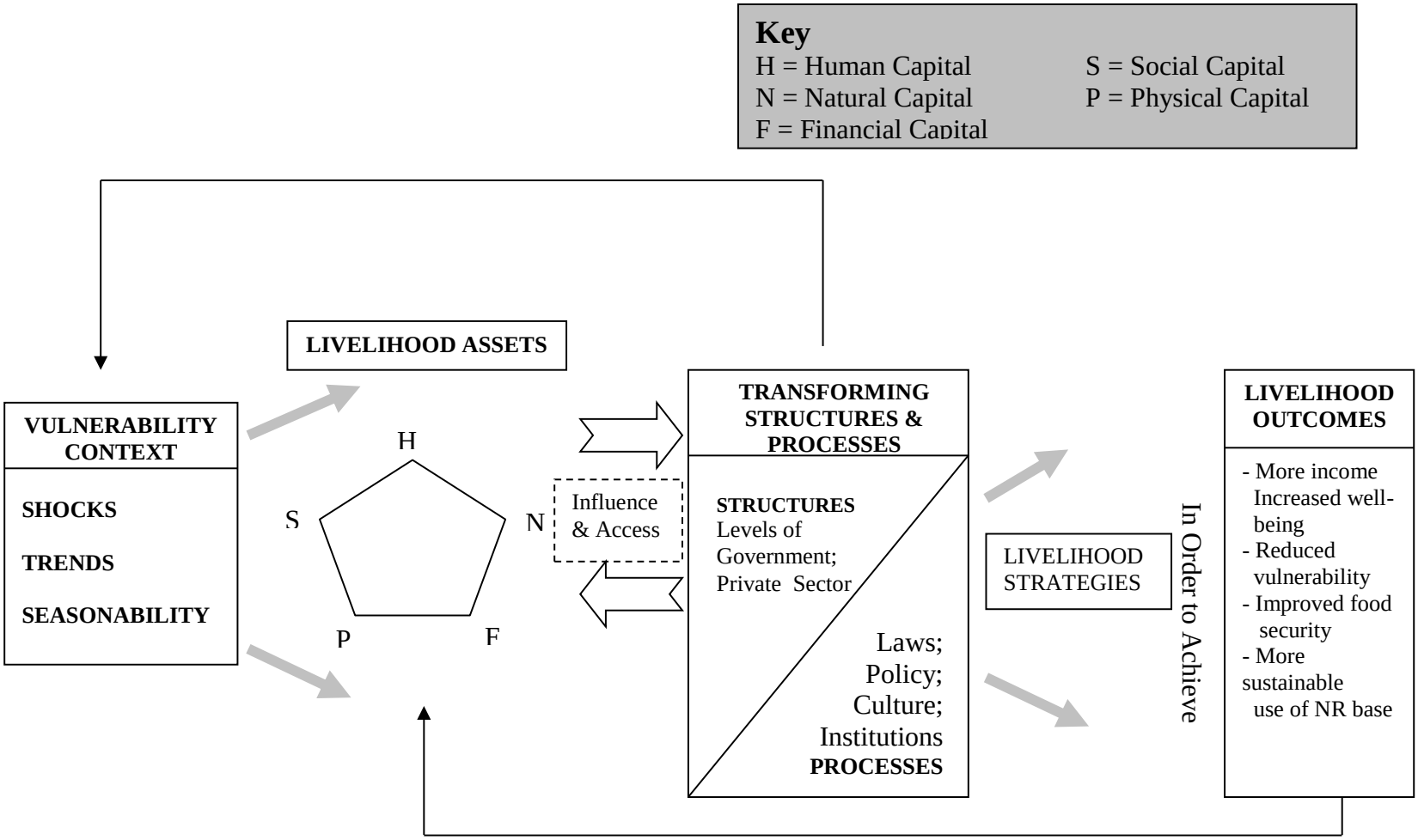


Figure 2.1: Sustainable Livelihoods Framework. Adopted from DFID (1999)

SLA advocates for a people-centred approach to getting strategies to reduce poverty. It advises participation of the communities as one of the ways that the people centred orientation can be achieved.

2.5.3 Weaknesses of the Poverty Reduction Approaches

In section 2.5.1, we observed that people will do all they can to pursue what they value, including mortgaging or losing their assets, making them fall into poverty. Poverty reduction efforts should therefore be geared towards availing or increasing the means for achieving what people value. Section 2.5.2 dealt with the review of different poverty reduction approaches. Our observation was that they have not had much success in reducing poverty and in some instances the state of the poor has deteriorated. As for the approaches of some of the International development organizations we reviewed, they seemed to agree for the need to empower the poor through policies and strategies for availing opportunities and dealing with environments that constrain the poor from achieving what they value.

From the above, it is apparent that many of the approaches for reducing poverty have not dealt with the foundational issue of value and the need to avail to the poor the means for achieving what they value. It is thus clear that the existing approaches lack the practical elements of addressing the issue of value and the means to achieve what people value at the micro level.

2.5.4 Capability Approach and Poverty Reduction

As we proposed to use CA for poverty reduction, it became apparent that CA has challenges that call for further work for it to be operationalized for poverty reduction. These challenges include the deliberate incompleteness and pluralism of CA (Alkire, 2002:10). This calls for a lot more information for its specification at the local level.

2.5.4.1 The Challenges of the Incompleteness and Pluralism of the Capability Approach

When we consider the Capability Approach for the purposes of evaluating development or poverty reduction, we find that the definition of capability is too wide. The term ‘valuable beings and doings’, without further specification seems to cover a wide

spectrum. To come up with individual capability set, let alone compare capabilities, seems to require extra information. Further, 'the definition of capabilities does not delimit a certain subset of capabilities as of peculiar importance; rather the selection of capabilities on which to focus is a value judgment, as is the weighting of capabilities relative to each other (Sen, 1992a). Individual advantage can be assessed in at least four different spaces: wellbeing-achievement (say nutritional status), well-being freedom, agency achievement, or agency freedom (Alkire, 2002:9). This means that when Sen argues that social arrangements be evaluated with respect to 'freedom', 'he is advocating equality in a 'space' that has quite a substantial degree of internal plurality and requires further specification.' (ibid).

The capability approach supports pluralism – the view that valid well-being and valid social welfare come in diverse forms. This it does by enlarging the information basis of social choice and social welfare analyses to include a greater range and kind of welfare (than simply happiness or revealed preference) and by coordinating the moral principles that coordinate this information to include considerations besides welfare.

The question of value - which the capability approach puts much emphasis on - is important and needs to be developed further. One of the reasons for this, according to Alkire, is that development aid aimed at economic development has been successful but with disturbing regularity has also contributed to increases in inequality, conflict, unemployment, corruption, dependence, unmanageable urbanization, environmental degradation and loss of cultural identity. This has led some to reject development outright while others have called for additional values that appertain to development to also be included.

Some have questioned whether CA is operational due to the rich array of possible functionings, the fact the there is no agreement on the notion of the good life and how to value sets (Sugden, 1993 pp. 1953). On value, Stewart (1996) claims that CA seems to rationalize rather than resolve value conflicts, and advocates for prioritizing basic capabilities, which according to her should be specified. Other criticisms of the approach include the fact that more theorizing of how basic capabilities can be defined, procedure

for the evaluation of functionings, and the need to address the means of freedom and negative freedom (Stewart, 1996; Nussbaum, 1988; Qizilbash, 1996).

To address issues of incompleteness, pluralism and the extra information needed, CA needed further specificity to operationalize it for poverty reduction at the micro level, and subsection 2.5.4.2 briefly reviews the way that Alkire (2002) does this.

2.5.4.2 Towards Specifying Dimensions of human Development

To operationalize the capability approach for poverty reduction purposes, Alkire (2002) tackles the issues of plurality and incompleteness by proposing, not a list of basic capabilities but a list of human development dimensions; dimensions that can be utilized for poverty reduction. She proposed a practical reason approach to explore the reasons that people base their decisions on (Alkire, 2002:44). She adopts Finnis List of the basic reasons of human action based on the principles of practical reason (Grisez et al, 1987). This is list is a discreet heterogeneous set of most basic and simple reasons for acting which reflect the complete range of kinds of valuable human states and actions (the complete range of functionings) (Alkire, 2002:46).

Alkire explains that in recognizing the most basic reasons for acting of individuals and communities, one is recognizing reasons which are 'worth wanting', that is good, but not yet in a virtuous way. Finnis goes on to point out that these dimensions are pre-moral and hence one can analytically identify the intelligible 'ends' of both 'moral' and 'immoral' actions with reference to the same dimensions, and also that the dimensions are common both for individuals and for society.

Informed by Finnis' list of basic reasons for acting, Alkire then goes on to propose some dimensions of human development. Alkire's argument is that Finnis' basic reasons for action, can be looked at as dimensions of human flourishing in that they express the complete irreducible dimensions of value 'with reference to which the value of 'valuable' human functionings can be expressed. Recalling that functionings are "beings and doings" that people have reason to value, and seeing that the list above gives us the 'reasons' for actions, and hence the 'values' on which people premise their actions, we can then look at the list as a list of values. The reason why a person will pursue to do a certain thing can be found among these basic reasons for actions. Also, the reason(s) why people will seek to be in a certain state or become 'something' can be found on Finnis'

list. This list therefore represents why people value what they value and hence, according to Alkire's argument they are dimensions of value. This also implies that they are dimensions of human flourishing because this is what people value and hence all their aspirations and actions can be tied to or be deduced from or be influenced by one or more of the dimensions. A person who achieves her aspiration (which in the first place is based on one or more of the dimensions) can be said to be flourishing.

Alkire further proposes that 'if (and only if) poverty is seen to be multi-dimensional, then Finnis' basic reasons for action might also be dimensions of poverty reduction, broadly conceived' (Alkire 2002:52). This, she argues, is because 'taken together, the dimensions of human flourishing comprise a complete set of the most basic reasons for which people act in seeking 'wholeness' or 'well-being', in pursuing normative 'human development.' If poverty reduction is increasingly recognized as possibly encompassing any aspects of well-being, it may be more helpful to construe Finnis' basic reasons for action as the *dimensions of poverty reduction'* (ibid). She goes on to suggest that 'Finnis' basic reasons for action (as conceived in principle, even if the actual list evolves) represent the dimensions of functioning and capability and that they are a general model of the possible dimensions of humanly valued beings and doings …'. She then argues that 'poverty reduction is a function of these dimensions … that is all valuable capabilities can be represented in terms of these dimensions of poverty reduction'.

A further clarification is that an individual or group flourishing does not require a positive level of participation in each dimension. Finally on this account of these dimensions, Alkire posits that 'the purpose of identifying … dimensions … is to offer a framework within which different values that communities have, may be understood.'

2.5.4.3 Basic Needs and Basic Capabilities

By its very nature, the capability approach lacks specificity of central capabilities that can be looked at as basic to evaluate absolute poverty – capabilities without which one would be considered absolutely poor. This is important since absolute poverty can be looked at as basic capability failure and we would need to ensure that this failure is tackled for poverty reduction to be realized. This implies that there is need to consider how this specification can be done to make the approach operational for poverty reduction. The

section therefore looks at the additional information that would be required before we can come up with basic capabilities.

The Capability Approach places a premium on agency and hence local decision making is important in deciding the capabilities that are valuable to a community. Sen argues that much as poverty will always have an element of context-dependence, 'there is an irreducible core of absolute deprivation in our idea of poverty, which translates to reports of starvation, malnutrition, and visible hardship into a diagnosis of poverty without having to ascertain first the relative picture' (Sen, 1982:432-49

The logical next step is to identify these basic capabilities or to describe how the basic capabilities can be identified (i.e. the criteria for their selection). In seeking to establish criteria for specifying basic capabilities, Alkire looks to David Wiggins' explication of the procedure for identifying basic human needs. In order to make this specification, Wiggins first defines absolute and then entrenched needs. Absolute (or categorical needs) refer to needs which, if unmet during a specified time period, blight one's life or cause serious harm (Alkire, 2002:159). Absolute needs satisfiers are a prerequisite for living an unharmed life. Basic needs are a subset of absolute and entrenched needs.

Alkire then goes on to propose that basic capabilities could be specified according to Wiggins' account. She interprets this by first describing basic needs relative to the substantive functionings that is harmed if the basic need is unmet rather than relative to the object that is instrumental to satisfying the need. Secondly, basic capabilities or basic needs capabilities will comprise a band of functionings which are expressed at a sufficient level of generality to indicate basic needs. The conclusion is that a basic capability is a capability to enjoy a functioning that is defined at a general level and refers to a basic need, in other words a *capability to meet a basic need* (a capability to avoid malnourishment; a capability to be educated, and so on). The set of basic capabilities might be thought of as capabilities to meet basic human needs. When it is necessary to refer to the set as a whole, it might be called the 'capability to meet basic human needs' (Alkire, 2002:163).

The next question to consider in our quest to operationalize the capability approach for poverty reduction is what we need concentrate on: basic capabilities or basic

functionings? The capability approach requires that changes in basic needs be valued with respect to the freedom of the same people whose needs are being affected (ibid:172). She further posits that 'information on participation would also convert functioning information into capability information, because by definition participation procedures allow members to consider alternatives and to affect development processes iteratively'. The position being put forward is that we should go for basic capabilities and not basic functionings but that basic functionings (functionings related to a basic human need) with information on participation can point to basic capabilities. For there to be poverty reduction therefore, the emphasis must be on capabilities and not functionings since the involvement of the community (participation) in the choice of the valuable dimensions is key. It has also been pointed out that in certain cases, functionings can be used to point to the capabilities. If all the members of a community choose a certain functioning (that would be harmed if the basic need was not there, say health), it becomes a basic capability since we have participation information.

2.5.4.4 Operational Interpretations of Basic Capability

Alkire (2002:174) next looks at a way of conceptualizing the relationship between basic functionings and capabilities in small poverty reduction activities. This is done as a step to getting operational interpretations of basic capability. The goal should be to expand valuable capabilities, which can be operationally interpreted in three different ways:

- increase the general basic functionings that are prerequisites to being able to exercise valuable capabilities;
- to increase basic functionings on the assumption that nearly 100 percent will (or another empirically verifiable percentage) of persons would choose them;
- to increase the basic capabilities people have, which requires one
  (a) to identify valued capability goals and strategies (e.g. using participation);
  (b) to work in the short term to establish functionings instrumental to these goals;
  (c) to use a procedure in the implementation that safeguards negative freedom
  (d) to mitigate the contraction of wider capabilities that occur as a result of expanding basic capabilities (where possible, to allow both to expand)

The first assumes that at the micro level, 'the capability to meet basic needs' is equivalent to 'meeting basic needs' or having the associated functionings. One could try and justify this by arguing that some general basic human needs functionings (e.g. life expectancy, literacy) are prerequisite to other capabilities. The difficulty with the goal is that if for instance the functionings were achieved in a community but with coercion by the government, then one can argue that there were no expansions in capabilities. If on the other hand the functionings were not met at all, there would still be no expansion of capabilities. Clearly the two situations are not the same. If on the other hand one was to have participation as a separate functionings then the differences in the two situations would be reflected by different indications of participation.

In the second alternative, one retains the goal of capability but poses a counterfactual hypothesis that in the various sectors chosen, if people were asked, the 'uptake' of the functionings provided would nearly by 100 per cent. An argument can still be put forward for explicitly going for participation because participation would 'specify general needs appropriately and facilitate sustainable and efficient activities, and also may have further intrinsic benefits in terms of ongoing self-direction' (Alkire 2002: 174).

The third is that capability at the micro level simply refers to an absence of coercion and the ongoing possibility of choice. Negative freedom 'is concerned with the area in which a person can act unobstructed by other people. It is to be understood in the sense of other people intentionally interfering with that person and thus impinging on her freedom or coercing her' (Barnbeck, 2006:10). Negative freedom thus ensures that the person (or community) can act unobstructed such that the person has the freedom to reject what is on offer even where what is being offered is valuable in the eyes of the benefactor.

The capability approach in this alternative has been broken down into three components that can be implemented separately. It argues for participatory approach, and for a protection of negative freedom. The third alternative seems most coherent with the interpretation of the capability approach (ibid). Alkire (2002, pp 176) finally points out that 'if one was to accept this interpretation of the capability approach then provided one was within the framework of (a) and (c) one could aim at improving functionings (b) and still conceive this as a 'capability' approach. She further argues that as regards 'basic

capabilities', which is capabilities that pertain to absolute poverty, the interpretation is defensible as it seems consonant with Drèze and Sen's empirical work (ibid).

The other aspect in the quest to interpret the operational aspects of the basic capability is the possibility of the mingling of basic and non-basic capabilities. Alkire considers empirical evidence corrected from different poor communities that were asked to identify categories of changes (beneficial or harmful) that certain development projects had brought about in the community. The interesting finding is that the people valued non-material impacts (for example unity, helping others, religion) as well as impacts that affected their material well being (for instance health, savings, education). Even more interesting was that on being asked to rank the beneficial impacts in terms of importance, the material well being did not out rank the non-material, nor vice versa – they were interspersed. This has been confirmed by many other studies in different communities around the world who value different dimensions differently (Krishna, 2005; Narayan et al, 2000a,b). This emphasizes the point that 'the objectives for improving one's own material well-being – which are often held by international donors and NGOs – are not necessarily the most important objectives of local communities and are certainly not the only important objectives' (ibid:180). This, she points out introduces a significant operational concern to be factored into poverty alleviation projects. It also reiterates the crucial importance of participation in poverty reduction projects.

Taking the above two concerns into consideration, Alkire finally proposes the operational interpretation of the capability approach as it relates to capabilities to meet basic needs, whose long term goal is to increase the basic capabilities people have without contracting their overall capability set. This operational framework is briefly outlined below.

2.5.4.4.1 Identify long-term valued capability goals and strategies (i.e. using participation)

The approach emphasizes 'capability' which we have seen is the *freedom to pursue or promote functionings which one has reason to value*. The poor are deprived of valued basic capabilities. There is need to establish the basic human needs functioning that the poor value whether at the individual, household or community level. Different people have different values and there is need to establish what the poor in particular

communities value as this cannot be assumed. For a household or community, there must be a mechanism to establish what is valued. This is because there are many members in the community who may not necessarily value the same functioning and there would need to be consensus on what functioning is valued.

Further, members of a community may not have reason to value a particular functioning that is valuable in the eyes of an outsider (e.g. an NGO or government). Even for a functioning that is valued by members of the community, we have observed the intrinsic value of a person [or community] acting freely and being able (being the one) to select it. This implies that members of the community should have the opportunity to do the selection of the functioning since the process [of selection] avails the community the possibility [during the participation] of bringing about friendship, sociability or consolidating a sense of community, purpose and cooperation among the decision-making group. The selection of the valued functionings and the strategies for achieving them must therefore be done through participation.

2.5.4.4.2 To work in the short-term to establish functionings instrumental to these goals;

This will involve working out ways and means to expand (or achieve) the identified [and prioritized] functioning(s). After the required functioning(s) to realize the basic human need(s) is (are) identified in the first step though participation, the next step will be to look for ways through which the functioning(s) can be made realizable by the community. Depending on the identified functioning, this could involve a program or project for the purpose of ensuring that the related capability is expanded. This is the practical intervention that will need to be implemented for poverty reduction purpose. It is important to incorporate the selection of capabilities and strategies though participation.

We have pointed out that development should be looked at as expanding the freedom that people have to promote (or achieve) what they value. For an individual or household to flourish, there will need to be choices from which one can choose from, the ability to do the choosing, and the option of rejecting what is not valuable to them irrespective of who approves Poverty reduction will therefore require the expansion of functionings for

individuals and communities and also the ability to choose (including the negative freedom to decline choosing any opportunity they do not have reason to value irrespective of who is availing/offering the opportunity). Poverty reduction therefore should involve the expansion of the means to achieve what is considered valuable and the ability to utilize the means in order to realize the functionings.

Robeyns (2005) gives a framework depicting a person's capability set and her social and personal context. The framework was adapted by Zheng (2007) to represent the relationship between the means to achieve, the freedom to achieve and the achievement (Figure 2.2).

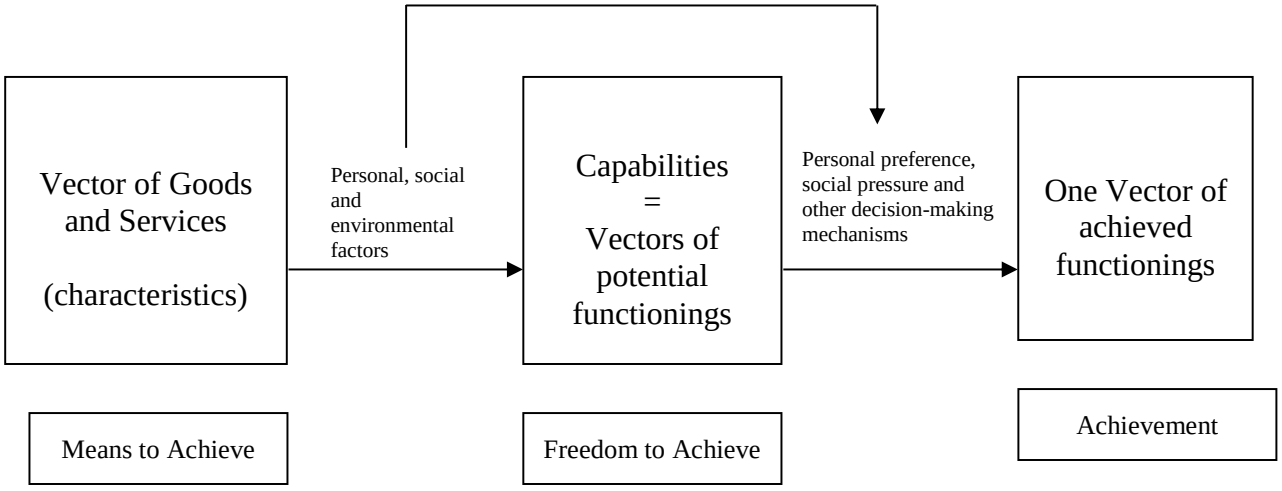


Figure 2.2: A stylized non-dynamic representation of the core aspects of the capability approach. Adopted from Zheng (2007)

Goods and services are important only in the light that their characteristics enable people to do and to be (i.e. in the light of the capabilities that one can generate from these goods and services) (Robeyns, 2005). From figure 2.2, we see that the extent to which a person can generate capabilities from goods and services are influenced by three conversion factors – personal, social and environmental characteristics (Robeyns, 2005; Sen, 1992). Personal characteristics that influence the degrees of capabilities that one can generate from resources include mental and physical conditions, literacy and gender. Social factors are characteristics of social settings such as social norms (e.g. role for women, rules of behavior, materialism, religion, etc), social institutions (e.g. rule of law, political rights, public policies), and power structures (e.g. hierarchy, politics). Environmental characteristics that are important in the conversion of goods to individual functionings include climate, geography and infrastructure.

Goods and services are the means to achieve (a life that one values), while the person's freedom to achieve is defined by the capabilities – the potential functionings – that one is endowed with, including what their individual conversion factors allow them to generate from the available goods and services (Zheng, 2007). Zheng adds that the conversion factors are constantly changing and that the exploitation of commodities such as technology contributes to social conditions and personal characteristics which would feed

back to the conversion factors and decision-making mechanisms, meaning that commodities can have an impact on both individual capabilities and conversion factors.

Establishing functionings instrumental to the identified capability goals will therefore require the provision of the means to achieve the functionings. The freedom to achieve the functionings (at the individual and household level) will depend on the conversion factors identified above. To follow our framework therefore, after members of the community have identified the valued potential functioning(s) (through participation), it will be necessary to avail the means to achieve them (functionings). For this to happen (provision of means), there will be need first to identify the strategies necessary to realize the identified functionings. The community must be involved in the identification of the strategies.

The realization of the strategies identified will results in the means, for instance technologies, solutions, infrastructure, programs, projects, policies, etc. During the process of providing the means to achieve, the issue of conversion factors will need to be considered since the freedom to achieve will depend on the conversion factors of the individuals or households. This is because the conversion factors will influence the ability to choose and the ability to reject the choices available. In situations where the socio-environmental conversion factors can constrain the degrees of capabilities that she can generate from characteristics of the available means (resources, goods and services), it may be important to look at ways of influencing the factors in order to lessen the constraints so identified. Providing the means to achieve and ensuring that any constraints in the conversion factors are dealt with will give the person freedom to achieve the valued functioning. Another way of looking at it is to first identify the conversion factors and then factoring them in the choice of the means (of achieving) chosen. Conversion factors can also influence the realization of capabilities by incorporating the factors in the design of the means. That way it will be easier for the people to utilize the means.

2.5.4.4.3 To implement a strategy such that negative freedoms are safeguarded

By emphasizing on the importance of agency freedom, the capability approach values negative freedom. The beneficiary must not be forced (or coerced) into accepting what they do not have reason to value. It may well be that they value something else as opposed to what is on offer. In such a scenario, the choice of the beneficiary must be respected with no attempt whatsoever to force them. Where the agency or government reckons that the functioning is especially important for the community, they must seek for ways of value change through public discussion and not force the community.

It must be ensured that the poor communities have negative freedom guarantees during the process of identifying the capability goals and strategies and also in the process of conceptualizing, designing developing, implementing, monitoring and evaluating the project. This will ensure that the identified functionings are indeed valuable and that the poor have the capacity to resist any coercion and possible elite capture of projects that concern their welfare.

2.5.4.4.4 To mitigate the contraction of wider capabilities that occur as a result of expanding basic capabilities (where possible, to allow both to expand)

The next task will be monitoring and evaluation of the project to find out the impacts of the project on the community; whether the intended impacts have been achieved and also whether there were unintended impacts. The monitoring of the project will involve issues of efficiency of implementation and utilization of the project resources for the purpose of the project. The evaluation will not only be about the resources but also on the purpose for which the project was selected and designed in the first place which is the expansion of the capabilities chosen earlier. Further, there is need to check on the possibility that the project will contract the wider set of capabilities. This is necessary because much as reduction of poverty involves expansion of basic capabilities, flourishing involves the full range of capabilities and hence a provision must be made to ensure that the community flourishes. This will happen when the other capabilities are not contracted. The best

scenario of poverty reduction is one that ensures that the community flourishes (by expanding other capabilities) up and above the expansion of basic capabilities, or at least ensures that the other capabilities are not affected negatively.

2.6 ICTs For Poverty Reduction: A Review of the Evidence

That many have believed that ICTs can be pathways out of poverty goes without saying as we look at the resources that have been invested in many ICT for poverty reduction initiatives and projects. While this optimism exists in many quarters, many skeptics exit. The 'Poverty & ICTs in Urban and Rural East Africa (PICTURE) research program supported by Canada's International Development Research Centre (IDRC) worked to get empirical evidence on the relationship between ICTs and poverty in the East African countries of Tanzania, Uganda, Rwanda and Kenya. After surveying 1600 households on ways that multi-dimensional poverty was being affected by ICTs in the four countries between 2008 and 2010, the research identified clear indications that ICTs have an effect on poverty. The research results are captured in a book the researchers compiled called "ICT Pathways to Poverty Reduction. Empirical evidence from East and Southern Africa." (Adera et. al, 2014). A few highlights from the book are briefly outlined below.

Miroro and Adera (2014) note that mobile phones and radios were found to have contributed to improvement in people's social and economic livelihoods. Waema and Miroro (2014) enumerated various ways that ICTs were found to contribute to poverty reduction. These included acquisition of educational information, agricultural knowledge, skills for improving one's life, income generation activities and increased income. Other ways included participating in governance, thus enabling people's voice to be heard and reduction in vulnerability and improvement in safety. Mascarenhas (2014a) reports that increased access to ICTs [in Njombe - Tanzania] had contributed to higher rates of poverty reduction. Attwood, Diga and May (2014) after evaluating the causality between ICTs and quality of life in South Africa reported that the 'evidence suggests that this ICT intervention did contribute to an improvement in quality of life.'

In giving conclusions to the research Mascarenhas (2014b) states that 'there is a direct association/link between access to ICTs and poverty reduction; ICTs have a direct impact on poverty reduction; access to and use of ICTs can have many benefits that have a positive impact on improving livelihoods and thus reducing poverty.' The reported research was quantitative, supplemented with qualitative evidence, showing that greater access to ICTs led to reduction in poverty.

2.7 Towards an ICT-for-Poverty-Reduction Framework Using CA

2.7.1 Review of Background Theory and Frameworks

In section 2.5.4, we reviewed the capability approach and poverty reduction. We already observed that poverty is basic capability deprivation or failure. We saw that to combat poverty at the micro level, there is need to expand the capability to meet basic human needs. In section 2.5.4.5, the operational interpretation of the capability approach as it relates to the capability to meet basic needs are discussed. This specifies how basic capabilities can be chosen at the micro level. We observed that poverty reduction (increasing the basic capabilities that people have without contracting the overall capability set) will require:

1. Identifying long-term valued capability goals and strategies (i.e. using participation);
2. Working in the short-term to establish functionings instrumental to these goals;
3. Implementing a strategy such that negative freedoms are safeguarded;
4. Mitigating the contraction of wider capabilities that occur as a result of expanding basic capabilities (where possible, to allow both to expand).

Our research seeks to study aspects of establishing functionings instrumental to the capability goals and strategies identified. Once the strategies for realizing the functionings are in place, the next stage involves conceiving ways that ICTs could be utilized as candidate technologies to enable the realization of the strategies, leading to the design and development of the required solutions.

The conception, design and development of the ICT solution needs to be carried out with close community involvement, with the design being participatory Bailur (2007). Brand and Schwittay (2006) advocate the Human-Driven Design and Research (HDDR) for ICT and Development solutions in order for them to serve the purpose, be appropriate and sustainable. According to them, HDDR projects are those 'whose design and innovations are driven by in-depth knowledge about local conditions … gained from long-term, human-centred research similar to anthropological participant-observation, and a participatory community design process' (Brand and Schwittay 2006:3).

After the design of the means (ICT solution) for the expansion of the identified functionings, they will need to be implemented in the community. This will involve close involvement of the community. Upon implementation of the solutions, there will be need to evaluate the suitability of the implementation, especially as concerns the enabling of the chosen functionings as played out in every-day activities and livelihoods of the community. The evaluation will also seek to identify any negative consequences of the solution for any and particular persons/households. The evaluation can either show the suitability of the solutions or the need for redesign and development of the solution which would feedback to the design and development stage.

Once the Solution has been implemented in the community, the members of the community will then begin to use it to realize the valued functioning, which may well be a livelihood activity. The solution, be it a technology or a service is only useful to the poor community member or household in so far as they can convert it to the desired capability.

We next explore the process of converting the ICTs to the valued capability. In section 2.5.4.5, we looked at a framework (Fig. 2.2) that brings out the relationship between the means to achieve, the freedom to achieve and the achievement. We observed that a person's freedom to achieve is defined by the capabilities that one is endowed with, including what their conversion factors allow them to generate from the available goods and services. Further, the extent to which a person [or household] can generate capabilities from goods and services is influenced by three conversion factors – personal, social and environmental characteristics (Robeyns, 2005; Sen, 1992). In our case,

capabilities one can generate will be determined partly by what a person or household is able to convert from the availed technologies or ICT solutions.

We next consider how the conversion factors enable or constrain the conversion of the means (availed ICT solution, plus other resources) to capabilities. There is paucity of research presently on the conversion of means to capabilities. Conversion factors have been identified, but there is insufficient research to explore the conversion process, the influence of conversion factors on the conversion process and the considerations of the people during the conversion process.

In an attempt to explore the conversion of the means to capabilities, we also explored the Sustainable Livelihoods Approach (SLA) mentioned in section 2.5.3.3. SLA has a framework, the Sustainable Livelihoods Framework (SLF), which attempts to explore the process the poor go through in their quest to come up with strategies for achieving livelihood outcomes. Upon close observation of the SLA, it becomes apparent that it has some conceptual parallels with the CA. This is because the requirement for community participation ensures the choices made will incorporate the value of the community, which CA also recommends. Further, the "capitals" of SLA mirror the means (resources) which CA anticipates. For CA, conversion factors facilitate or constrain the conversion of the means to valued capabilities.

As for SLA, there are structures and processes that influence people and affect the access to the capitals and these can affect whether the people will be able to utilize the capitals to come up with the strategies needed for sustainable livelihoods. These structures include levels of government and private sector, while the processes anticipated include laws, culture, policies, institutions. It would seem like the influence of these structures and processes could have some paallels to the way conversion factors of CA affect conversion. In a certain sense therefore, the SLA framework seems to captures some aspects of the conversion process. From this, it is apparent that the SLA framework can provide a way to explore the conversion process. One limitation of the SLA though is the fact the capitals are limited and the development outcomes are pre-determined and not left to the individual to determine and this is a departure from Sen's Capability Approach (Klein, 2009). Whereas SLA talks brings out the place of people utilizing their resource

portfolio (livelihood assets) in the context of the vulnerability context to come up with livelihood strategies, and the importance of the transforming structures and processes in resource access and accumulation, it does not explicitly bring out agency freedom which is part and parcel of the capability approach.

In an attempt to understand how CA can be operationalized for development using ICTs, Kleine (2008) proposed the Choice framework (Figure 2.3). The framework borrows from the Sustainable Livelihoods Approach Framework of the UK DFID and Alsop and Heinsohn's (2005) framework on the relationship between outcomes and correlates of empowerment. The choice framework has the Structure, which captures policies and programs, formal and informal laws (including norms on usage of space, norms on usage of time), institutions and organizations, discourses, and access to ICTs [availability, affordability of ICTs and necessary skills for ICTs]. The framework uses 'resources' instead of the 'capitals' of the SLF: these resources are taken to be individual agency-based capability inputs. By utilizing these structure-based capability inputs ('structure' in the SLF framework), the resources can be converted to capabilities.

The framework further identifies age, gender, ethnicity as personal characteristics of an individual, which influence the scope and scale of the resource portfolio. The resource portfolio is borrowed from the 'capitals' of SLF that include Human, Natural, Financial Social and Physical resources. In additional to this resource portfolio of the SLA, Kleine's Choice framework adds Material resources, Geographical resources, Psychological resources, Information resources and Cultural resources. In the framework, the utilization of these resources in the context of the Structure gives an individual the dimensions of choice to realize the outcomes. The dimensions of Choice include existence of choice, sense of choice, use of choice, and achievement of choice. The primary outcome is identified as Choice, while the secondary outcomes may include easier communication, increased knowledge, access of markets, more voice, increased income, etc.

Kleine (2009 pp 111) views resources as ' individual agency-based capability inputs which, together with structure-based capability inputs, can be converted into capabilities.' The Choice framework therefore opts to look at both resources and structure as capability

inputs. These agency-based capability inputs (resources) 'represent an attempt to holistically map aspects of the agency element of the systemic framework.' The framework further says that the 'resource-based agency can only be realized within the confines of and in systemic interaction with a given structure' (ibid pp 112). On the interaction between the resources, the structure and the agency, Kleine says that the structural factors have a complex relationship with an individual's resource portfolio and that the interface between the opportunity structure and individual agency include reciprocal and cumulative processes.

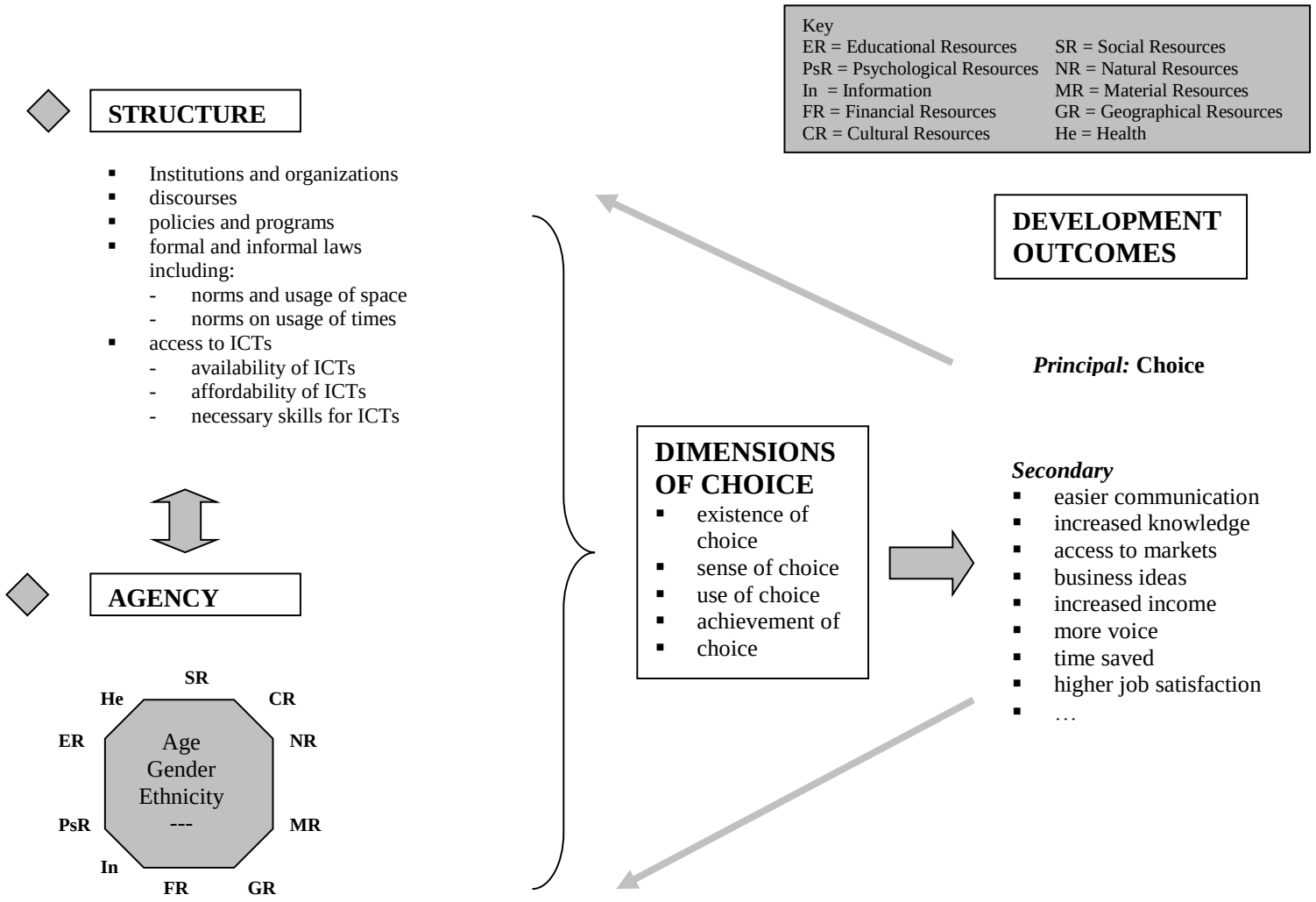


Figure 2.3: The choice framework. Adopted from Klein (2009)

The choice framework also has Dimensions of Choice. This was borrowed (and enhanced) from the degrees of empowerment in the Alsop and Heinsohn's (2005) empowerment framework. In the choice framework, the dimensions of choice include existence of choice, sense of choice, use of choice, and achievement of choice. When we observe these dimensions of choice, it is clear that some of them are indicative of dimensions of freedom, or the vectors of achievable functionings. This is because Kleine (2008 pp. 111) explains the existence of choice thus: 'whether the different possibilities exist and are, in principle, attainable for the individual if the combination of their resource portfolio and the structural conditions would allow it.' This, combined with the sense of choice is indicative of the freedom (real opportunity) that CA anticipates. The framework's 'use of choice' has to do with "choice" (Robeyns, 2005 pp.98) that is made in reality to utilize the means to achieve the functioning. The 'achievement of choice' is really the achievement or development/poverty reduction/wellbeing outcome.

In the Choice framework, there is a tight coupling of resources, agency and structure. The framework views resources as "individual agency-based capability inputs" while 'structure' is viewed as "structure-based capability inputs." These two inputs 'can be converted into capabilities.' The idea projected is one where a human agent makes a decision to utilize certain resources to realize a functioning that they have reason to value given the facilitating (enabling or constraining) context of the structure. The framework therefore elects to conceptualize the conversion as a black box in which decisions on the utilization of resources and the action of the structure go into and out comes the capabilities. In the Choice framework, Kleine (2000 pp 111) seeks to 'holistically map aspects of the agency element of the systemic framework,' and further adds that the 'resource-based agency can only be realized within the confines of and in systemic interaction with a given structure' (ibid pp 112). Klein finally says that during the interaction between the resources, the structure and the agency, the structural factors have a complex relationship with an individual's resource portfolio and that the interface between the opportunity structure and individual agency include reciprocal and cumulative processes.

Whereas the important aspects of moving from the resources to capabilities are captured, yet the box is left unopened. This research sought to empirically explore the conversion process and hence needed to pry open the black box. Sen (1992) states that the relationship between a good and the achievement of certain functioings is influenced by personal social and environmental conversion factors. From this we see that resources are the means of achieving functionings that people have reason to value. The capability approach demonstrates the importance of individual diversity by not only addressing the resources but the context where the person is living.(Robeyns, 2005). What emerges is the resources, the socio-environmental context and the functionings. The capability approach says that the ends of development should be to expand the freedoms that people have to achieve what they value and have reason to value. The capability has both opportunity and freedom while freedom has both the opportunity and process. Process freedoms have to do with agency (Sen, 2002). In conceptualizing and utilizing the approach there is need to pay close attention to each of these aspects of freedom. Whereas the choice framework has the different aspects, the risk is there for one to emphasize the opportunity aspects at the expense of process freedoms. The sustainable Livelihoods Framework (SLF) uses structure and process to incorporate the social context. The Choice framework seems to downplay the process aspects at the expense of structure, which according to SFL cannot function if the processes are non-functional. Kleine states that

> Both the empowerment framework suggested by
> Alsop and Heinsohn and the SLF take into account
> not only individual agency, but also structures which
> aid or constrain this agency (Kleine 2009 pp112)

Kleine then goes on to say that

> SLF includes these as laws and "culture" … but also policies,
> institutions and processes (Kleine 2009 pp112)

SLF (DFID, 1999) states that laws, policies, culture and institutions are aspects of process, while levels of government and private sector compose the structure. The choice framework bundles all of them to a construct called discourses

In Figure 2.2 (section 2.5.5.5), we have a non-dynamic representation of the core aspects of the capability approach by Robeyns (2005) and Zheng (2007). The framework shows

the relationship between the means to achieve (goods and services), the place of the conversion factors (personal, social and environmental) in getting the freedom to achieve, and the achieved functionings. Also captured is the place of the context (social conversion factors and environmental conversion factors) and their effect on personal conversion factors during the conversion of goods and services to valued functionings. Whereas Robeyns (2005) captures the relationship between the resources and the functionings and points out the place of the conversion factors, the framework does not clearly define and specify the characteristics of the factors. In the framework, the key role that the context plays does not come out very explicitly. To give an example, the social and environmental context will have an influence on the resources. They will affect access to, and use of the resources and hence the conversion. The framework does not explicitly show this since we do not see an arrow brining out the effect of the socio-environmental context on the resources. The place of agency freedom is not clearly illustrated in the framework.

2.7.2 The Conceptual Framework

Borrowing from the Sustainable Livelihoods Approach Framework (DfID, 1999), Kleine's (2008) Choice Framework, Robeyns' (2005) and Zheng's (2008) frameworks, we propose a conceptual framework on the conversion of ICTs to basic capabilities (Figure 2.4).

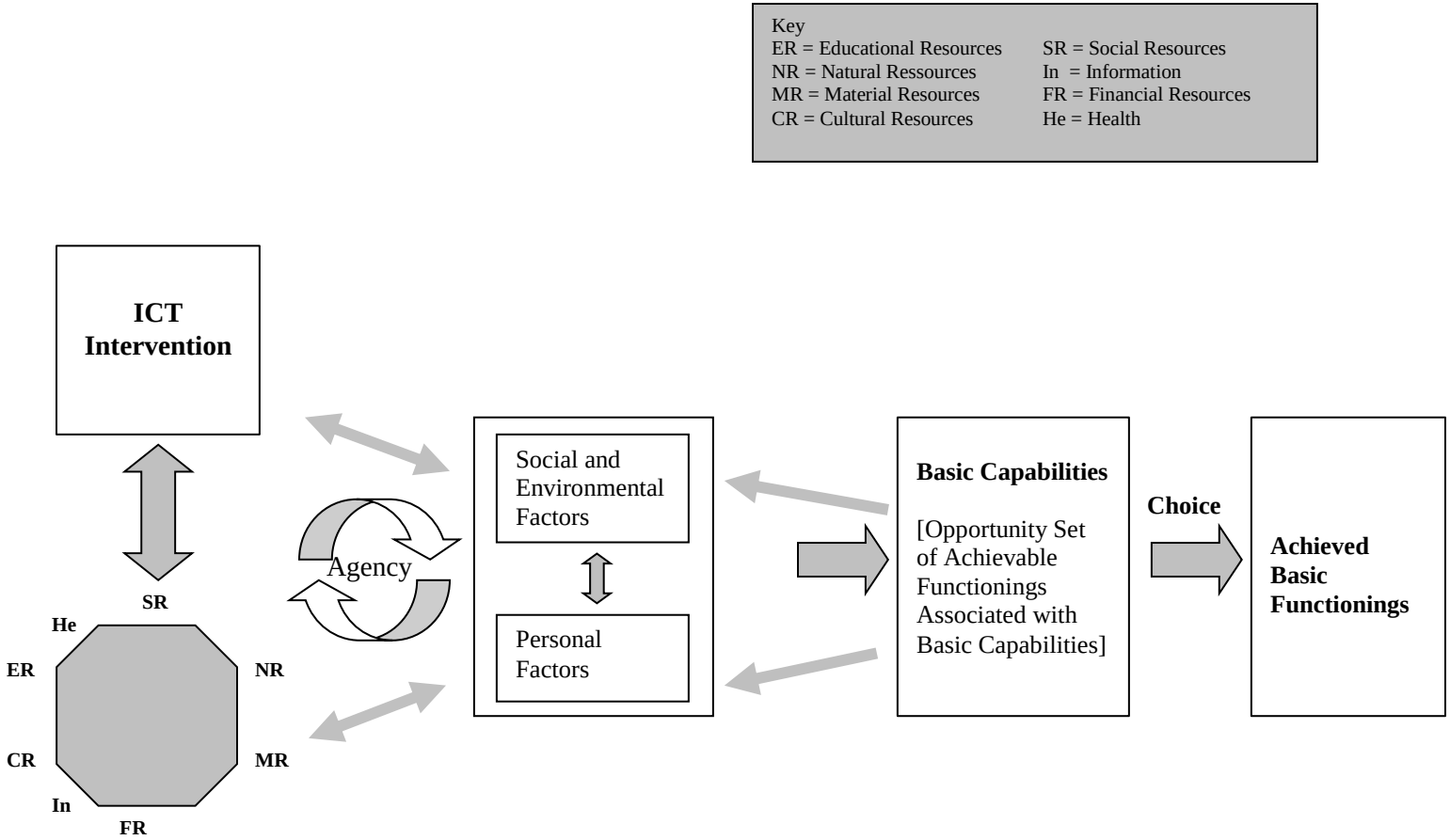


Figure 2.4: Conceptual framework

The framework attempts to explore the process of the conversion of means (ICTs) to capabilities. We start with Robeyns' (2005) and Zheng's (2008) framework (Figure 2.2), a stylized non-dynamic representation of the core aspects of the capability approach. It captures the relationship between the means of realizing the capabilities (vectors of goods and services), the freedom to achieve (the capabilities) and the achievement. It situates the place of the conversion factors in the conversion process. Its rendering of the relationship is non-dynamic however. The conversion framework seeks to map out the different forces (factors, resources, human agent) and their interaction and hence explore the conversion process.

In expounding the framework, we begin with the 'Means to Achieve' which in our case is ICTs, plus other required resources. We are exploring the role of ICTs, factors and resources in realizing functionings people have reason to value. We therefore set them (ICTs) separately in the framework to trace their contribution to the conversion, since this is the heart of our study. The ICTs do not operate in a vacuum – they interact with other resources. We observed above that the Choice framework seeks to map aspects of the agency element by showing the relationship between the resource portfolio (the 'agency-based capability inputs'), and structure. Kleine explains that the interface between structure and agency includes a host of reciprocal and cumulative processes. Agency is thus presented as a mosaic of complex reciprocal processes made up of interactions between aspects of resources and structure. This black box of agency needs to be opened in order to understand conversion and this is what the framework has attempted to do. The framework also captures the importance of the socio-environmental context by having a bidirectional arrow between the conversion factors and the resources and the ICTs. The fact that the social context will influence the personal conversion factors is also captured by having a bidirectional arrow between the factors.

We begin by discussing each of the constructs in the framework. In section 2.2.3, we adopted a definition of ICTs. We also need to be clear on what qualifies to be a resource and what a conversion factor is. Resources are goods or commodities that can be the means to realize a valued functioning. These include material, financial and human resources, etc. A resource therefore needs to be convertible to functionings. The context

is captured through the conversion factors. Personal factors were conceptualized as attributes and characteristics of a person that she can use to enable her utilize resources to realize a functioning she has reason to value. Personal factors are innate or internal to the person. These include mental and physical conditions, literacy and gender (Robeyns, 2005). These could also include age and race/ethnicity. Mental conditions can include cognitive skills and abilities, and cognitive disabilities, while physical condition could include strength, bodily integrity, disability, etc. Social conversion factors represent the social context where the person is living. These entail 'characteristics of social settings, such as social norms (e.g. role of women, rules of behavior, materialism, religion, etc.), social institutions (e.g. rule of law, political rights, public policies), and power structure (e.g. hierarchy, politics)' (Zheng, 2009 pp 3). Environmental factors entail the physical/spatial environment of the person's place. Examples include climate, environmental quality factors (e.g. air or water quality).

Sen (1999, pp 88) stated the following concerning the conversion of income to functionings:

> The relationship between income an capability would be strongly affected by the age of the person, (e.g., by the specific needs of the old and the very young), by gender and social roles, (e.g., through special responsibilities of maternity and also custom-determined family obligations), by location (e.g., by proneness to flooding or drought, or by insecurity and violence in some inner-city living), by epidemiological atmosphere (e.g., through diseases epidemic in a region) and by other variations over which a person may have no – or only limited - control.

It is clear that these personal (age, gender), social, environmental (location, environmental 'quality',) factors will affect the degree of capability that one can get from the income. In certain circumstances (like the case given above), infrastructure can be taken as an environmental factor.

Kleine (2009 pp. 111) describes geography as 'the practical implications of location and relative distances, … also includes the intangible qualities of a location … the mysteries of the trade "in the air" … the "buzz" of face to face contact in the urban economy." In the example from Sen (ibid, 1999 pp88), location is a conversion factor. Depending on the context and situation at hand, even the scenario given by Kleine, geography (location)

can still be regarded as a conversion factor. Robeyns (2005) similarly recommends that geography is a conversion factor What is clearly emmergin is that conversion factors hav a facilitative role in enabling (or affecting) the access, use and effective utilization of resources in pursuing what a person would want to do. This view therefore influenced the distinction between factors and resources.

Psychological 'resources' were similarly not taken up as resources. Cognitive conditions, skills and abilities were taken as personal conversion factors. For freedom, there is need for one to recognize the available opportunities, decide the ones that are valuable and choose the one to pursue. Agency involves decision-making, bargaining and negotiation, deception and manipulation, resistance and subversion and at the cognitive level reflection and analysis. This clearly requires cognitive and psychological abilities and intelligence. These are innate to the person and they clearly are facilitative – they facilitate one to consider the available resources and the access and ability to utilize them given the social and environmental context. We have therefore viewed them as conversion factors.

As for resources, they must be means to achieve a functioning one has reason to value. While some resources like financial, natural, material, health and information are clear and others qualified (e.g. social and cultural) (DFID, 1999; Kleine 2009), others need to be clarified. We have already clarified why psychological and geographical are viewed as conversion factors. Education is taken as a resource. This is taken as knowledge and the ability to apply the body of knowledge for some activity that is beneficial to a person. People that have completed high school and university would be said to have education. Professionals like engineers, architects, lawyers, doctors have education. Similarly people with a trade or vocation like builder, artisans technologists have education. Literacy will therefore not be taken as education as it is facilitative. For each of these professions/crafts, one has mastered a body of knowledge and how it can be utilized for problem solving and service delivery. It is this masterly of knowledge and the way it can be utilized for a purpose that can now be used to realize a functioning either for oneself or for others.

The framework situates agency in between the ICTs, the resources and the conversion factors. At some point an actor has to take a decision whether to take up and use certain ICTs to realize some valued capabilities. This decision will depend on a number of factors including other resources. The social and environmental conditions will determine their ability to access and utilize the resources and whether they will be able to utilize them to realize the desired purpose. These could be legal or institutional issues, norms and discourses on say gender, caste, or they could geographical. For this decision on the opportunity and ability to utilize it and whether it is valuable, they require cognitive/psychological skills or ability. The options on value may well be influenced by personal factors (e.g. gender) and social factors (e.g. norms). It is also important to mention that for agency freedom, they need to have negative freedom (absence of coercion or the ability to decline any opportunity on offer that one has no reason to value, even when it is valuable in the eyes of the benefactor). An example can be a person who desires to take up some ICTs to enable access to ICT-mediated health information or services. If they require financial resources to access these ICTs and they are not able to raise the finances needed then they will not be able to take this decision and hence achieve the health related functioning. Even before the decision on take up, the actor should have been aware about ICTs and what one can do with them. This awareness comes through Information resources. Further, to utilize the ICTs one must have access to them: access to ICTs is a social conversion factor.

To explore another aspect of agency, we look at the decision to use the ICTs. For this to happen, one must have a positive attitude about ICTs and what one can do with them. Some people in certain communities have a very negative attitude about ICTs and believe they can do more harm than good. Such people may not use ICTs, even when they are made aware of the potential they posses to realize some valued functioning. This negative attitude of such people is a mental condition, which is a person conversion factor. For those that have the negative belief about ICTs, this becomes a constraining factor to the achievement of the valued functioning. Sometimes the negative attitude may be there because of the existing discourses about ICTs in the community. Discourses are an example of social conversion factors and in this case they affect the attitude which is a personal factor. This is an example of a social factor affecting the personal conversion

factor. As for the issue of the people being made aware of the potential the technology gives them to realize the valued functioning, it is necessary since the intervention may involve ICTs that are new to the community. Even for those that may be familiar with the technologies, they may not be aware of the fullness of potential that one can exploit to pursue what they valued and have reason the value. Kliene (2009) reiterates this by stating that 'for any piece of research focused on a technology which is new to the respondents, the dimension of "sense of choice" will play a significant role.'

This brief discussion agrees with what Kleine (2009) observes; that agency plays out in cumulative processes involving complex, reciprocal interactions between aspects of these resource portfolio and structure. We can discern reciprocal interactions between resources and ICTs, between ICTs and conversion factors, and between the conversion factors themselves.

The other construct is Freedom to achieve, i.e. the opportunity set of achievable functionings associated with basic capabilities or simply basic capabilities. We observed earlier that according to CA, the objective of poverty reduction should be to expand the freedom that deprived people have to enjoy 'valuable beings and doings' ('functionings') (Alkire, 2005). Capability can thus be seen as a kind of freedom: the substantive freedom to achieve alternative functioning combinations. As for freedom, CA views it as "the real opportunity that we have to accomplish what we value and have reason to value "(Sen, 1992 pp. 31, 1999 pp. 74), and does not therefore include freedoms or opportunities that a person might hold theoretically or legally but in reality lie beyond their reach. Once they effectively have these substantive opportunities, they can choose those options that they value most.

From the ongoing, we can observe that for poverty reduction, what is really required is the expansion of basic capabilities - i.e. the freedom to achieve valued basic capabilities - which is the real opportunity one has. This real opportunity means that the vector of functionings exists. If the functioning is valuable to an individual or household, they will then choose/select to pursue the functioning. At this point there is need for agency freedom and for negative freedom so that they choose what they have reason to value.

For them to choose to pursue/realize the functioning, they must be aware that it exists. We have just mentioned that what is required is the real (not theoretical) opportunity that one has to accomplish what they value - i.e. the opportunity that is within their reach. Once they have a real opportunity (existence of the vector of functionings) they must be able to make the choice. This may mean whether the person is able to exploit the potential functioning (for instance because they are able to access and utilize the means or they have the required knowledge/skill). It could also mean that one is not hindered from utilizing the means (ICTs) because of norms and customs based on culture, or institutions. This ability to make the choice must therefore exist if the person will be able to utilize the potential functioning, and it will clearly affect the ability to achieve the functioning.

We can summarize and say that the 'freedom' that CA anticipates (i.e. the real opportunity one has to accomplish what they value) composes of the existence of choice, the awareness of choice, and the ability to choose. Capability can thus be interpreted in the context of conversion as the existence of choice (potential functioning opportunity), the awareness of choice (what Kleine refers to as sense of choice) and the ability to make the choice. We must hasten to add here that since the opportunity/functioning must be valuable to them, they must possess negative freedom.

Another important aspect to consider during the conversion process is what the starting point is and what triggers the process. A number of the proponents of ICT for development and poverty reduction advocate for the implementation of certain ICTs in communities to enable some livelihoods. The assumption is that once the ICTs are implemented, the poor will find use for them or they will use them for instance to access information that they can use for livelihoods. The early Telecentre initiatives followed this thinking where telecentres were availed to poor communities to enable them get access to information, especially from the Internet. It was assumed that the poor will get the required information to enable them improve their wellbeing. In this and other instances, the starting point is the ICTs and everything else follows.

We set out to investigate whether this stance would facilitate conversion or there was an alternative way. From CA, the poor are deprived of the freedom to pursue/achieve

valuable basic capabilities. From this definition, the poor cannot achieve what they value because of certain deprivations. Poverty reduction in this case will involve the removal of these deprivations so that the poor can pursue what they value. The emphasis and point of takeoff therefore is value (what the poor values). We therefore posit that if one values a certain functioning, they will seek to get the means to achieve it. If the means exist and they are be able to choose to use them, then they will. The framework therefore states that when there is a functioning the poor value, and we avail the ICT means to realize this functioning, and they are made aware of the ICT enabler, and they are also able to pursue it (depending on whether they have the required resources or access) they will pursue and realize it.

When the poor gets aware of the potential valuable basic functioning (through information resources), the social and personal factors will determine what decision is made on the uptake and use of the ICTs and other resources to achieve the valuable functioning. Once the decision is made, and the ICTs are utilized, then the actor may realize/achieve the basic valued functioning (achievement).

The conversion process will therefore be mediated through the conversion factors, will affect the decision to take up and use ICTs and hence put the actor in a potential position to either be able or unable to achieve the valuable basic functioning. Once they then make the decision and take up and use ICTs, they will achieve the valued functioning. Based on the operationalization of CA for poverty reduction by Alkire (2002), we observed earlier that for poverty reduction, the beginning point is the identification of long-term valued capability goals (through participation). In situations where projects and initiatives are being designed to facilitate poverty reduction, the valued capabilities will have to be determined through community participation. The initiatives will therefore be designed/geared to providing the means to achieve these valued capabilities. The achieved functionings (achievement) will therefore be based on these valued capabilities.

3. METHODOLOGY

This chapter describes the methodology the researcher adopted in carrying out the research. This entails describing the design philosophy followed (Section 3.1) and the research design (Section 3.2). The design brings out the steps followed in the research, the identification and selection of research sites, and the data collection. For the data collection (see Section 3.3), the data sources and data collection instruments are described. Finally, Section 3.4 outlines the analysis process.

3.1 Design Philosophy

In terms of strategy, the conduct of this research was qualitative, and was carried out as an inductive study. In an inductive study, theory is the outcome of research (observations and findings). This means that we draw generalizable inferences out of observations (Bryman and Bell, 2003). Review of literature revealed that there was insufficient theory on the conversion process and it therefore seemed logical to adopt an inductive study in order to add to theory on the conversion of ICTs. By theory we restricted ourselves to mid-range theories as opposed to grand theories (Merton, 1967).

As for epistemological considerations, the research is interpretive. Interpretivism is premised on the fact that 'human discourses and actions can be interpreted through deep understanding, empathy or dwelling with the people of one's inquiries or via understanding of group actions and interactions' (Miles and Huberman, 1994). It requires that the social scientist grasps the subjective meaning of social action and hence the social actors and researchers get involved in interpreting of meaning. The interpretivist approach was deemed appropriate because whereas the factors that affect conversion are known, it is clear that conversion involves decisions on what people value to do and to be and the values are embedded in human actors. Further, the decision on uptake and use of ICTs and what one can do with them is very contextual. This indicates the need for a

deep empathetic understanding of the social actors, their actions and their interaction with ICTs, which will also include the researcher interpreting the meaning of the observed social action.

In terms of ontology, this research adopted constructionism. Constructionism asserts that social phenomenon and their meanings are continually being accomplished by social actors (Bryman and Bell, 2003). The people under study have a contextual reality – they live out what they value to do and be and this is manifested as activities and livelihoods. Different people and households will have differing activities and livelihoods, and they adopt different strategies for achieving them. When technologies like ICTs are availed to them, their uptake and use will be based on what they perceive they (ICTs) can enable them to achieve. This perception, understanding and what they use them for will therefore depend on the social actors and their experience. It is thus not possible to separate the social actors from ICTs uptake and use (what they are used for and how they are used) and what influences that. Researchers also 'construct' the social reality they come across based on their knowledge and understanding. Our research therefore adopted the constructivism position. Finally the methods used in the research included microethnography, qualitative interviewing and focus groups.

3.2 Research Design

After selecting qualitative research as our research strategy, we also needed to make decisions on the research design and research method to be used in the study. Research design 'provides a framework for collection and analysis of data,' while a research method 'is a technique for collecting data' (Bryman & Bell, 2003, p. 32). To assist us in deciding on the research design and method, we considered two criteria used for assessing the quality of qualitative research: *trustworthiness* and *authenticity*.(Lincoln & Guba, 1985) and (Guba & Lincoln, 1994).

Trustworthiness is made up of four criteria: credibility, transferability, dependability and confirmability. To ensure credibility, they suggest that the research should be carried out 'according to canons of good practice and submitting the research findings to the members of the social world who were studied for confirmation that the investigator has

correctly understood the social world' (Bryman & Bell, 2003, p. 298). Another technique they recommend for ensuring confirmability is triangulation. Transferability has to do with the researcher producing '*thick description* – that is rich accounts of the details of a culture' (Geertz, 1973). Guba and Lincoln aver that 'a thick description provides others with a database for making judgments about possible transferability of findings in other milleux (Bryman & Bell, 2003, p. 289). On dependability, Bryman and Bell recommend that researchers should keep complete records of all phases of the research process – from problem formulation to selection of research participants, fieldwork notes, interview transcripts, data analysis decisions in an accessible manner. Peers can then act as auditors during the course of the research and at the end to ensure that proper procedures were followed (ibid, pp. 289). Finally confirmability, should ensure that the researcher has acted in good faith and 'not overtly allowed personal values and theoretical inclinations manifestly to sway the conduct of the research and findings deriving from it' (ibid, pp.289).

Authenticity is concerned with fairness, ontological, educative catalytic and tactical authenticity. We restricted ourselves to fairness because we judged that it had an important bearing on the research findings. The fairness criterion asks whether the research fairly represents different viewpoints among members of the social setting. In our case, did the informants interviewed represent the different groups in the community (e.g. male, female, youth older folk, children, etc)? These research quality criteria had a bearing on the research design and method adopted.

We hereby outline the research design and method that followed in the study. We decided to use case study design. Case study research is concerned with the complexity and particular nature of the case in question (Stake, 1995). The major concern of case study researchers is 'how well the researcher generates theory out of the findings' (Bryman & Bell, 2003, p. 56). The type of case that we adopted was the *revelatory case*. The basis for the revelatory case exists when an investigator has an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation (Yin, 1984). Bryman and Bell however observe that a lot of inductive case study research treats single case studies as revelatory.

In our research we opted not for one but a multiple case study. Multiple-case (or multi-case) studies occur whenever the number of cases exceeds one. Researchers claim that multiple-case studies improve theory building (Bryman & Bell, 2003). This takes the form of comparing two or more cases, with a view to establishing the circumstances in which a theory will hold and those where it would not (Yin, 1984; Eisenhardt, 1989). The comparison can point out concepts relelvant to emerging theory ((Bryman & Bell, 2003). For multi-case study, one approach is to select cases that are extreme from each other (e.g. successful and unsuccessful firms, etc.).

Our approach to the multi-case however was different from the scenario described above (in which the cases represent study situations/scenarios that the extreme from each other). We selected two cases that had similarities, and yet were unique. We opted to work with two cases in order to compare them in the process of building theory. A concept that arises in both cases can serve to validate the finding. Once we got a concept (or theme) in one case, we could use the other case to validate it. Where we got concepts and themes from the two cases that differed, we looked for the circumstances that brought about the difference. Further, the different cases (with different informants, trainers and locations) ensured the study space was larger, giving us the likelihood of getting richer findings than if we had one location.

Figure 3.1 shows the steps that we followed during course of the study. We outline each of the steps as a way of explaining how the research design and method were realized.

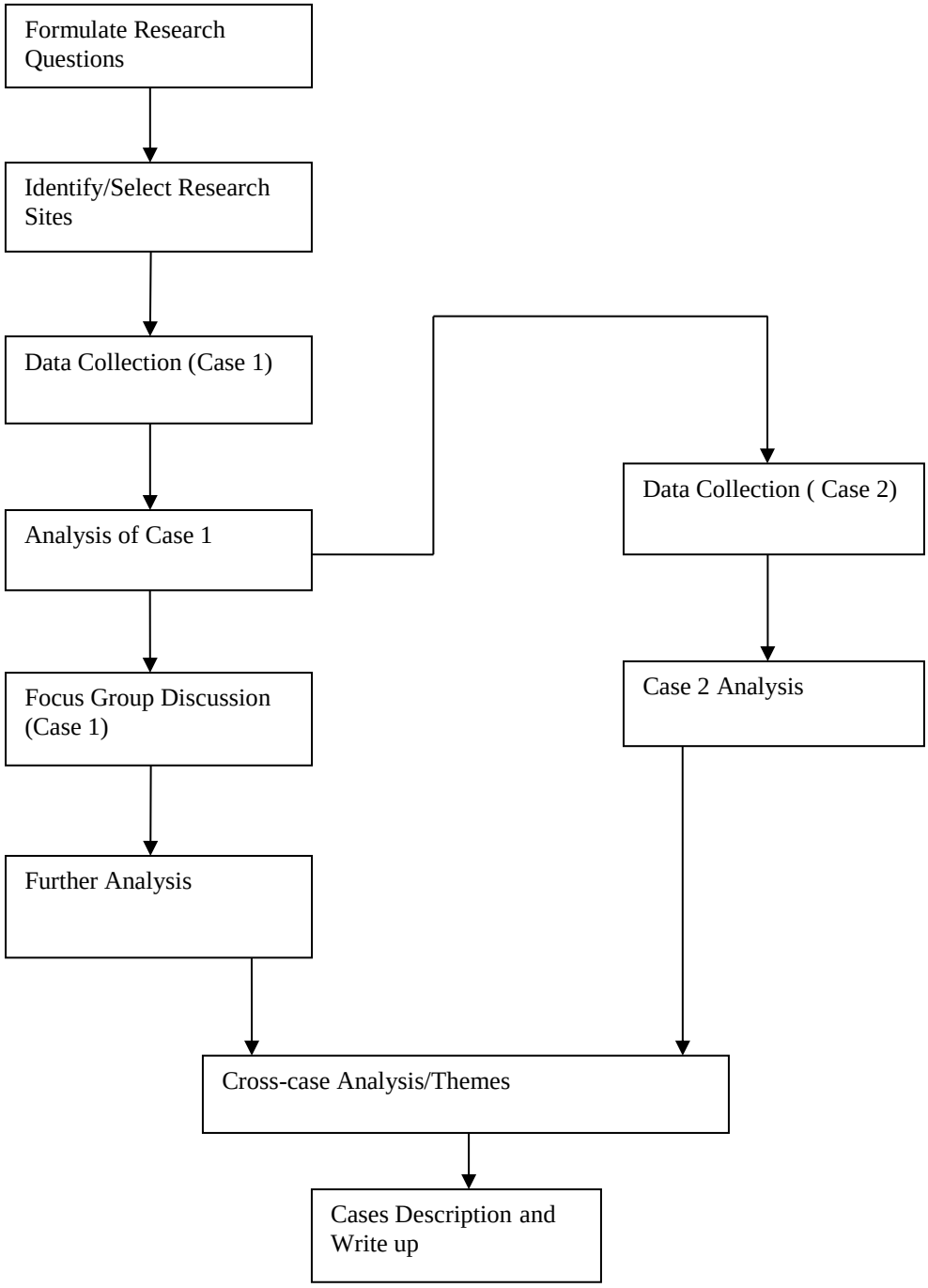


Figure 3.1: Research steps (Source: Research)

3.2.1 Step1. Formulate research questions.

After reviewing literature on poverty reduction, ICTs-for-poverty-reduction, CA and conversion, we identified gaps in theory and hence areas that require exploring. This led us to formulating research questions that guided this study.

3.2.2 Step 2. Identification and Selection of Research sites

Because our study involved exploring the conversion of ICTs to basic capabilities, we looked for research sites (projects) where ICT intervention had been implemented in a poor community. Another criterion we used was that the intervention was accessible to, and had been taken up by the community, as demonstrated by having an appreciable number that use it for their livelihoods, and the intervention was perceived to improve the wellbeing of the users in the community. We also ensured that we would get access to the site and the "gatekeepers" to the community project/ICT intervention were willing to allow us get information on the project (by allowing us get access to project documentation and project staff). Further, they helped us identify beneficiaries of the community project that were willing to be involved in the study, and contacted, negotiated with, and arranged meetings with them.

Having made the decision to have a multi-case study with similar cases, we got two cases in Siaya County. The cases had similar interventions – ICTs basic skills training administered by local organizations. Both projects had external funding, and in the beginning the training was free. The communities (where the 2 cases are located) are similar in terms of ethnicity, poverty, and other social indicators since they are are both in Siaya county, and are 14 kilometers from each other along the Kenya-Uganda Road. As for their disimilarities,they are adminstered by different organizations, one which is a foundation and the other a local NGO.

The first case (Case 1) was a basic ICT skills training project at Ugunja Township in Siaya County, Western Kenya. The project was administered by an NGO - Ugunja Community Resource Centre (UCRC) - and was fully funded by Microsoft Corporation, making it free and hence accessible to many in the community. The NGO was respected in the community and this gave us access to the beneficiaries. Further, the area has a high incidence of poverty. This is described in detail in chapter four.

The second case (Case 2) involved Sega Silicon Valley (SSV) - a community-based project at Sega township, (in Siaya county), funded by Simba foundation - a not-for-profit organization that was started with the sole aim of assisting the community address different challenges and improve their well being. SSV had implemented different projects in the community, and studied the computer basic skills training project. There is high poverty incidence in Sega, and many had benefited from the projects over the last number of years. Because SSV is well respected by the community, access to the beneficiaries was assured. The details of the project are found in Chapter 4.

3.3 Data Collection.

3.3.1 Data Collection Strategy

Our data collection strategy was informed by the qualitative research quality criteria of trustworthiness – credibility, transferability and dependability. In section 3.1, we observed that one of the techniques for ensuring credibility was triangulation. We therefore opted to collect data from different sources, using different methods. We collected data about the people, the projects and the implementing organizations from documents, reports and web content that the implementing organizations had. We also chose to use different methods for collecting data. For transferability, the recommendation is to use thick description. For the purpose of triangulation and transferability, we opted to use three methods of data collection: microethnography, in-depth semi-structured interviews and a focus group. 'Microethnography occupies a middle ground between a limited case study on one hand and a full-blown ethnography on the other (Shank, 2006). In it the researcher goes into a setting but not for very long and focuses on a few pre-determined characteristics of the settings.

For data collection, we visited the cases at three different times over a one and a half year period. For each of those times we lived among the people, and interacted with them, observed their way of life and livelihoods. We stayed in different places, took meals in the townships and conducted interviews in people's working places/businesses as we observed them. We also took walks in and out of the townships, rode in their bicycle and

motorcycle taxis and local public transport system. The interviews took different flavours: there are times where we interviewed people in the work places and businesses, at the implementing organizations' premises, in restaurants and on the streets. On the third visit, we conducted a focus group with a number of respondents to clarify some of the issues that had arisen during interviews in earlier visits. The respondents were drawn from earlier interview cohorts. Collecting data from different sources on three occasions over a one and a half year period using different methods ensures that we got 'rich accounts of the details of the culture' of the community (Geertz, 1973).

Data collection was done using observation guides, interview guides for the management of the implementing organizations, interview guides for the training beneficiaries and focus group discussion guide (see Appendix A, B and C). The first wave of data collection involved a preliminary interview with the management of the implementing organizations to establish the viability of the two cases. The first wave interviews were used to establish that the projects had the required study aspects, including exploring whether there were poor people that had gone through the projects and benefited and if their lot had improved. We also needed to establish access issues. This involved getting information on the project, the history, the implementation and the outcomes, the organizations, and the availability and willingness of the beneficiaries to take part in the study. Still on the first wave, we did observations on the organizations, the townships and environs, and reviewed available documents, like reports and the websites. Also on this wave, we requested the implementing organizations to help identify the study subjects and negotiate their willingness to take part in the study and their availability.

The next wave involved in-depth interviews of the subjects, the management of the two organizations and a review of available documents. In the second wave, the data collection was done case by case. After the first case, transcription and analysis was done and emerging areas needing further investigation were identified, and these were included in the data collection instruments for the second case (project 2). Further, a focus group was conducted on the first case to clarify some of the issues that arose in the first data collection. Data collection was then carried out on the second case. The interviews were mostly carried out where people worked or had their businesses. It was therefore possible

to make observations about the people, their work and their claims about functionings they had reason to value: the opportunities open to them, ones they had achieved and further opportunities these had opened for them. The time spent with each informant was between 1 to 2 hours, with a number taking a little longer depending on the issues being pursued. As mentioned above the main data collection instruments were the observation guides and the interview guides. These were supplemented by available documents from the organizations.

As the interviews went on, it soon became clear that it was not easy for the informants to recollect how agency was exercised. Many of the respondents did not seem aware of how decisions were made on the utilization of ICTs – in view of the effects of the socio-environmental context – to realize the functioning they valued. Replaying the exercising of the cognitive capacities to realize what they wanted to from the ICTs and how this was arrived at seemed difficult to recollect or perhaps for some it may have been done unconsciously. At such times we opted for giving the informants scenarios to describe. After capturing the initial information, we led the informants to story-telling and scenario recounting.

3.3.2 Informants

In section 3.1, we observed that to ensure authenticity of qualitative research, there was need for fairness. In the criterion of fairness, we ensure that viewpoints from different members of the social setting is taken on board. For fairness, we tried to ensure that the informants were representative of the various groups in the community. Even though it was the implementing organization that identified, contacted and negotiated with the training beneficiaries, we tried to see that among the informants were mixed. There were young and old people, male and female, students and working people, employees and business people, civil servants and private sector workers. Tables 3.1 and 3.2 below give a description of the various informants selected for the two cases and the interview dates.

Table 3.1: UCRC Case Informants

	Informant	Description	Interview Date
1	Bureau Owner	A male in his twenties, he got trained at UCRC after completing secondary school. He later worked for two different ICT bureaus before starting a bureau of his own where he provides services like typesetting, printing, simple applications troubleshooting, simple Internet related services and basic ICT literacy training.	14th August, 2012; 7th December 2013
2	Bureau Worker 1	A female in her twenties, she enrolled at UCRC for the training immediately after completing secondary school. After the training she got employed at a local ICT bureau where they provide some services like typesetting, printing, photocopy and binding, selling of stationery. She also does book keeping for the bureau using an accounting software application.	14th August, 2012; 7th December, 2013
3	Bureau worker 2	A female in her twenties, she trained at UCRC after completing secondary school. She works at a Computer bureau in Ugunja town where the services they provide include printing, typing, binding, etc.	14th August, 2012
4	Bureau Trainer	A male in his twenties, he attended the basic ICT skills training after completing secondary school. He later got employed in a local ICT bureau where he is an ICT literacy trainer.	14th August, 2012
5	Office Assistant	A male in his twenties, he attended the training at UCRC immediately after completing secondary school. He worked briefly at a computer bureau before getting some work in a law firm near Ugunja town where he works as an office assistant and ICT assistant. His work involves assisting the legal personnel with any computer related work like case notes preparation, documents archiving, report preparation and other simple computer related tasks.	14th August, 2012
6	Accounts Assistant	A male in his mid twenties, he attended the training at UCRC, and later proceeded to Maseno University to pursue a Diploma course in ICT. He later got a job as an accounting assistant in a law firm near	14th August, 2012

		Ugunja town where he utilizes the ICT skills in his accounting work and for personal tasks like communication and information search	
7	Civil Servant 1	A male in his forties working as a civil servant at the ministry of finance county offices. After training at UCRC he started a cybercafé and bureau in Siaya town, and employed some operators. Being among the first few bureaus in the town, it used to provide typing services, printing, Internet access for a fee, photocopy and binding, etc.	15th August, 2012
8	Civil Servant 2	A male in his thirties working in the Ministry of Works and Roads, Siaya offices. He trained at UCRC and later got a job with the ministry where his job involves user support, simple applications troubleshooting, office assistant work, typing, etc.	15th August, 2012
9	NSSF Worker	A male in his forties working at the National Social Security Fund (NSSF) offices in Siaya town. Was trained at UCRC where he attended the training in the evening after work. He utilizes the skills in his work and also for personal work like communication and information access.	15th August, 2012
10	Projects Officer	A male in his thirties, he doubles up as the officer facilitating and overseeing the planning for, implementation and operation of ICT-related projects at UCRC. He was also involved in the training of the people during the project.	14th August, 2012; 6th December 2013
11	Director	A male in his fifties, he was the visionary and founder of UCRC from its humble beginnings. He is involved in the general management of the centre and also in public relations and fundraising. He is a passionate believer in the potential of ICTs to uplift the wellbeing of the community.	17th August, 2012; 6th December, 2013

Table 3.2: SSV Case Informants

	Informant	Description	Interview Date
1	Informant 1	A male student at Maseno university, he is his early twenties. He was trained at SSV after completing his secondary school, and utilizes the skills gained for learning and for making an extra buck to supplement his upkeep at the university.	3rd December, 2013
2	Informant 2	A male in his early twenties, he hails from a 'materially-challenged' family and after completing Secondary school got basic ICT training at SSV. Presently is a volunteer at SSV's Community Knowledge Centre (CKC) at Kogere Primary school where he is a basic ICT training instructor.	2nd December, 2013
3	Informant 3	A male in his mid forties, he is a self-employed, informally trained Electrical fitter at Sega. He has low education, having only completed primary school. Uses the ICT knowledge in his work.	2nd December, 2013
4	Informant 4	A female Maseno university student in her early twenties. She went through the basic ICT skills training at SSV after completing Form Four. The skills she got enables her to assist her classmates at the university in IT, while during the holidays she alternates between volunteering as a trainer at SSV and working in a computer Bureau /cyber cafe'.	2nd December, 2013
5	Informant 5	A female in her early twenties, she trained at SSV after her secondary education. She works in an NGO that deals with empowering youth and women and assisting in improving sanitation. She does secretarial work, donor research, proposal compilation and budgets for the NGO.	4th December, 20013
6	Informant 6	A male former trainee of SSV who has been working at a local health CBO as the ICT services provider. Did the training after completing form four and has recently enrolled in Kisumu Polytechnic University College to pursue Electrical Engineering. He is in his mid twenties.	3rd & 4th December, 2013
7	Informant 7	A female former trainee of SSV, she has worked in a cyber cafe and presently works in Sega township in a small firm offering agent banking,	5th December 2013

		mobile money services, ICT Training and construction information, where she is the sole employee providing services to the public. She is in her mid twenties.	
8	SSV Manager	A male in his mid thirties, he coordinates the training at SSV and is generally in charge of the different projects of SSV. He initially was in charge of training at Kogere Community Centre, based at Kogere Primary School.	3rd December, 2013, 5th December 2013

3.3.3 Data Collection Instruments

The main document used was the Interview guide, much as it was supplemented with the observation guide (Appendix A and C). From the research questions, the conceptual framework and the corresponding areas of inquiry, we came up with a preliminary coding schema (Table 3.3), which was later refined and informed the design of the interview guide questions used for case 1 (see Appendix A). The interview guide was a set of logically-flowing questions that closely followed the areas of inquiry. The interview guide led the interviewing but each interview was unique depending on the informant and the issues that would arise. The probing therefore followed the general guide but the informants were encouraged to tell stories of their experiences and clarification sought on the issues arising. Each interview took between 1 hour and 2 hours. After case 1, the emerging issues were used to further refine the coding schema and interview guides for case 2 (see Appendix B).

Apart from the interviews, contextual data was collected on the case environment, including the towns and surrounding areas. This included observation on the businesses, livelihoods, indications of poverty, and ICT businesses. Statistics were also sought on the population, demographics, and poverty for the two townships and environs, and at the constituency and the larger county level. The statistics came for the Kenya National Bureau of Statistics.

Table 3.3 Coding Schema

Capability Input	Preliminary Code	Codes Description	Research Question
Resources			
	ICT-Characteristics	Description of the ICT Interventions and their characteristics	Qn. 1
	ICT-Effect	Effect / Influence of ICTs on other resources	Qn. 1
	Resource-Effect	Effect of the resources on the ICTs	Qn. 1
	ICT-Resource-Interact	Interaction of the ICT and Resources during conversion	Qn. 1
Conversion Factors			
	Factor-ICT-Inf-Factor -Pers	ICT Influence on Personal Conversion Factors	Qn. 2
	Factor-ICT-Inf-Factor -Soc	ICT Influence on Social Conversion Factors	Qn. 2
	Factor-ICT-Inf-Factor -Env	ICT Influence on Environmental Conversion Factors	Qn. 2
	Factor-Pers-Factor-Inf-ICT	Personal Conversion Factors Influence on ICTs	Qn. 2
	Factor-Soc-Factor-Inf-ICT	Social Conversion Factors Influence on ICTs	Qn. 2
	Factor-Env-Factor-Inf-ICT	Environmental Conversion Factors Influence on ICTs	Qn. 2
	Factor-Pers-Factor-Inf-Resource	Personal Conversion Factors Influence on Resources	Qn. 2
	Factor-Soc-Factor-Inf-Resource	Social Conversion Factors Influence on Resources	Qn. 2
	Factor-Env-Factor-Inf-Resources	Environmental Conversion Factors Influence on Resources	Qn. 2
	Pers-Factor-Resource-Inf	Resources Influence on Personal Conversion Factors	Qn. 2
	Soc-Factor-Resource-Inf	Resources Influence on Social Conversion Factors	Qn. 2
	Env-Factor-Resource-Inf	Resources Influence on Environmental Conversion Factors	Qn. 2

	Factor-Factor-Inf-Soc-Pers	Effect of Social Conversion factor on Personal Social conversion factor	Qn. 2
	Factor-Factor-Inf-Soc-Env	Effect of Social Conversion factor on Environmental Social conversion factor	Qn. 2
	Factor-Factor-Inf-Pers-Env	Effect of Personal Conversion factor on Environmental conversion factor	Qn. 2
	Factor-Factor-Inf-Pers-Soc	Effect of Personal Conversion factor on Social conversion factor	Qn. 2
	Factor-Factor-Inf-Env-Pers	Effect of Environmental Conversion factor on Personal conversion factor	Qn. 2
	Factor-Factor-Inf-Env-Soc	Effect of Environmental Conversion factor on Social conversion factor	Qn. 2
Conversion Process	**Conversion**		
	Convert-Function	Potential Valuable Functionings	Qn. 3
	Convert-Aware	Awareness of Potential Valuable Functioning Choices	Qn. 3
	Convert-Decision	Decision on Valuable Functioning	Qn. 3
	Convert-Ident-ICT-Potential	Identification of Potential of ICTs to expand valuable functionings	Qn. 3
	Convert-Ability-Choice	Ability to make Valued Choices that enable ICT-enabled valued functionings	Qn. 3
	Convert-Factor-Role	Factors Role in Conversion	Qn. 3
	Convert-ICT-Role	ICT Role in Conversion	Qn. 3
	Convert-Resource-Role	Resources Role in Conversion	Qn. 3

3.3.4 Data Management

On dependability of qualitative research data, (Bryman & Bell, 2003) recommend that researchers should keep complete records of all phases of the research process – from problem formulation to selection of research participants, fieldwork notes, interview transcripts, data analysis decisions in an accessible manner. To this end, we came up with a data management strategy and designed a comprehensive repository of the cases data (See Appendix D). The organization of the repository followed the data coding schema. There were two cases and the data for each case was stored in a different folder. For each of the case folders, there were two sub-folders - one for the recorded sound files and the other for storing the analysis data. Transcription for each informant was stored in a file. All the transcription files for a case were stored in a folder. In that same folder, we stored a file with observation of the environs, and another file for the summary of the available documents in the NGO. Because the transcribed data was ordered by the schema - which was ordered by the research questions - it was possible to sub-divide and group the transcription content into the different areas of inquiry for each informant. The transcription content for each of the areas of inquiry in each of the informant files was copied and all the content for each area stored in a single file, which was stored in a subfolder in the folder storing the informant transcription files. The new sub-folder therefore contained five files - one for each broad area of inquiry (ICTs, Resources, Conversion Factors, Capabilities, and Conversion). For each of these five files, a mirror image was created for coding purposes. The folder therefore contained ten folders. With this storage structure being done for each case, access for the required content was predictable, straight forward and easy.

Apart from the digital data repository, we also kept a physical repository where we stored all the physical documents like reports, documents, field notes, memos, etc.

3.4 Analysis

Analysis involved going through the transcriptions and identifying concepts and themes and exploring how the themes are related. Interviews were all recorded and the transcripts done by the researcher after the interviews. This allowed the researcher the proximity to the data. We therefore got raw transcripts of the data interviews and observations and it

was reviewed and stored. To give an illustration, in section 3.3.4, we described the data repository. At the lowest level in the hierarchy of stored documents, we had a subfolder with ten files (five for each of the general areas of inquiry according to the conceptual framework, and their mirrors for coding purposes). For each of the content in the five files, the questions and answers were coded according to the coding schema. To illustrate, we look at research question 3 where we have an area of inquiry called 'Interaction between ICTs and Conversion Factors during Conversion.' There were questions based on this area and the emerging answers and stories (merged for all informants per case) would be coded to reflect this. The transcribed data in all the five files was this coded to reflect the area of inquiry. The researcher went through the coded questions and answers and grouped (clustered) similar issues for each of the preliminary codes.

For each general area of inquiry (say conversion), a table was constructed for each sub-area of inquiry (for instance conversion factors). The columns of the tables were the transcription content, preliminary concept, and refined concept (See Appendix E). The rows carried each of the transcription content. The content was analyzed for emerging issues which were then refined and emerging sub-themes captured. Since close/similar content was stored close together, it was possible to see emerging themes and be able to group them together. From this table, we distilled a summary table for related concepts and themes for each area of inquiry (see Appendix F). This summary table acted as a pointer since it had the themes and the corresponding concepts, with an indicator of the row number in the original table. Since the row would have the emerging issues and the original subscription, the two tables provided the guide for an authoritative written account of the case. As the written account unfolded, relationships between constructs and variables emerged and this led to relationship displays. We mentioned earlier of the strategy that was taken early in the research design to use the case 1 analysis results to refine the coding schema and hence the interview guide for case 2. Thus, after Case 1 analysis, the emerging themes and patterns were further investigated through a focus group. They were also pursued further in the Case 2 data collection and analysis. This was done by refining the preliminary coding schema and the interview guide for case 2. Lastly the resulting themes and patterns for the two cases were then compared to observe the emerging picture of the conversion process.

As we mentioned in section 3.3.1, recollecting and describing the decision-making process to realize what in the ICTs has the potential to enable valuable functioning opportunity proved difficult for most informants. Further, the socio-environmental context was not easy to inquire about because even though it's effects are compelling, and all encompassing since they frame want is possible and what is achievable, they are not immediately 'visible' and the informants may not even be aware. To give an example, bureau owner can only describe how he set up the business but may not be able to realize that the affordability of the computers, the availability and affordability of Internet services are affected by the ICT policies enacted by the government, and the rules established by the regulator. This coupled with the difficulty they had to recollect the decision-making mechanisms makes the analysis that much harder. It would help if a full ethnographic approach was utilized so that as one gets immersed, they will be able to get an empathetic appreciation of the interactions between the ICTs and resources and how they are affected by the social and environmental factors and how the person utilizes the personal factors to recognize the opportunities enabled by this interaction.

4. CASE DESCRIPTIONS

4.1 The Setting

This research explored two cases: the basic Computer Skills training project housed at Ugunja Community Resource Centre (UCRC) (which is Case 1 in our research) and the Computer Introduction and Skills training project at Sega Silicon Valley (Case 2 in our research). Ugunja is situated 15 Kilometers from Siaya county headquarters, and 108 Kilometers from Kisumu, along the Kisumu-Busia highway. Sega is located 14 kilometers from Ugunja, along the same Highway. Both places are in Siaya County

Siaya County is one of the counties in the former Nyanza Province in the southwest part of Kenya, next to Lake Victoria. It is bordered by the counties of Busia to the north, Kakamega and Vihiga to the northeast, Kisumu to the southeast and by Homa Bay to the South (across the lake). The total area of the county is approximately 2,496.1 km². The county lies between latitude 0° 26' to 0° 18' north and longitude 33° 58' east and 34° 33' west. It constitutes 5 constituencies (Ugenya, Alego, Gem, Bondo and Rarieda **)** and has a total population of 842,304 and 199,034 Households. (Opendata, 2014).

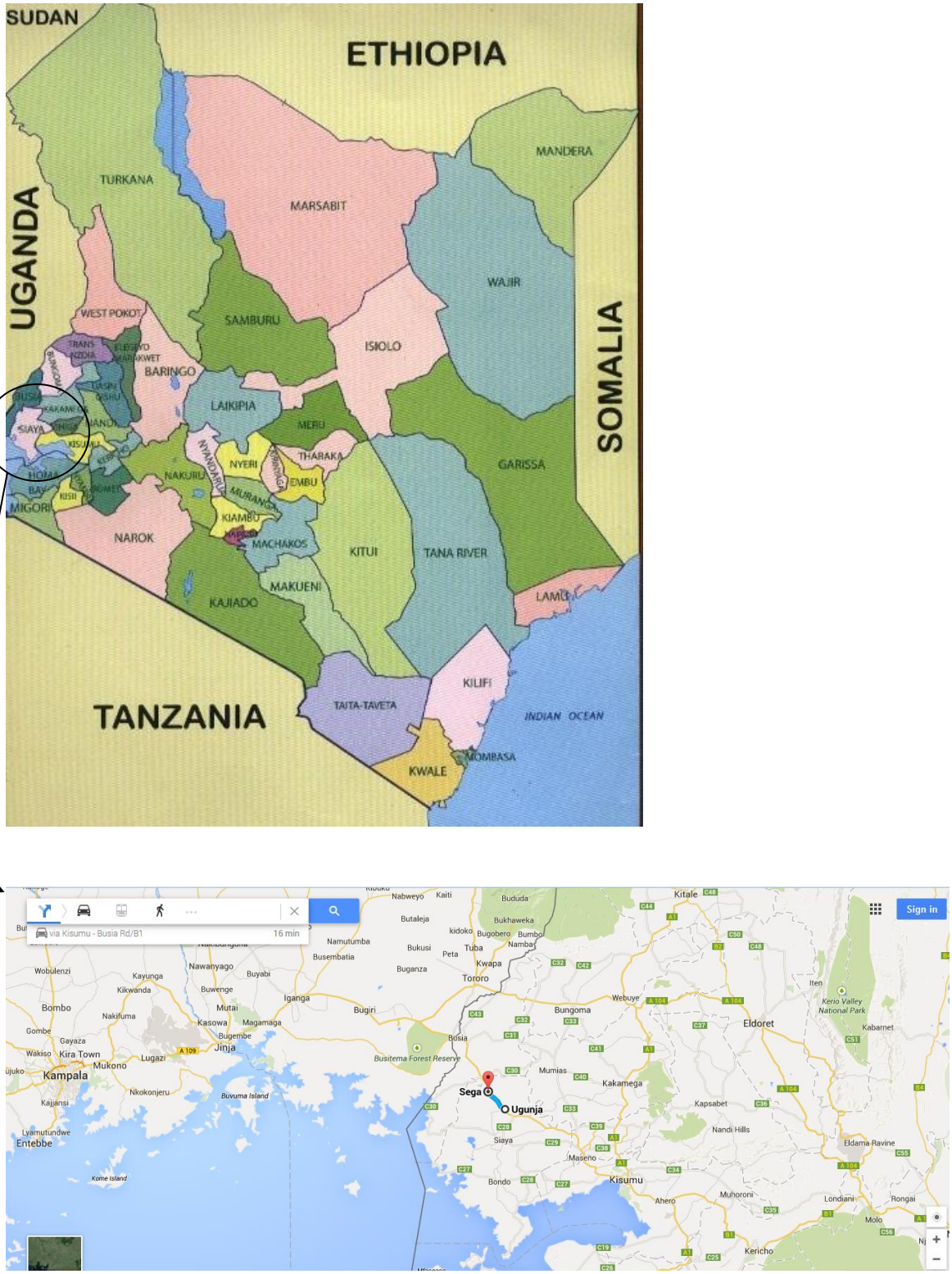


Figure 4.1: Ugunja and Sega. Courtesy of Map Data (c) 2014 Google

Since the two projects are situated 14 kilometers apart in Siaya County, will start by giving a brief overview of each of the two townships (Ugunja and Sega) and then briefly explore Siaya County where they are situated.

4.1.1 Ugunja Township

Ugunja is in the Southern part of Ugenya constituency next to the border with Alego Constituency. The township therefore clearly serves people from the two constituencies. The nearest larger urban centre is Siaya Town, where the county headquarters are. There are many civil servants who work in Siaya, with some commuting from Ugunja Township and its environs. Ugunja is your typical rural Kenya Township where most of the shops and businesses are located along the main highway. There is however an emerging development of businesses along the inner roads. The town merges closely with rural homesteads and small parcels of land.

The township has a very active business environment. There is a fast-paced look everywhere unlike a rural township. Apart from the familiar street-lined shops along the highway, the town has clearly expanded and grown into the side roads. There are all manner of shops with myriad types of businesses, including banks and agent banking outlets, restaurants, hardware shops, well-stocked shops selling household items, etc. Hawkers selling various wares compete with sidewalk clothes shops selling new and second hand clothes and foot wear. There are also sidewalk food-dispensing individuals, and micro-businesses selling different wares. There are many bodaboda[3] operators who are quite busy.

The town is surrounded by small-scale/subsistence farming parcels where there are different types of crops. Most of the farming involves foods crops (including maize, sorghum and millet), with no cash crops observed. Further interview of the locals confirm that majority of the people are involved in subsistence food crops farming. A number of the homesteads also have a few milk cows. Observations indicate that people in the community are deprived of things that are valuable to them. Many households have poor

[3] Bodaboda are motor cycle taxis,

mud-walled grass-thatched huts. Majority of the population are subsistent food crop farmers with very small parcels of land. Plants grown include maize, sorghum and millet and the plants are unhealthy and stunted. Dressing for many is poor with some having dirty tattered clothes, which is unusual in an age where second hand clothes are available at a reasonable cost even for rural populations. CA defines poverty as basic capability deprivations. Clearly, food, clothing and shelter are valued functionings for most people irrespective of nationality, location or culture. This therefore is indication that poverty is a problem in the area.

4.1.2 Sega Township

Sega Township is a typical Kenyan rural market centre running along both sides of the Kisumu-Busia Highway. Most of the shops are very old and a number (one in every two) are clearly not in use presently. There are different kinds of wares being sold in the shops and on the sidewalks, including normal household supplies. There are also hawkers that sell cereals and foodstuffs (both green and cooked, including roasted maize, sugarcane, fish, etc). In addition there are maize mills, mobile money outlets, one or two agent banking outfits, small hardware shops, bars and restaurants and a myriad of cheap lodging places for hire. In addition there are a number of small-scale hawking businesses on the sidewalks.

The SSV website describes Sega thus '... Sega village, a remote village of over 10,000 inhabitants located in Ugenya district – 25 km from the Kenya- Uganda border ... Sega is ... characterized by high incidences of poverty and HIV/AIDs; low educational levels in primary and secondary schools; escalating youth unemployment; over reliance on subsistence farming (thus lack of income generating activities)' (SSV Website, 2013). The population of the town clearly comes from the environs and is not affluent and the shops and hawking businesses mostly sell products and goods in very small proportions. The main livelihood in the environs of the township is small-scale subsistence farming. Closer observation reveals small parcels of land, with unhealthy and stunted maize and sorghum, and no cash crops. In addition, there is very little commercial activity. The people are very poorly dressed, with some walking barefoot. Some people in the community, especially the children, look malnourished. The homes are quite poor, and a

number are small mud-walled, thatched-roofed huts. Some households own a few head of cattle, but with the small parcels of land feeding them is a challenge. Again, these are a testament to poverty since clearly the functionings the people are deprived of are valued.

4.1.3 Statistics on the Poor and Poverty - Ugunja, Sega and Environs

CA defines poverty as basic capability deprivation or failure. Because CA is deliberately ambiguous and still undergoing operationalization, CA-compliant data in public statistical sources is not readily available. The only data that was available uses consumption as a proxy for wellbeing. CA views consumption or opulence not as ends in themselves but only as means to the end, which are capabilities. We have therefore used the criteria of consumption well aware that it is a proxy for wellbeing and hence only an indirect pointer to capabilities.

This data came from two reports from the Central Bureau of Statistics of the Ministry of Planning, Kenya, that were based on the analysis of data from the Kenya Household Integrated Household Budget Survey (KHIBS) of 2005. The reports were the 'Constituency Report on Wellbeing' and 'Who are the Poor? A Constituency Level Profile Volume II' (KNBS, 2007). The reports adopt a monetary poverty line that represents the cost of basic basket of goods that provides a minimum nutritional requirement (of 2,250 calories per adult equivalent per day) and basic non-nutritional goods. Poverty Incidence is defined as the share of the population in a given area whose consumption is below the poverty line. The Poverty gap is a measure of the depth of poverty – 'the average expenditure short fall for the poor in a given area relative to the poverty line.'

Table 4.1 summarizes the rural poverty incidence and urban poverty incidence for the two constituencies (Ugenya and Alego) where the two ICT projects/interventions studied were based.

Table 4.1: Poverty in Ugenya and Alego Constituencies (Source: KNBS, 2007; KNBA, 2008)

	Rural Poverty			**Urban Poverty**		
Constituency	Poverty Incidence (%)	Poverty Gap (%)	Number of the Poor	Poverty Incidence	Poverty Gap	Number of the Poor
Ugenya	60	21	101,165	89	46	3,411
Alego	67	23	99,380	87	44	10,925

From the table, it is clear that poverty is a problem in Ugenya and Alego. The rural Poverty Incidence (percentage of individuals below the poverty line) for Ugenya and Alego is 60% and 67% respectively while urban poverty incidence is 89% and 87% respectively. The rural poverty gap (depth of poverty – 'the average expenditure short fall for the poor in a given area relative to the poverty line) is above 20% and the urban poverty gap is above 40% for the two constituencies. The number of the poor is also quite high for the two constituencies. Further, compared to other constituencies in the larger Nyanza, Ugenya and Alego were among the highest contributors to overall poverty in the province, contributing more than 4% each (KNBS, 2007; KNBA, 2008).

On human poverty, among other provinces in Kenya, Nyanza had the highest levels of both under-five infant mortality (149 per 1000) and infant mortality (95 per 1000) by 2009. The depth of poverty in Nyanza gets clear when we compare the province with Central province which lowest under-five infant mortality (51 per 1000) and infant mortality (42 per 1000) (KNBS, 2010). This trend has not changed much over the years and by 2014, it was reported that infant and child mortality rates in Nyanza were persistently higher than the national average (Health Ministry). The above data on poverty and infant mortality rates point to the fact that poverty is clearly a problem in the constituencies of Ugenya and Alego, and by extension in Ugunja and Sega, where the two projects studied are situated.

4.2 Description of the Cases

After looking at the setting of the cases, we give a background to each of the cases. We describe the beginning, the rationale, the planning, the implementation and the initial outcomes.

4.2.1 Case 1: Ugunja Resource Centre (UCRC)

4.2.1.1 The Genesis

Ugunja Resource Centre began as a community information access and sharing initiative. In the beginning, the centre facilitated meetings of community members for the purpose of exchanging ideas on their agricultural challenges, problems and techniques. The meetings were initially held in each other's homes. With time they formed a group to learn information and skills on food security. The members then donated reference materials that later became a community library. While some could access and read the books, others volunteered to read the books and share the information with the illiterate members of the community. In 1997, the centre registered as a Community Based Organization (CBO), and seven years later, the status changed to a Non Governmental Organization (NGO). All along, the centre sought to enhance collaboration and partnership with research organizations, government departments, and various other NGOs and groups, with a view to training and skill impartation to the community, not only in Ugunja but to the larger Siaya. The trainings have over the years expanded from the original agricultural information to include inorganic agriculture, health, disabilities, education, youth and children's advocacy, gender issues, information technology and peace building. With time UCRC has grown and presently 'is a membership-based organization, whose members comprise more than sixty local community groups, including vulnerable groups such as Persons with Disabilities (PWDs), support group for people living with HIV/AIDS, Women, Youth, church-based groups, and farmers' groups' (UCRC Web, 2012).

4.2.1.2 Objectives

It all started when the management of UCRC identified the increasing importance of ICT skills and realized a number of the staffers were not literate. They sought for a way to roll out training for their staff. As they were working out the logistics of the training, their members and partners requested that they be included in the training initiative.

> "We showed the interest because by then quite a number of staff at UCRC had computer literacy limitations. So the original idea was how do we ensure all our staffs get literate? But then again there were our partners - they would come and say how can we get computer know-how?" (Director)

The computer literacy of staff at UCRC was mixed. The management of the centre and some of the staff had some knowledge of ICTs. A number were quite experienced in using ICTs (e.g. project officer). The centre had many staff, including field staff and some had not been exposed to and had not used ICTs.

With time the government rolled out the e-government strategy and began insisting on government information and services being accessed through the Internet. This confirmed to the management of UCRC the importance of basic ICT training for their members and they even felt they should facilitate training even to the community so that the community would have people to upload information onto the government sites.

> "We targeted Ugunja and Siaya; at the time Siaya was the district head quarters and we had wished to bring up a pool trained persons because of e-government and the pool could upload information unto the Internet." (Director)

UCRC later identified ICTs as candidate channels of information dissemination and service delivery to the community but realized that the majority of the population in the community was not ICT literate. They therefore sought out organizations to assist to roll out Computer skills to the community. Computer for schools Kenya (CFSCK) and Microsoft entered into a partnership with UCRC, enabling affordable computer training and services to the community. Starting in 2004, UCRC partnered with CFSK who provided the computers to enable the training to commence.

> ... The goal of the project is to provide affordable computer training and services to the community, which will bring IT knowledge closer to the people. (Van Groen, 2007)

Between 2004 and 2006, they worked with CFSCK and began the ICT basic training. With the initial training, it became apparent that the need was greater than anticipated: most of their partners and the whole community clearly needing the training.

After running the original training with CFSCK for some time, UCRC in 2006 sought and received a Microsoft Unlimited Potential (MUP) grant to support Community Technology Learning Centers.

> ... So when we approached Microsoft they had some funds which they supported us with and we thought by doing that we will help a lot of people in the community to do research, to interact with ICTs and get information for their everyday lives. (Director)

The grant involved funding for the purchase of the computers, the provision of the Microsoft Office suite of programs, training space (rooms) rent and the hiring of the trainers. These grant-supported Community Technology Learning Centers had the primary role of providing free ICT training to young people, women and other underserved people around Ugunja, Siaya town, the larger ugenya and other surrounding constituencies of Siaya county.

The intention was to reach as many persons as possible, in the identified groups, and train them in basic computing skills. This first phase of the project ran for three years and did not limit itself to the youth and the women – all who came for training were accepted, including the men. Since the grant was unlimited and the training free (except a committal fee of Kenya Shillings 100), as many as came for training in the community were served (See section 4.2.1.8 for numbers).

4.2.1.3 Content/Curriculum

The training curriculum covered a number of skills, which included introduction to Computers and operating systems, among others. Being a Microsoft funded program, the operating system introduced was Microsoft Windows. Other skills included basic word

processing skills with MS Word. The training also included exposure to the basic features of spreadsheets and Microsoft Excel was used for this. The trainees were also taken through the basic steps of presentation with Microsoft Power Point. Some basic database skills using Microsoft Access were also introduced. Another skill taught was desktop publishing that was illustrated with Microsoft Publisher. The trainees were also taken through Introduction to Internet.

4.2.1.4 Target Group

After the original training of UCRC staff and the staff of the members/partner community organizations, UCRC embarked on reaching the members of the community (especially the youth) and empowering them through the training.

> ... We thought of the youth- our desire was a way of empowering the youth so that we could unleash the potential of the youth so that they could get knowledge and use it to get employment - which to date majority have taken advantage and have gone ahead to get employment, start their own ICT businesses." (Director)

The emphasis therefore was the youth and later women, as it was felt that these groups needed more support than the adult men. Whereas the original intention was to target the youth, the women and other underserved groups, it soon became clear that the underserved group included men, school teachers, civil servants and business people. Since most of the community were not computer literate, and as awareness on the potential of computing increased (as more people got trained), what began as a trickle became a stream and eventually a river with many enrolling for the training (See Section 4.2.1.8).

4.2.1.5 The Trainers

The first task in the program was to identify and recruit the trainers. The trainers were certified International Computer Driving License (ICDL) holders and had experience in using computers and training. They were also required to have Personal communication and personal relationship skills, to enable them engage with and train members of the community. The training materials were supplied by Microsoft and the training team had to go through them and try and customize them for the rural audience. The training team

at Ugunja was eight in number. All of them were tutors but four of them also had other responsibilities including graphics design, documentation, video editing, maintenance, web design, hardware and networking maintenance and repair, among others. UCRC later established a training centre in Siaya town, to cater for the many civil servants that were expressing interest there. The team at Siaya town centre was four in number and all were involved in training (UCRC, 2007).

Table 4.2: Trainers at Ugunja Centre

	Name	Gender	Responsibilities
1	Jaclyn Ouma	M	Graphics design, Secretarial Work, tutor
2	Phenny Angira	M	Documentation, Video Editing, repair maintenance and networking, tutor
3	George Ouma Ojode	M	Software Coordinator, web design, tutor
4	Cleopa Timon Otieno	M	Hardware Coordinator, repair maintenance and networking, tutor
5	Paul Omondi	M	Tutor
6	Billy Owino	M	Tutor
7	Emma Atieno Olucoch	F	Tutor
8	Samuel Ochieng	M	Tutor

Table 4.3: Trainers at Siaya Town Centre

	Name	Gender	Responsibilities
1	Pheny Angira	F	Business Management, tutor
2	Billy Owino	M	Tutor
3	Paul Omondi	M	Networking
4	Roselyn Ajuma	F	Volunteer, Tutor

4.2.1.6 Mobilization

Before the commencement of the training program, it was necessary to create awareness and mobilize the community to attend the training. To accomplish this, UCRC utilized a numbers of strategies. Having been a CBO and NGO in the community for long, they started with their existing networks and the programs and initiatives they had on the ground, which included more than sixty local community groups. They also had

awareness campaigns in the form of posters, road shows, announcements in schools, churches and community and government meetings.

> "... We had things like posters, we had a truck that was going around the community with loud speakers making the announcements (like a road show) but we also used other gatherings - churches, schools to spread the word that we were offering the training and that any person could come and register." (Projects Officer)

With these initiatives, it was not difficult for UCRC to raise awareness on the training and mobilize the community members that were already being reached. This way they were able to reach a sizable number of people and spread the message. In all these forums however, UCRC had to educate community members on the initiative, explain the potential benefits of going through the training and counter negative psycho-socio perceptions about computer training so that people could enroll for the training. This multifaceted approach helped to get the word out after some time. There were still many skeptics however, and a lot of work had to be done to convince the community since this was a hitherto unfamiliar endeavor and there were no obvious 'tangible' benefits to show the people. Once the training began, word of mouth became the mobilization and people began to come from surrounding towns and villages, with some coming from as far as 15 kilometers away.

> '...There was over-excitement - when someone could come and get trained they would go out and spread the message and the word would go out and the people would get interested and feel they would also want to be part of it and come while for others they would send their children to come for the training' (Director).

> ' … the resource centre at the time was a very known place and it was the best training place in the whole area and people used to come for training from all around the area and I could not miss it since I come from Ugunja. (Office Assistant).

4.2.1.7 Training Duration and Timing

The training was conducted for a period of two months for each cohort. The classes were conducted in two hour sessions daily during week days. Four classes were conducted for four different groups per day - the first between 6.00 - 8.00 am for the teachers and other

people in formal employment. The other sessions ran from 10.00 am. - 12.00 Noon; 2.00 pm. - 4.00 pm and between 4.00 pm - 6.00 pm. Those with flexible work schedules and the youth attended classes during the day, while the working people came for the early morning or late evening session. With this flexibility, those who were interested were able to come for the training.

4.2.1.8 Profile of the Trainees

On the characteristics of the attendees, there was a clear bias on age. There were more youth than the adults. Most of them attended the day sessions. There was a good mix of male and female. Even though the youth were the majority, there were many older folk, both male and female. It was observed that quite a number of the older folk were either civil servants or teachers in both primary and secondary schools.

> We had a registration form that captured people's education. Many of the people were form four leavers. We also had people who were working and had other qualifications but did not have IT training. We even had children in Primary school but the majority of the people were form four leavers since the target really were the youth and women. (Projects Officer)

Much as the majority of the trainees were the youth, this was not exclusive, since we had some people not in formal employment (see Table 4.4). In this group though, the women seem to have had an edge over the men. Some men were reported to have preferred working in their farms or getting some wage-bringing work than going for the training. Some of the men in formal employment were heard to remark that it was the youth and the unemployed who needed to attend the training to increase their employability. All in all however, there was a good mixture of the old and young, the working and the non-working, male and female.

In terms of requirements to enroll, one needed basic literacy – one had to have completed primary education with most having gone through Secondary School. This was because the language of the applications was English and it was also use as the medium of

communication. The illiterate and those with no English language skills could therefore not attend the training.

From the experience of the trainees, there was a clear bias towards the youth. On being asked about the profile of the trainees, one of the graduates of the training program had the following to say:

> ... Most of them were form four leavers. ... Old people were few but they were also there. (Office Assistant)

> ... There are more women than men. (Bureau Trainer)

Microsoft and UCRC engaged an outside consultant to evaluate the outcome of the training project by the end of 2007 and this resulted in a report that summarized the training for the two main training centers: Ugunja and Siaya town (Van Groen, 2007). Below is a summary of the beneficiaries of the training program in 2007, showing their profiles, in terms vocation and gender, taken from the report. To cater for the students, there were training sessions targeting the students that were mounted during the school holidays.

Table 4.4: Trainees at Ugunja and Siaya Centres

Year	**Number of Trainees (by Gender)**			**Number of Trainees (by Groups)**						
Year	Male	Female	Total	Business	Farmers	Teachers	Civil Servants	Students	Others	Total
2004			79							79
2005										
2006			512							512
2007	661	593	1264	66	400	119	63	262	363	1264

4.2.1.9 Training Duration Extension

In the agreement UCRC signed with Microsoft in 2006, the MUP grant was to last 4 years. It was hoped at the time that was sufficient duration to reach most of the community members that needed and requested for training, more so the target group of youth and women. Though in the beginning the interest picked up slowly, the momentum built with time with many being put on the waiting list as the project progressed. This prompted UCRC to begin exploring possibilities of extending the original grant. By the time the four years came to an end, it was clear that there were still many in the community that needed training. By then the interest had really soared and the waiting list was long. Microsoft agreed to extend the grant and signed MUP II grant to last two years. The project was therefore extended for two years and this ensured more and more people in the community were trained.

> The initial phase was 2006 - 2010 and then an extension 0f 2 years, but actively the training started late 2007 to 2010, then an extension of 2 years. (Projects Officer)

Apart from training more members of the community on basic IT skills, phase II of the project sought to give extra skills to the beneficiaries of phase I who were not already in gainful employment. The plan was to give them entrepreneurial skills. Phase II was therefore in part an "incubation process which will enable youths to own and run IT based businesses." (UCRC, 2007). The UCRC report further stated that

> ...There has been a concern of what next after the basic literacy; this new partnership with Microsoft volunteers for micro-entrepreneur will enhance the skills of existing graduates to create jobs and to develop the IT industry in Siaya District. (Ibid)

During phase II therefore, the trainees who possessed basic training were exposed to further training courses including**:**

- Multimedia (Video capturing and editing, digital photography)
- Secretarial Work

- Computer repair, maintenance and user support.
- Business establishment Management

4.2.1.10 Initial Observations on Project Outcomes

Talking to UCRC and some of the beneficiaries of the program, it was the feeling of many that a number of positive outcomes could be attributed to the training. It was clear that the community came to appreciate the use of computers and the potential benefits of the knowledge. Many in the community were happy that they could use the computers for various actions. It is reported that a number of the training graduates went on to get employment from the skills they received.

> …If you go to most institutions in Ugunja and other centres around Ugunja that are offering computer-related services and training, most of the people working in these places were trained at the centre. (Projects Officer)

Most of the informants, apart the management, were graduates of the centre. All were employed or running businesses utilizing the skills and knowledge they had acquired at the centre. Many spoke about many of their friends and colleagues who were working in other towns and while some went on to diploma colleges where they got more training in ICTs, others were utilizing the knowledge they got from the centre in their daily work. All, except one informant were interviewed either in their businesses or their working place and it was observed that they were clearly using the skills they got. This, combined with the information they gave and the fact that their contacts were given by the project manager as beneficiaries of the training confirmed that they were utilizing the ICTs skills they got.

There is even a feeling that the ICT-related businesses around Ugunja were began because there exists a demand for the services they offer – a demand created because people in the community got ICT knowledge and realized the potential in ICTs and the services they offer.

> …the whole idea of starting these services is as a result of the knowledge that is available here because of the training such that people can access internet, create their documents, email, etc, This is largely because of the training. (Projects Officer)

It is further believed that the reasons why other towns far from Ugunja (and Siaya) - whose inhabitants did not get exposed to the training – do not have ICT services is because the people in these other towns lack the awareness and knowledge since they did not go through the training.

> …. If you go to other centres the size of Ugunja that were not exposed to the training [because they were not so near], (e.g. Yala), you find that the number of computer services found here [Ugunja] are clearly unavailable there, at least not to the level found here at Ugunja and most likely it's because of the training and awareness and knowledge. (Projects Officer)

Our observations in the township confirmed to us that there were a number of ICT bureau offering various services to the people. For a small rural township with many poor people, it clearly shows that there were many that had skills in ICTs and who were utilizing the skills to get various services. The question of other towns not having as much activity in using ICTs came up again during the focus groups. Yala in particular was named as one which though similar in size to Ugunja, there was very little ICTs activity.

It is also claimed that the training created opportunities for the youth. Talking to the trainees, it was found out that a number went on to begin their own businesses offering ICT services. One of them, a form four leaver who did not have any other skill apart from the IT training went on to found a bureau where he trains the people on basic IT knowledge and offered other services including typesetting, email services, access to online government services, printing, etc.

> …I deal with computers. I did computer training at the Ugunja Community Resource Centre (UCRC) after completing Fourth Form. … At first I worked for somebody for 2 years (2009 – 2010) who had a training school, where I was a trainer in computer applications. I then got some money and bought 2 computers and then hired this office and started training people in computer applications. I then added other computers, some time towards the end of last year. (Bureau Owner)

Another training graduate went on to start a computer bureau with the training he received. The bureau offered Internet services, email, printing, photocopy, etc, and at one

time was what the media personnel in Siaya used to file their articles/stories to their headquarters in Nairobi.

> …When I went for the [UCRC UP ICT] training] we learnt a lot; also I developed an interest of becoming an entrepreneur – I decided to buy some computers and open a place, for some people also to learn, and also by that time, to get Internet [services] was not easy here, so where I opened, I installed Internet [connection] and people were coming and even these people of Nation [Newspapers] – by that time even the [government] Information centre did not have Internet – so they [news people] used to come there in the morning and file their stories to Nairobi, and they liked it – and people were very willing to learn and I employed people to carry out basic IT skills training, and some computer services were also being offered, and so I developed an interest of being a business man and in computers. (Civil Servant 1)

A number of graduates went on to get employment in computer bureaus, cyber cafés, and other organizations requiring IT assistants, in Ugunja, Siaya, and other towns in Kenya. One of graduates of the training recounted how the basic IT skills she got during the training enabled her get a job at a computer bureau in Ugunja town.

> …I trained at Ugunja Resource centre in 2008. After that I stayed for only three months and then got a job here at Smartcom: I started working here in 2009, March and I've been working here since. … (Bureau Worker 1)

This person utilizes her training to work at the computer bureau and from this earns her living. Apart from the basic services she offers, she says she has been able to train people being employed at the bureau without IT skills.

> We do get people coming here employed by my boss to work when they are completely green and have no computer knowledge but as they have worked here with me and through my support most of them leave here when they have at least knowledge in computer, they can do everything we do here and later when they leave here and go to other places and many later call me to tell me they appreciate my work because I assist them to get employment elsewhere (Bureau Worker 1).

Another graduate got the training and later got a job as a trainer at an ICT bureau in Ugunja town.

> ….I studied computers and then later I was employed as s tutor based on the advanced level. So I can train people on the basic computer packages. …I began early last year and I have therefore worked for more than the

> year. … I have trained many people [at the cyber café, typing, designing, doing everything] and then there are people who I trained and they are working in Nairobi … (Bureau Trainer)

Another, training graduate completed the training and later got employed as an IT assistant in a Law firm near Ugunja town. After going through the basic ICT skills training at UCRC, he developed interest and went to Nairobi for further IT training, before coming back to work at Ugunja.

> ...I work here in this law firm and I do most of the computer-related work, like printing, typesetting, designing with basic software applications, basic maintenance and sometimes some office work. … I came here in June this year – before that I used to work in Ugunja town in a cyber café (Office Assistant)

Many other graduates went on to get computer-related work in and out of Ugunja town.

The UCRC management also claimed that the training project had a big impact.

> …It has had an impact - a huge impact even though not well documented. (Projects Officer)

We sought to get some indication of this impact from the beneficiaries interviewed. Many spoke about the way that the skills have given them a livelihood, which had enabled them to improve their lives, and the lives of other. Some had build houses with the proceeds from the business they started; other had educated their siblings, while others had assisted relatives and needy people to get IT training. Still others claimed that the skill they got had raised their social status, made them 'modern' and others said that it had 'made them what they are today.' We review some of the comments on the effect of the training that the graduates made in the interviews below.

One of the beneficiaries of the training, who went on to utilize the knowledge received to start an IT services and training bureau using the savings from his employment – which itself was enabled by the training – claimed that the proceeds from the business had enabled him to get a livelihood which also enables him to pay school fees for his brother. He says that the training 'opened his way,' 'made him what he is today. He also used the proceeds from the ICT business to build himself a house, thereby also brining him respect/pride in the community, and with the savings from the business plans to begin another business.

> So through the training it [..] it has therefore made me what I am today [..] it is not me alone – there are friends and family, who are benefiting from the knowhow. I have a brother in high school that I'm helping with fees. ...I've also used the proceeds from the business to build myself a house. According to the culture of my community, the first house a man builds (called "Simba[4]" in the Luo language), has important cultural implications. (Bureau Owner)

From the ongoing, it is clear that the training this graduate received has had a positive effect in his life. Another graduate, says that the training has helped to improve his life and raise his standard. He expounds this by sharing some of the positive outcomes/valued functionings that the training has enabled in his life and reports how he uses the knowledge and skills to help people in the community.

> …Yes, it has helped me to progress in life – I am at a better /higher station in life. …It has helped me – now I have my own house, I can pay primary exam fee for my sisters and brothers, I can assist my mother with household purchases and at times I assist my dad when he has some financial need. …Apart from training [people], I have helped people in the community. There are times when there are seminars in the community that require the participants to have some computer literacy and I have come in and assisted them so that they have some basic knowledge." (Bureau trainer)

Another graduate, lauds the knowledge for enabling him access Internet, online government services, upload work electronically to head quarters, and assist workmates get services online. He says:

> … Now it can help me access Internet, access government services, now that most government services are being accessed online, sometime there are some reports that we prepare and then send to Nairobi [ministry of finance headquarters] through the Internet, also our pay slips, nowadays you can't get your pay slip unless you go online; if you want you go and download, so I find the knowledge helps, like here many people [colleagues] come and I show them and a number can now also access their pay slips through Internet." (Civil Servant 1)

[4] Simba: among the Luo community, the first house a man builds has important cultural implications as a man ritually moves from his father's house to his own home. The 'moving' is accompanied by cultural rites leading to the community acknowledging the person has a home

In summary, some of the benefits the graduates of the training programme received included the following:

- Further training in colleges in Kisumu, eldoret and Nairobi for professional certifications and diplomas;
- Getting employment in Ugunja Township;
- Getting employment in the larger towns like Siaya and Kisumu;
- Working in the civil service.
- Starting ICT-related businesses like cyber cafés and training bureaus
- Pursuing ICT Programs at various universities due the interest and knowledge received during the program.

One interesting feature at the community level is the change in the ICT-related businesses in Ugunja and Siaya towns. In Ugunja for instance, it is reported that at the onset of the training there were only two ICT-related businesses. After the training, it is reported that this number rose to fourteen. Whereas there may well be many reasons for this increase, it is clear the demand for ICT-related services rose up significantly and some people – among them the trainees and UCRC personnel – believe that the knowledge and interest generated by the training significantly increased the number of ICT-literate people and hence the demand for ICT services. They thus believe the high demand for services mean that people are utilizing their new skills for their every lives and livelihoods. Many of the businesses are still operational.

> Two years after the project, the youths trained at the centre had come up with ICT-related businesses offering ICT services, products, and training. The ICT-related businesses grew from 2 when the training project began to 14, two years later (Project Officer).

At the end of the training, some of the graduates used their newly-acquired skills to make a movie, whose script was based on an infamous local character that lived the community. The movie – 'Maro Oketho Ugunja[5]' – is based on a true story in the community, of an elderly woman who went on a drinking spree and in her drunkenness met her son-in-law – also drunk – and they had a sexual liaison, which is a taboo in the community. The movie had a humor element in it and was done with a view to spread a

[5] Luo for Mother-in-law

moral message. The fact that the movie was based on a true story on people in the community, and fact that it was not a positive incident can indeed raise ethical issues or introduce shame to the persons. The feeling communicated from two of the informants was that the incident was against the norms of the community and it was a great shame for the community. It was felt that the movie would be made to enable community learning and spread the outrage among members of the community through the movie so that the behavior will be discouraged. The community is clearly very proud of the achievement of their youth in making the movie which was watched by a large section of the community. The fact that members of the community were proud and not put off or shun the movie showed that the idea of the movie had the blessing of people in the community who wanted to spread the moral message about inappropriate behavior after drinking. The 'feat' stirred up a lot of interest in local movie making which remains to date.

4.2.1.11 Training Wrap up

The curtain came down on the training when the MUP II grant came to an end but the people still remember the free training with nostalgia and gratitude and some still demand that it is carried out again. Some of the alumni of the training we talked to not only recall the training with nostalgia but openly expressed how the training enabled them to become what they are today as they have used the skills to get enable them get jobs and start businesses.

4.2.2 Sega Silicon Valley (SSV)

4.2.2.1 The Genesis

SSV is the brainchild of Mr. James Ofwona. Born and raised in Sega, Mr. Ofwona later immigrated to Poland where he presently lives. He is a businessman and has businesses in different parts of the world. His motivation came from his mother who when he was growing up admonished him never to forget where he came from. He desired to see the community - especially the youth and women - exposed to and empowered to use new technology in order to bring them to the same level with the rest of the world and be able to better their lives

> ... he says - his mother told him never to forget his home area; " wherever you go never forget your home area" [..]...he wanted to bring the community at the same level with[in] the digital world, because the community was backward. ... there was no ICT centre around, there was no access to ICTs. So he wanted to make the youth and women be at par (at the same level) with the whole world digitally; where every youth here can compete with any other youth elsewhere [..]...the main target was youth and women. It was realized that those were the disadvantaged groups (SSV Manager)

It would therefore be safe to take it that the founder believed ICTs have the potential to empower the community to improve their well-being. It is therefore not surprising that though the project has many different interventions (e.g. in agriculture, security, rehabilitation and equipping of schools, etc.) there seems to be an emphasis on ICTs. The Name [Sega Silicon Valley] - clearly borrowing from the Silicon Valley in California where the modern IT revolution began - seems to mirror the strong belief that ICTs can have an impact in society.

The vehicle used by the founder was Simba foundation - a foundation made up of business friends in Poland and Kenya. The foundation, in line with the founder's vision had as its vision to contribute to the community in Sega. After fundraising both in Kenya and Poland, the foundation then engaged the community and sold them the idea. It was embraced and the vision became a reality. One of the community groups donated land to the foundation on a 10-year renewable lease and the foundation was able to establish the Sega Silicon Valley, renovate the existing building and convert it to offices and meeting/training centre.

> '...So they fundraised, came back here and talked with the community. the community also embraced the idea, and they (the community) gave this land [on which the Sega Silicon Valley offices are built] (SSV Manager)

Much as there is an emphasis on ICT interventions, they are not the only ones; many others have been implemented. These interventions include education, security, agriculture and infrastructure. In education the foundation partnered with another organization called Imani foundation, which provided a bursary fund for needy but bright students. The project also renovated needy local primary schools, and provided some needed infrastructure. An example is Kogere Primary school which was given a face-lift in terms of renovation, solar-powered electrical power, computer lab

> it [Kogere primary school] is in the village but it is like it's in town - there is Solar System and all that (SSV Manager)

The computer lab provided by the foundation dubbed up as the community ICT training centre in the evenings and the weekend. To get entry into the community, Simba foundation engaged the community and established the issues of concern, one of which was insecurity. They therefore talked with the local government administration and got commitment to establish a police post in the area, whose construction they funded. They also renovated other police stations in the area and provided computers to be used in their operations. SSV went on to provide agricultural services including tractor ploughing for a small fee, provision of agricultural information and best practices.

> ... The another one was about security ...there is also a police post that was initiated by SSV, just down here and renovating the police station. So security was another area of intervention. Then another one was agriculture. (SSV Manager)

4.2.2.2 Vision of SSV

Much as there is a lot of emphasis on the use of ICT intervention to impact the community, the vision is much broader. Upon identifying lack of electricity as a major bottleneck for other projects in the community, the foundation has a vision to get involved in power distribution through funding rural electrification. Other projects, according to the SSV manager include street lighting at Sega township. On the security of the community, SSV has so far facilitated the refurbishment of a police station and the building of a police post at Sega. There are plans to refurbish other police stations and construct others, while also providing them with computers for their operations. They also plan to set up a digital village for the whole community. This village is to be a wireless network for the whole community that is to be connected with the server at SSV. SSV is working to set up a Business Process Outsourcing Centre that will get work from the United States, with a view to employing the local youth.

4.2.2.3 Mobilization

On awareness creation and mobilization, SSV used an effective approach to gain entry into the community. They engaged with and worked with the community in the beginning

and after identifying the community needs sought to meet those needs. The renovation of schools, rehabilitation and construction of police posts, and the provision of ploughing services at a very low cost got the community's attention and they were willing to listen and give the ICT intervention a chance. Thereafter, the SSV continued to engage with the community and utilizing community meetings and gatherings, they were able to sell the potential of the ICT project and get commitment on the same, because of the trust already established.

> ... the first projects (like the school innovation) made them very anxious [excited] and they got very interested and began to ask themselves - who are these people that have renovated the school? Then came the police post that I talked about earlier - people got interested and began to ask, 'Who are these people that are bringing all these developments?' So it's like the school has been renovated, the police post has been built in a very insecure area, then also for agriculture there was a tractor bought by SSV proving ploughing services for the people at a very low cost. So people got very interested and then after that it started with the leaders. The leaders were spreading all this around, 'Let us come together - these guys have something good.' This message was kept us in the Barazas[6] and other community forums, and within a short time the community got interested such that whenever a meeting was called, people could come.' (SSV Manager)

As the training began, it easily got traction since the youth perceived and received it positively. To date there is a great demand for the training and the centre can hardly cope especially during the December holidays when there are fresh form four leavers.

4.2.2.4 Resources provided by SSV

SSV has so far donated 120 computers to 6 institutions (2 primary schools, 2 secondary schools, 1 Youth Polytechnic, 1 Community Learning Centre). They have also created Community learning centres both at the SSV offices and at Kogere Primary school. The vision of SSV is to connect different schools by creating a network using fibre optic cables. They also plan to introduce computer learning lessons in schools and ensure all students get computer literate. They also aspire to provide Internet access for all schools

[6] Barazas are community public meetings convened by the local administration to discuss and address community concerns and disseminate information

in and around Sega village. Another project they are pursuing is to create websites for each school, that will managed by the school' representatives.

4.2.2.5 Services Offered at SSV

Since the beginning of SSV, many in the community have gone through basic IT training. Whereas it is the youth - more so the form four levers - that have benefitted from the training, the training is open to everybody in the community. The beneficiaries have been mixed, from small children to youth to mature adults.

> '...generally, we don't really require a qualification to join. If you need basic IT knowledge, you can read and write, you are allowed.... for basic IT training, even class two! Because in that school I was talking about earlier - Kogere Primary School - all of them learn/take computers and you will be surprised when a Standard two pupil knows something - whether he can read or not but he knows how to maneuver and all the - store a game somewhere and he will maneuver and reach there, then afterwards he gets to know this is the folder, this is the name of this and reads and all that - so for entry qualification requirements, we have none for the basic training. (SSV Manager)

This open admission has enabled very many people from the community to benefit from the training. One of the trainees extensively uses ICTs to communicate with his clients and suppliers, to get product information, make orders, and do budgeting and reports had the following to say.

> ... If we talk about education, me I am not that educated - I completed class 7 in 1982, but I could not manage to proceed with education because of the family background [lack of fees], so I just moved to *jua kali*[7] (Informant 3)

Even though the man had little education, he went through the training and today uses the Internet and email for communication and information search and for managing his electrical suppliers and fitting business.

Still on the training, the graduates of the basic ICT training who are interested are taken through the Cisco academy course where they learn IT essentials and basic networking. For one to go through this course however, they need to have successfully completed the

[7] Jua Kali is a Kenyan colloquial term for the informal sector

basic ICT course and be a form four leaver. This is because the course is demanding and requires basic level IT proficiency and some education.

> ... where we require some higher level of IT knowledge is Cisco training because it's a bit challenging (the IT itself) so we require mostly form fours and we need some IT knowledge ... you should be computer literate up to a certain level like diploma - you don't just come when you are green. (SSV Manager)

> … it is here that I got trained in basic computer skills and I got the 'CISCO IT essentials training', so I am training for them as I wait to register for CCNA certification training (informant 2)

SSV also rolled out the Community Connectedness Project, sponsored by Cisco where volunteers are trained to work with the community, identifying the information needs of the community based on the livelihoods and the everyday activities. These volunteers then research on the Internet for content that provides the information required by the community, package it and provide it in a relevant and timely way. Another vision of SSV is the establishment of a Business Process Outsourcing (BPO) centre where hope to get outsourced jobs from an organization the United States [Sommersource] and get the local youth to get employed there. The manager explained that this was a pressing need because much as the main livelihood is agriculture, there are no cash crops and hence most people are subsistence farmers. This leaves many youth without employment or livelihood. The BPO initiative was however yet to pick up.

4.2.2.6 Reported Initial Outcomes and Impact

A number of outcomes have been reported out of the project. One centre has been Kogere Primary School and Community Knowledge Centre. At the school, all the teachers have been trained in basic ICT skills. It is reported that the teachers are utilizing the new skills to for communication, information access and search and social networking. For their immediate work they use spreadsheets for producing consolidated mark-sheets for the examination marks for their classes. SSV manager says that there has been a great impact on the teachers. The foundation facilitated a link with a primary school in Poland and every so often, Kogere Primary School children hold discussions and debates with counterparts in Poland through teleconferencing. The children have also been using social media for networking and socializing with their friends.

On the outcomes of the project at individual level, there is consensus both among the trainees and SSV that the project has had a major impact on the community. The SSV Manager says that there has been a great impact because many have gone out and used the skills they got at SSV to get employment.

> ...generally, the impact has been great - it has been positive mostly, because there's quite a number of people that I can say right now got a job after getting the training from this place. (SSV Manager)

There are those who have been trained and utilized the training for starting and conducting their business. Others have been business people who are using ICT like simple spreadsheets to manage various aspects of their business.

> ...there is also another group called Cooper women group, after getting the agricultural knowledge and some training in agriculture, they are now able to do their own business, making their products and selling. ... there are some business men who passed around and got basic training on Spreadsheets (MS Excel), they bought computers and now they are managing their business using computers. (SSV Manager)

On the spread of the impact among the beneficiaries, it is apparent that youth have been the largest beneficiaries, just like the intention of the founders was. Much as the beneficiaries of the project have included both the youth and the old people, the SSV manager says that the youth have used the knowledge acquired at the centre to better their lives more than the old people.

> ... I'd say that the youth are really benefiting a lot and using the knowledge to better their lives more than the old, ...most of the youth pursue other courses and is helpful to them, some get jobs like in cyber cafe's and interrelated jobs, so I see the youth benefiting a lot and using the knowledge more than the old. (SSV Manager)

> As per now I'm working with an NGO which is associated with SSV called Goal4. It is housed here at SSV. I am using what I learned here at SSV to do my work at Goal4. What I am doing there is based on Internet and without learning the Internet here I would not be able to do what I do at Goal4 and so the knowledge has helped me a lot (Informant 6).

On the outcome of the ICT project at SSV, the various people who have benefited had different experiences but most seem to agree that it had a positive effect in their lives. Informant 1, a young man that is presently an Industrial Chemistry student at Maseno University had a number of benefits to report. He reports that the training was really

assisting him in his learning at the University. He claims that from the lecturers posting learning material, the students submitting assignments, communicating with colleagues, getting supplementary learning materials on the Internet, it has really assisted his learning. The same student utilizes the ICT knowledge and skills to earn some money for his upkeep at the university by providing services to the other students using his laptop.

One of the outcomes of the ICT training that has consistently been mentioned by a number of the informants who are graduates of the training project is enhanced communication. Many have mentioned how their knowledge of ICT has opened up a new way of communication through email and social networking, which hitherto was not available to them since they did not have the knowledge or the skills. They have utilized this new-found ability for their livelihoods and their every-day activities which have enabled them to work faster, more efficiently and conveniently. One of the trainees, an electrical fitter-cum-contractor expressed his joy at being able to get product information and to communicate with clients via ICTs. He had the following to say concerning how his working has changed since getting the skills:

> ...The computer enables me to do my work easily. I am able to collect information from the Internet for those items that I am dealing with, for instance if I want to get the manufacturer of the item, or other details on the items. Before it used to be very hard to get details on the items but now it is very easy using the Internet. ...secondly I get it very easy for communication. I have some clients in Sudan, some in Rwanda, some in Mombasa, some in Nairobi. ...we are communicating as if we are sitting at the same table, using the Internet. (Informant 3)

Further, he says that ICTs has made his work easier and convenient, enabling him work faster, do many activities without moving from the same place. He says:

> ...for example, when I want to make a quotation, I don't go here and there; before I used to run far looking for a computer person to type my quotation. This time I have my laptop, I just sit at table and type in my quotation, those that are supposed to be sent by Internet I just send, those that are supposed to be printed, I just print it and present the quotation, it makes my work very easy; I can now do a lot of things within a short time, (Informant 3)

He also claims that as the people around him have watched him use the ICT knowledge in his work, it has made them desire the same skills and influenced their decision to go for the training. This is what he says:

> ... and what I am doing has influenced many people to join the IT. Many people are now learning because the way they see the ones accessing the Internet doing their jobs, it is motivating them to join. I can see people trying to follow that channel. (Informant 3)

On talking to the management and different people that graduated from SSV, one gets the idea of a community that has been 'invaded' by ICT but who have willingly embraced it. The beneficiaries talk about the training and ICTs positively and talk about the benefits of being knowledgeable in the same and the effect this has had in their lives. Among the outcomes and benefits of the training has been

- enhanced communication;
- information access;
- utilization of ICT for livelihoods (e.g. business or work);
- use of ICTs to facilitate learning;
- employment in ICT-related businesses like bureaus and cyber cafe`;
- employment as ICT assistants in various organizations;
- starting businesses offering ICT-related services, and
- pursuit of further ICT training at diploma level.

4.3 Reflection on Methodology

It proved difficult to get the informants re-live and recount the actual process they went through in the conversion process. It is clear that they were unable to recollect some of the decisions and cognitive processes they had gone though. It could also be that they were not conscious when or how they made those decisions and what influenced them. We could infer the factors and resources that influenced the conversion but the people could not describe or even be conscious how the decisions were made. An attempt was made in Case 1 to try and pry during the interviews but it often drew a blank. That was one reason a decision was made to have a focus group so that conversion process could be discussed further. We resorted to asking indirect questions and more open questions and allowing the informants re-live the scenarios by telling stories. During analysis of the transcriptions, an attempt was made to trace the process through the concepts that

emerged and later through relationship displays. To map the actual decision-making process, it seems there is need for extended ethnography that will allow the researcher live for long periods immersed in the community, taking part in their livelihoods and use of technology so that they can perceive the things they have reason to value. This may help in unpacking the conversion process to greater detail.

5. CASE ANALYSIS AND DISCUSSION

5.1 Introduction

The chapter deals with the analysis of the two cases. This involved identifying concepts and relationship between concepts, themes and how they are related to the concepts and with other themes. The emerging themes are then compared and contrasted for the two cases, discussed in the light of existing theory on conversion and a carefully written account of the cases is pieced together. For the analysis and discussion, we used the adopted ICTs definition (See section 2.2.3). We considered that they are 'a combination of electronic information processing systems and communication technology, people (in their various roles and relationships), techniques, support resources and information structures, and that the design and final form is determined by the social context, which in turn affects the ability of the user to use it, and the impact they will have.' In light of that definition, ICT basic skills training has to do with *people, techniques, support resources and information structures*. The *ability of the user to use them and the impact they will have is determined by the social context*. We therefore proceeded to explore the action of the social players in light of the social context.

5.2 How ICTs and other Resources Affect each other and how this Influences Conversion to Capabilities

5.2.1 Characteristics of ICTs

For each of these categories, analysis of the data was investigated with a view to getting the influence and the way the conversion process plays out. For the first case, UCRC (and their supporters – Microsoft) clearly perceived that ICT knowledge and skills could benefit the people of the community. Similarly for the second case (SSV) it was the

perception of the Simba foundation that exposure to ICTs and basic ICT knowledge had the potential to benefit members of the community.

It is apparent that most people in the two communities knew little, if anything, about ICTs, let alone being aware that ICT skills could benefit their wellbeing. In Sections 4.2.1.6 and 4.2.2.3, we saw that awareness on ICTs and their potential had to be carried out. Awareness was therefore a prerequisite to enrollment. For the UCRC case, the training was almost free throughout the entire project, while for SSV the training was very cheap in the beginning but the fee was increased later.

As discussed in Sections 4.2.1.3 and 4.2.1.4, the ICTs in our study are the training in basic ICT skills that was offered to the community. The training involved introduction to computers, introduction to the Internet, basic word processing and basic spreadsheets. Other aspects involved power point presentation and basic database concepts. The applications were all from the Microsoft Office suite. Because most people were new to computers, the training involved very basic skills from keyboarding to introduction to the various applications, starting from scratch and slowly building the basic skills. From the adopted definition of ICTs (Section 2.2.3), the people get information on ICTs and techniques on how to use them. This information and techniques can be viewed as ICTs education. This education will enable them to choose the particular ICTs to use and how they will be configured in their particular social context in order to achieve a functioning they have reason to value.

5.2.2 Effect of Resources on ICTs

We begin by looking at code 'Effect of Resources on ICTs.' Under this code we explore the different issues that arose during the interviews. From the findings, it is apparent the resources could either enable or constrain one from accessing or enrolling for the ICT training. Some of the resources that emerge are considered and discussed below. We will consider the experience at UCRC, then go through the findings at SSV and compare the two.

Education Resources

UCRC

Listening to the trainees describe their experiences, it emerged that education was clearly one of the issues that could affect a person's access to the training. The training was not only conducted in English but the various applications being taught were all in English. This meant that the trainee had to be literate and be able to read and write English to a certain level of proficiency.

> Most of them [trainees] were form four leavers. Most people were educated. One has to have been educated since the training was in English.' (Office Assistant)

It is clear that without basic education (preferably secondary level) it was difficult to go through the training. Those that went through the training could later use the ICTs, while people without the training could not use them. Ability to use the ICTs gave one access to the potential functioning that they could enable. People without basic education could not get trained and hence could not use the ICTs. This disqualifies them from accessing the potential functioning. If the particular potential functioning is part of what the people are deprived of then they will not be able to use ICTs to achieve the functioning, which would disadvantages the uneducated members of the community.

SSV

At SSV, one of the reasons given why some people in the area have not enrolled for the ICT training was low education.

> There are some people who have not gone to school or they did not manage to complete form four and they feel since they dropped out of school and reached class eight they cannot come and learn computers and they feel since they have low education they can't learn computers …(Informant 5)

Upon inquiring whether there was a minimum educational requirement to enroll for the ICT training, it emerged there was none.

> Generally, we don't really require a qualification to join. If you need basic IT knowledge, you can read and write, you are allowed. ... for basic IT training, even class two (SSV Manager).

It emerges however that one had to be literate. Upon further inquiry it emerged that most of the trainees had at the very least primary school education; with many being those that had form four level of education.

> For you to be able to understand , you need to have primary school knowledge, but there is also a community computer place at Kogere ... where they offer this training even for these old mamas who never went to school, [..] that one is also going on but, at this point I can say that for you to be able to get it very well, most people I see here [for the ICT training] are either Primary School kids, those who have completed class eight or those who have completed form four (Informant 1)

It clearly emerges that much as there was no educational requirement needed for enrolling for the training, without basic education one would find it difficult to follow the training. This goes on to confirm that basic education was a prerequisite for ICT training.

From the ongoing, it is clear that education resource can have a constraining effect on access to ICTs training for some people. This implies that the converse may be true - that education could be a factor that positively influences the enrolment to ICT training for some people. Whereas education can constrain or enable access to ICT training and knowledge, this relationship can be reciprocal. The ICT can affect the Educational Resource, which in our case is the training and knowledge. When people went through the ICT training, they increased/improved their Education since the knowledge and skill is educational. In this way, education was increased for them. It is this resource that some have utilized to get employed in ICT establishments, while others set up their businesses. We can thus say that ICTs can have an effect on resources which are the means to expand the capabilities.

Financial Resources

UCRC

Another resource that can affect the ICTs negatively is Financial Resources. Much as the training was virtually free, some of the graduates from the training, after working for some time realized they need to get advanced ICTs training to improve their lives. One in particular after realizing the potential in ICTs to improve his wellbeing desired to pursue the same in college but was unable because of lack of finances.

> ...there are so many things I'd like to do with computers. …The problem is finances. …What I need is just to go to college. … What I really need is a sponsorship; I don't need cash, I just need fees or sponsorship, then I can

> go and learn more about computers, then I can start my life again. (Bureau owner)

Clearly this constrains him from going for further training in ICTs. The advance knowledge in ICTs would be the means bureau owner needs to achieve what he desires to be in life. In this case, financial resources constrain him from accessing ICT knowledge which he would then convert to capabilities.

SSV

The experiences of the people at SSV enable us to explore the effect of financial resources on ICTS since the training was not free (except at the onset of the project). A number of informants brought out the fact that to access the ICTs training, there was a fee and some claimed that some people in the community were unable to access the training due to lack of finances.

> ... So you pay something a little, may be for their maintenance. But you need to register with 200 Shillings, and after registration you pay 500 Shillings for each and every package. So you pay a total of 3,700 Shillings, and you get the knowledge fully for the 7 packages - that is the first part of it (Informant 1);
>
> We had to pay the admission fee. We also had to pay K. Sh. 500 per package. To commence I therefore had to pay K. Sh. 200 for admission and K. Sh. 500 for the first package, and then a book and a pen [..] so long as one had the admission fee of K. Sh. 200 and you made a pledge to pay and convinced them you will pay, they would allow you to enroll then you would pay as you proceeded with the training. (Informant 6);
>
> I then told him [the SSV manager] that I could not afford the training since the training fee was K.Sh. 500, per package [..] he then told me that all I needed to start was the registration fee of K. Sh. 200 and the rest I would pay later with time as the money got available (Informant 2);
>
> Sometimes it may be lack of money [that hinders people from enrolling for the training] because one needs to pay the computer training fee (Informant 5);
>
> You need to pay otherwise if it was free, the place would have been full and now they would not be giving adequate services [..] so the community around is happy with ICTs and; and you could see that when they were starting this project -at first it was free - each and every person was

> coming in and it was like they took a lot of time when it was just free. (Informant 1).

We observe that the training fee was out of reach for some in the community. This meant there were people who did not enroll because they lacked the training fee. Even for those who could afford, some had to be allowed a flexible payment plan. Further, we learn that when the training was free in the beginning, many more people that attended. This clearly confirms the fact that financial resources had an effect on the ICTs training, on the one hand enabling the training (for those who could afford the fee), and on the other hand constraining and hindering the training (for those who could not afford the fee). This is especially important for a rural area like Sega which has poor people. If indeed the ICT knowledge can be converted to valued capabilities resulting in people getting out of poverty, those too poor to pay for the training will be disadvantaged. They will not get the knowledge and hence the potential to get them out of poverty, even though the means to get out of poverty are within reach.

Social Resources

UCRC

We next address the effect of social resources on ICTs. For this we explore how various people got to know about and enroll for the training.

> I had a step sister who was learning there [UCRC] and when I completed my secondary school, she told me about it and gave me directions and I went and enrolled (Bureau trainer)

> I'd get to the cyber and see how some of my friends could type so fast into the computer, [..] I got interested and thought I'd love to do what they did if I could get training on computers, and when I completed my secondary school [..] I got back home I shared with my friend Emma who was a teacher at the resource centre [UCRC], and when I shared my interest in getting trained, she told me that that there was a class going on and when the class got completed she would inform me so that I could join the class. I gave her my number and after one month I joined the class (Bureau worker 1)

It is clear that exposure to ICTs, information on the training at UCRC, the joining and training took place though friends. Other people learned about the training through the awareness carried out.

> We had things like posters, we had a truck that was going around the community with loud speakers making the announcements (like a road show) but we also used other gatherings - churches, schools to spread the word that we were offering the training and that any person could come and register (Projects Officer).

Even for people that learned about the training through the awareness campaigns, it is clear that social resources were important. Churches, schools and community organizations that were used for information dissemination are social entities – they really are networks where people meet for social reasons, not to mention that they become members through friends and family. It is also clear that when the campaigns were rolled out and members of the community go to know, the news spread through word-of-mouth.

It was thus through social resources that a number of people learned about the training, after which they enrolled and completed the training. It is therefore clear that social resources will have an effect on ICTs uptake and use.

SSV

At SSV we explore the experience of some of the trainees and learn how their social resources influenced their decision to enroll for the training. On being asked how he knew about the ICT training, one of them explains how he learned about it from his cousin. Another one explains how she began coming to SSV and her experience there.

> At that time when I came to Sega, I was staying with my cousin. Since she had some computers, she asked me to go for the training so that I could learn and then help her work. It was therefore her who asked me to go for the training (Informant 6)

> I have many friends that had already gone through the training before me, and while I was still in school I used to come [with them] to SSV and go through the Internet and use it for browsing, chatting with friends, even though I was not at the time being trained ... I used to be inquisitive, asking my friends [that were enrolled in the training] what they were learning. (Informant 4)

It was the cousin of informant 6 that recognized the opportunity of him helping her with her computer work and asked him to go for the training. He thus got to know about the ICT basic training through her, got financial support and attended the training. After the

training he worked in her Cyber cafe and later moved on to the health CBO he presently works at. The framework identifies social resources as part of the means to the realization of functioning opportunities (in the context of, and facilitated by, the socio-environmental factors). DFID (1999, Section 3.3.2), defines social capital as 'the social resources upon which people draw in pursuit of their livelihood objectives.' They go on to add that they can be developed through networks and connectedness, membership of more formalized groups, and relationships of trust, reciprocity and exchanges. They then point out that 'trust is likely to develop between people who are connected through kinship relations or otherwise.' The Choice framework (Kleine 2009) adopts Bourdieu's[8] definition of social resources:

> 'the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group – which provides each of its members with the backing of the collectivity-owned capital, a "credential" which entitles them to credit, in the various senses of the word."

Kliene (ibid, pp 111) add that 'Membership of these groups can be defined by kinship, friendship, shared ethnicity or class, friendship or informal commonality ties.

It is clear that social resources have to do with membership in a group from where they have access to networks of relationships. Apart from, formal groups, kinship and friendship are also recognized as giving people access to social resources. It thus gets clear that Informant 6's relationship to his cousin gave him access to social resources. Similarly for Informant 4, relating closely to friends who were enrolled at the training, inquiring about the training and visiting the training venue with them gave her access to social resources. It is through these social resources that and going there with them and had friendship to Informant 4 could claim to access social resources that they got to know about the training and later on enroll. Informant 6's experience is even more compelling since it is the course that provided the financial resources for training fees.

Information Resources

[8] See Kleine (2009, pp 111)

UCRC

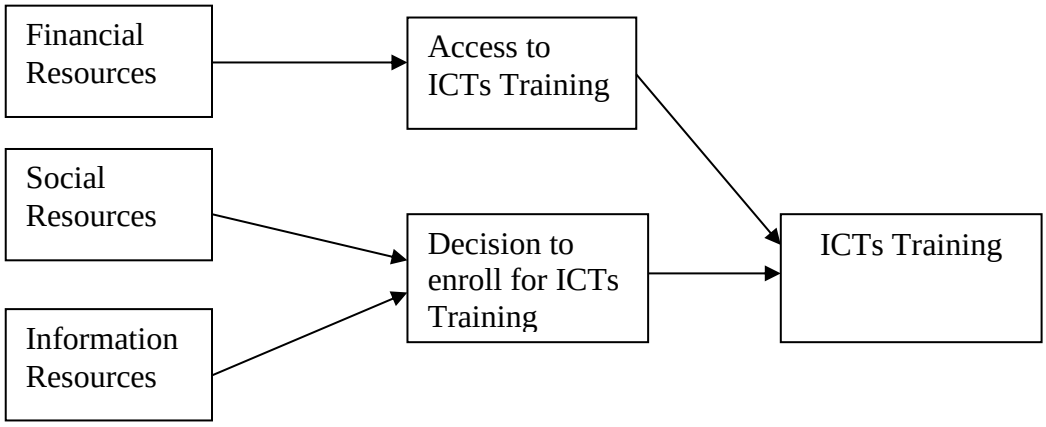
We have already seen that the management of UCRC had to carry out awareness of the availability and benefits of the training in the community (Section 4.2.1.6). This was done through public meetings (barazas), their various projects, and their networks. This informed the community on the value of the training. They also learned that it was free. The awareness that spread among the members of the community can be viewed as information resources. This played a role in giving a chance to someone to consider whether to enroll for the training. The information resources therefore affected (enabled) the uptake of ICTs in the community. This is yet another example of resources affecting the ICTs.

SSV

We saw in Section 4.2.2.3 how SSV carried out mobilization for the training. Mobilization and awareness was important since not many people in rural areas like Sega knew about ICTs, let alone their benefits. We observed that they got access to the community through providing services they needed for free or at a low fee (see Section 4.2.2.3). Once they had their attention, they began to spread the message about the ICT training and the benefits in the different meetings and gatherings and this got traction since trust had been established. Many people thereafter began to come for the training, especially the youth. This awareness about the ICTs and the benefits is an example of information resources affecting ICTs.

As we consider the different resources considered so far (financial, social and information) in the two cases, it is clear that the resources had an effect on the uptake of ICTs training. It is however evident that the resources affected the enrollment/uptake of ICTs training differently. For financial resources, they enabled one access the training by paying for enrollment. The effect of Social resources is such that they gave one access to information about the training and the benefits, placing them in position to make the decision on enrolment. Information resources on the other hand are what one required to actually make the decision whether to go for the training. To summarize, financial resources affected access to the ICTs training, while Social and information resources affected the decision to take up/enroll for the ICTs training

Sen explains that goods and services (resources) are only important in the light that their characteristics enable people to do and to be (i.e. in the light of the capabilities that one can generate from these goods and services (Robeyns, 2005). The conversion factors affect the generation of capabilities from resources. Access (to ICTs) is an environmental conversion factor. If a resource like finances constrains access to the training in ICTs, then people cannot acquire knowledge to utilize ICTs. If they do not have the knowledge to utilize ICTS, then they will not be able to use them to do what they value. This means they will not realize the functioning they value. Conversely, for those who are able to enroll for and go through the training, they get the ICTs knowledge which gives them the potential to utilize it for achieving certain valuable functionings. This is a case of resources affecting the environmental factor which in turn affects the conversion of ICTs to a valued functioning. Similarly, when the social and information resources affect the decision to enroll for the training, they affect one's access to the training which influences whether a person gets ICTs knowledge. This is illustrated with Figure 5.1



5.1: Effect of Resources on ICTs Training (Source: Research)

As we consider the ongoing, it is evident that on going through the ICTs training one increases the educational resources since the ICT knowledge can be viewed as educational resources. Indeed we have observed that two of the trainees (Bureau owner and Bureau trainer) after the training went on to become trainers in ICTs. Others went on to utilize the knowledge they got to get ICT jobs (e.g. Bureau worker 1), or start their own ICT businesses (e.g. Bureau owner and Civil Servant 1). This demonstrates that they

got ICT education, which enables them to achieve a functioning they had reason to value (employment or business). With the employment (work) or the business, they got increased finances (resource) with which (means) they were able to achieve further functioings (Bureau owner and Bureau worker 1 went on to build houses (functioning of being able to get shelter), and both helped their family members).

Another trainee explains how after training they are able to communicate to friends through mail and social networks. They also explain how they have been able to connect with people and make friends from Europe and America through social networks.

> .. it helps me in socializing, cause I have a lot of friends in Facebook, I have some in Twitter, Linked List, Google and also in Skype. So it helps to communicate with people (Informant 6)

> … through Facebook I'm able to chat with someone who is out of the country, like now I have friends in the US, in Germany and I get to know how life is like there and this has given me the opportunity to connect with people from different areas (Informant 4)

It is evident from the above that training enable them to be able to communicate with friends (a functioning they had reason to value). This achieved functioning (of communication) can enable them to increase their resources. Through the increased communication, they can keep in touch with friends and even make more friends, increasing their social resources. We now present our findings so far in Figure 5.2.

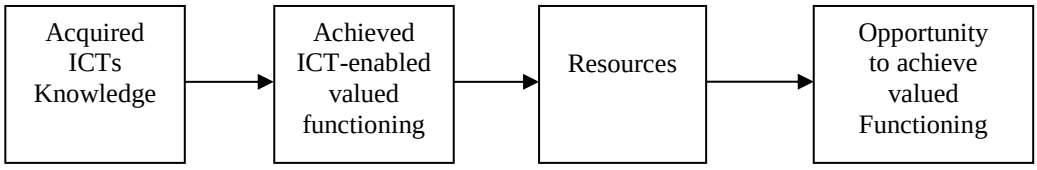


Figure 5.2: Effect of acquired ICTs Knowledge (Source: Research)

We have seen how resources affect the acquisition of ICTs knowledge – either enabling or constraining it. We have also seen examples where the capabilities realized from the utilization of the acquired ICTs knowledge can affect the resources. It is therefore apparent that the relationship between ICTs and resources is such that either of them can affect the other. In each of the cases, the end result of the effect is such that the people

involved are able to convert them to capabilities. To give an example, a person who can afford the training fee will enroll for the training. Upon successfully completing the training they have the potential to convert the ICT knowledge to the valued capability. The end result can therefore be a capability (in cases where the effect is positive and enabling). Where the effect is negative (or constraining), the person won't be able to convert the resource to a valued capability. Those who could not afford the training fee were not able to enroll for the training. They could therefore not acquire the ICT knowledge and hence are not in position to convert the knowledge to capabilities.

There are situations where after one converts the ICTs to the valued capability, they then use the capability to increase some resources. In the illustration above, the financial resources enables one to acquire ICT knowledge. The acquired knowledge becomes the means to achieve the valued functioning, for instance increased income or enhanced communication through ICTs. With the achieved communication, one can increase their networks and friends, thereby increasing their social resources. One can therefore see a cycle where after one converts the resource to a valued functioning, they can then utilize it to increase the same or a different resource. This is illustrated by figure 5.3. In the figure, we see a resource having an effect on ICTs. The ICTs are then converted to a capability. In certain situations, this could be the end but in other circumstances, the capability will enable one to increase the original resource or another resource. There is then a feedback loop back to the resource where it all began.

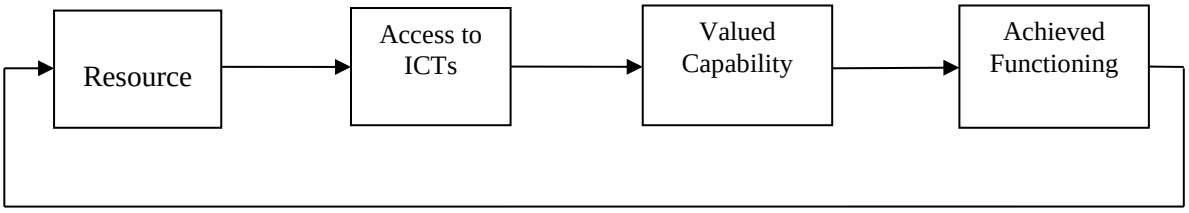


Figure 5.3: How ICTs and other Resources affect each other (Source: Research)

5.2.3 Interaction of ICTs and Resources during Conversion

In this section we explore how ICTs and resources interact during the conversion process. We sought to find out whether the resources act alone or with others, how they interact with ICTs and whether there are other forces that come to bear during the conversion.

For this, we looked at a number of scenarios from some of the interviewed graduates of the training program. We start by revisiting the experience of Informant 6. We began by looking at the way his social resources affected the ICT training and enabled him to enroll and later utilize the knowledge to get employment.

> …when I came to Sega, I was staying with my cousin. Since she had some computers, she asked me to go for the training so that I could learn and then help her work. It was therefore her who asked me to go for the training but I already had a passion for computers but earlier I did not have a place to pursue it since in the village where I came from there was not even electrical power, let alone computers (Informant 6)

This began when he came to live at Sega with his cousin, learned from her of the ongoing training and enrolled after she paid his training fee. In that instance, his social resources – (his knowledge and connection to his cousin) - influenced his enrolling for the training. It later turns out that he was already passionate about computers but had not been able to pursue training. His exposure to the potential of computers came from his primary school teacher who told them captivating stories about what computers will do in the future and got them very intrigued and interested. Before coming to Sega, informant 6 lived in a rural area near Kisumu. Even though he had been exposed to computers and had a passion to pursue them and learn, he had no opportunity since his village had no electric power and computers. Lack of Electric power and computers in the village meant that he did not have access to them and hence could not convert the information resources about ICTs. In this case, ICTs (and electric power) were unavailable in the village and this in turn had an effect such that he could not access, train in and use ICTs. The [lack of] resources therefore are a hindrance to ICT take up and use for him.

We hereby pause to reflect on the interaction between different resources, ICTs and the way conversion takes place. In our discussion above, we saw how informant 6 joined the ICT basic training through his cousin. The cousin must have been aware that ICTs had potential to enable her achieve what she wanted to do (get increased income through operating a Cyber café). This realization came about when through her mental condition (a personal conversion factor), she accessed the information resources about the potential of ICTs. Upon getting the realization, she uses her social resources (knowledge of her cousin) to give him the information on the potential and get him to commit to attend the

training. For the cousin to realize the functioning, she required financial resources (to pay for the cousin to attend the training), and also ICT resources (the computers).

From the ongoing, we can discern a pattern that must be in place if conversion is to take place. It started with the functioning that could potentially be realized through ICTs. To be aware of this potential functioning, the cousin - of informant 6 - required information resources which she accessed through personal factors (her mental condition). From there, she utilizes her social resources (knowledge of her cousin) to give him the information (resources) about ICTs. Informant 6 also utilizes his personal factor (cognitive condition) and agrees to go for the training, which required financial resources to pay for the fees. Once payment is made, the trainee enrolls and goes through the training and gets the ICT knowledge (educational resource). After informant 6 gets the knowledge, the ICTs (computers) are now used to set up the Cyber café, people then come to the cyber cafe and get services for a fee thereby enabling the cousin to realize the functioning (increased income).

We observed another informant's experience to establish how ICTs, resources and factor interact. We review the case of informant 3. We review the experience of informant 3 from the time he learns ICTs.

> I used to see computers and I at the time felt computers were for those who were very much learned, for those at University to do their research work; I did not know that it is something all of us can use. I thought that it was supposed to be used by those who are rich, or the very learned
>
> I had a friend … the one who was installing the Internet, and Access Point (AP) [for SSV]. he called me to help him install that Access Point.
>
> …[after installing the access point, he explained to me how they are working on the computer, and how it enables one to communicate with other people in other parts of the world using Internet, and he showed me how to Google - he just briefed me on that.
>
> … were constructing the Matibabu hospital. … and my boss told me that I was supposed to attend the site meeting on his behalf. …Then came that panel of engineers, and everyone was having a laptop during the discussion - I was sitting in the meeting as someone who is deaf because I could not understand what was happening - questions were being asked and I could not be able to answer, because I could see that everything was

> being looked at from the Internet. The minutes of the site meetings had been sent to each and every contractor's email. So they just open the email and start reading the minutes and I could not. From that point I came to realize that this [IT] is very important.
>
> … I like to know what is happening in everyday life. Even for ICT, I was very eager - after getting an explanation from Lawi Odongo, I was very eager to know much about this because I like to know something better
>
> . As I have said before, after realizing that this thing is very important, I came to class to start learning computers or IT
>
> we require a fee of about K Shs. 3,500 for all the packages. Then we need writing materials, the rest we get from here as we go through the training.
>
> I'm using it to search for information from the other end of the world, I convert it into my business services, then I use this information for communication to other people, especially my clients.
>
> . For example, we are doing something [a job], and we don't have the materials we need for the work on the ground, we now go to the ICT system for communication through the Internet, to contact the manufacturers, outside the country or anywhere they are located, to get the information and organize with them, if they can deliver that particular material on time, so that the work can flow without delay.
>
> Yes - it advances my knowledge. - even my clients which I used to have before, after learning that I now have IT knowledge, the rate of love [respect?] has generated [increased?] because they are seeing me as a modern person, and not as an old [-fashioned?] person. (Informant 3)

The narrative above follows the journey of informant 3 from a place of ignorance about the potential of ICTs to the place of actively using them to carry out his business. It is clear that he was uninformed about ICTs, who could use them and what they are capable of enabling one to do. Through his knowledge of the SSV manager (a social resource), he gets information (information resource) about ICTs and the Internet and what one is able to do with it. This was made even clearer when he represented his boss in a site meeting where the other engineers all had laptops and access to the Internet and they used them in the work, leaving him feeling out of place and clearly disadvantaged since he did not have the knowledge to utilize ICTs, let alone have them. The experience got him thinking (personal cognitive factor) and he found out that there was a training going on

(information through social networks). He could afford the training fee (financial resource) and this gave him access to the training. Upon completing the training, he acquired knowledge (educational resource) that enabled him to utilize ICTs to carry out is business. He says that the ICTs enable him to communicate with clients and get business information (valued functioning). To make the decision to exploit ICTs, he had to first of all know about the potential of ICTs to achieve valued functioning, have access to the ICT training resources and know that he could afford the training, not to mention that he had to be convinced that the ICTs could enable him realize some valued functionings, He therefore had to consult valued capabilities and then use the cognitive factor.

These interactions are captured through Figure 5.4.

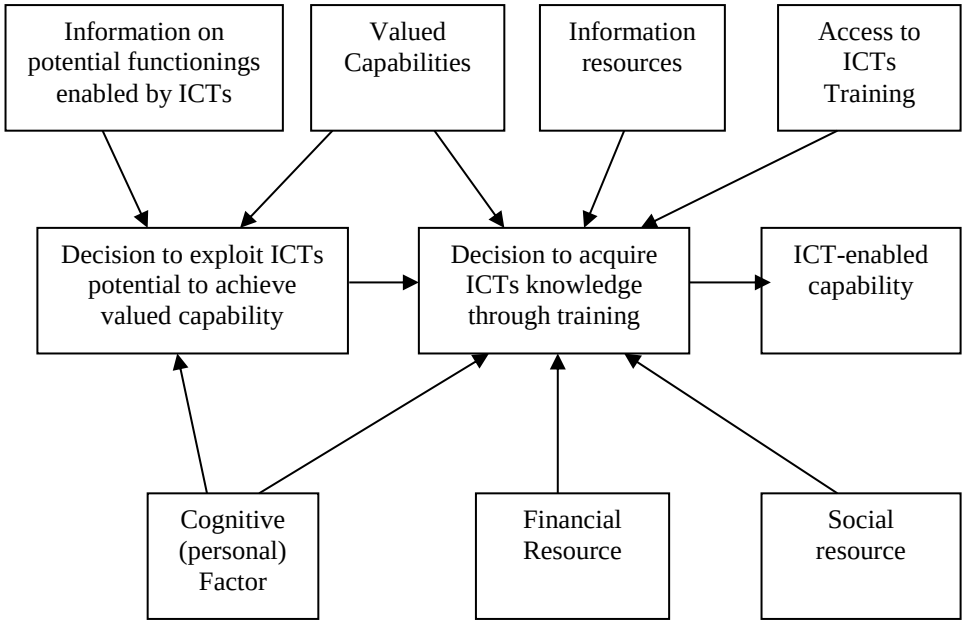


Figure 5.4 Interaction between ICTs and resources (Source: Research)

For the functioning to be realized, all the required resources must be present. When one of the resources is not there, conversion cannot take place. This is because in the conversion of the resources to the valued functioning, the resources can influence each other in ways that can enable or constrain the conversion. Lack of a resource that influences another resource in enabling conversion will lead to a constraint and hence the functioning will not be realized. The cognitive factor must also be enabling.

To illustrate this, we explore the case of informant 6 before he came to stay with his cousin at Sega. We recall that even before the cousin talked to him, informant 6 was already aware about the potential of ICTs and was passionate about them. He was however unable to get the training and use it for a valued functioning because there was no power and computers in the village where he came from. We can utilize the resource interactions in Figure 5.4 to evaluate his former situation.

It begins with the potential valued functioning (ICT-enabled), which the headmaster makes aware to his students through his social resources (his relationship with his students). The students (among them informant 6), utilize this knowledge/information and develop interest and decide they will learn computers when they get the chance, with some like informant 6 getting passionate about them. Upon completing high school, informant 6 is not able to get training in ICTs since in his village there was no ICT training infrastructure (Electric power, computers, ICT training centre). Computers and Power infrastructure are resources. In this case, these are lacking and there is therefore a gap in the resources interactions. With a gap in the resources, conversion does not take place. Once it is clear what needs to be included in the resource interactions to realize a particular functioning, they all have to be there, failure to which we cannot exploit the ICTs to achieve the capability.

Another way to look at it is that the different aspects (factors or resources) in the cycle will facilitate the conversion. The availability of each necessary aspect will enable the conversion while the lack of the same hinders the conversion. One could also say that when resources are influencing ICTs, they do not act singly but can act in groups - either reinforcing each other's effect or acting against one another (i.e. cancelling out each other's influence). To illustrate, we again go through the experience of Informant 6. When he was still in school, his social resources (the relationship with the headmaster),

made him aware about the potential that can be enabled by ICTs (via information resources). This influenced his mental/cognitive condition and he got interested in pursuing ICTs. Upon completing secondary school however, he could not pursue ICTs training because there were no computers or electric power at their village. In this case, social resources acted together with information resources to influence the cognitive condition of the person. We can say they reinforced each other's effect. However, the lack of material resources acted against the social and information resources and cancelled out their effect and hence the person could not pursue the training.

When informant 6 went to Sega, the situation changed. The social and financial resources through his cousin now reinforced the earlier influence of the information resources and he was able to enroll and pursue the training. This took place because he moved to Sega. At Sega the material resources of ICTs and power were available. These resources at Sega (Social, financial, material) reinforced the effect of each other and the person was enabled to undertake the training.

This case brings out an important consideration for conversion to take place. The moving of Informant made it possible for him to convert the resources already available to realize a functioning that he had reason to value. Where he was before, there was no power and ICTs training infrastructure. When his location changed, he was able to convert the resources to a functioning. The change of location enabled the location. Location or geography is an environmental conversion factor. This illustrates an important thing. The socio-environmental context (factors) are key to the achievement of functionings people have reason to value. To illustrate this further, we recall that part of the training entailed learning how to use the Internet. For this to be done, there had to be Internet connectivity through Internet service providers. Further, after the training, some of the graduates went on to use the Internet to achieve the functionings of communication, while others established ICT bureaus and cyber cafés offering Internet services for a fee. With this they achieved the functioning of increased income which they could use to realize other functionings. Without the Internet service this would not have been possible. Without service providers, the services would not have been available. The services needed to be affordable for them to use them. For the people that set up bureaus, the computers they bought needed to be affordable. The availability of Internet infrastructure, Internet

service providers and Internet service affordability is crucial because they were not there a number of years ago. This situation changed due to the socio-political and institutional environment. The environment changed due to a number of government policy decisions, institutional and legal environments (see Section 4.3). From the policy shift and the Communication Act (1998) that re-wrote the telecommunication socio-legal-institutional environment to other subsequent policy decisions like zero rating of ICT products, to lowering interconnection charges with the resultant lower mobile and data connectivity charges. With the laying of the undersea fiber optic cables and the establishment of the National Fiber network, Internet connectivity availability and affordability were affected. All these came as a result to policy decisions on the part of the government, legal framework and the commercial decisions of the telecommunications players. Without these changes, the existing ICTs infrastructure and institutional and legal environment would not be there and hence the people would not be able to access the Internet to what they wanted to do. The social and environmental context had a big role to play in the conversion to functionings people have reason to value. We have capture these interactions in Figure 5.5.

5.2.5: Research Question 1 Summary

As we had indicated earlier, the first research question points to the need to investigate the effect of ICTs on Resources and the effect of resources on ICTs. This led us to interrogate ICTs, Resources and their Characteristics, ICT Effect on Resources and Effect of Resources on ICTs. A number of resources were tracked and their interaction with ICTs explored. We managed to investigate the ICTs in question, the various resources available, the effect of the ICTs on the resources and conversely the effect of resources on ICTs. We have also observed that this ICT-Resource interaction can either enable or constrain the conversion of ICTs to capabilities. A preliminary pattern of the conversion process has begun to emerge. We now briefly outline some of our findings so far in Table 5.1.

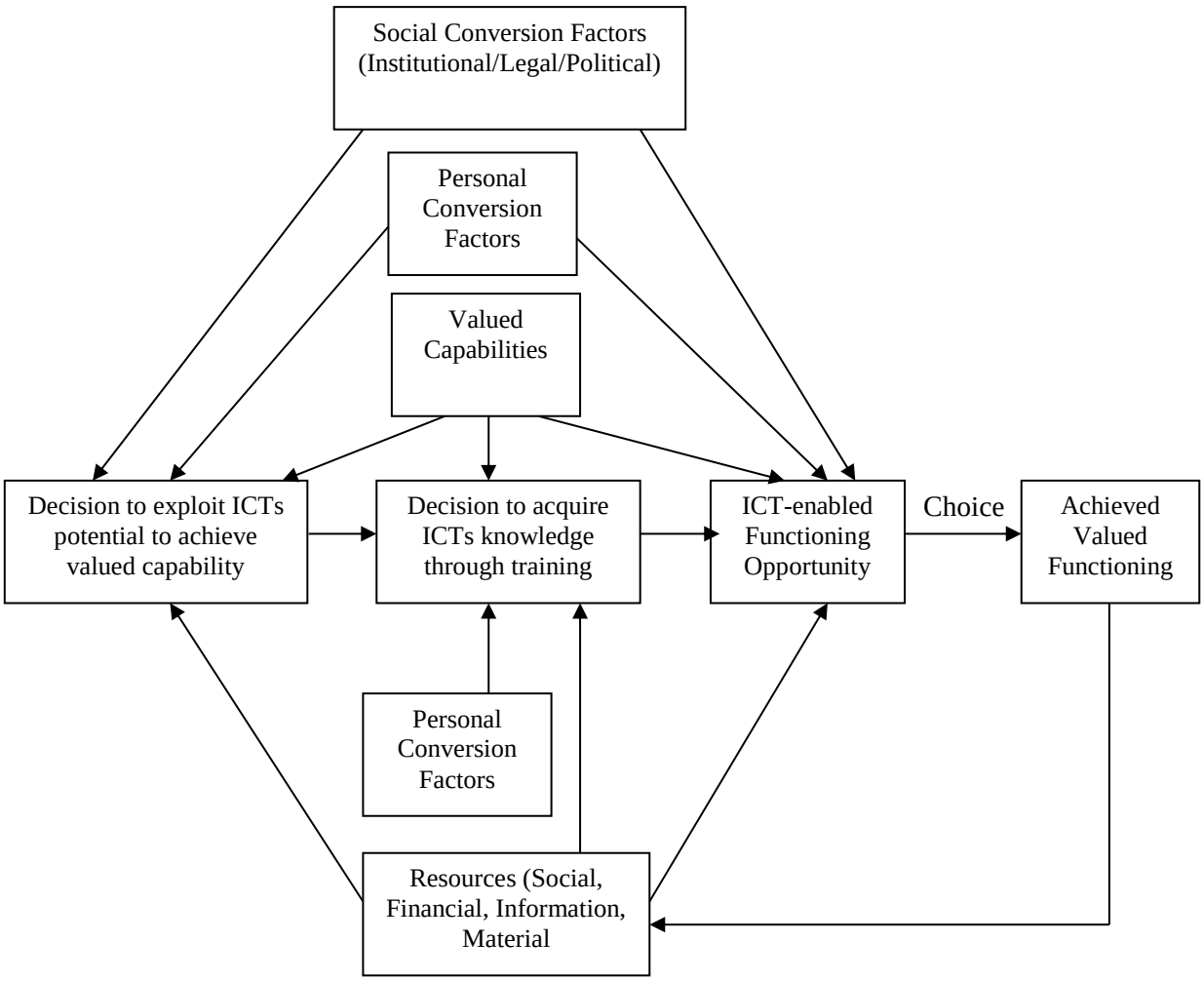


Figure 5.5 Interaction between ICTs, Factors, and resources (Source: Research)

Table 5.1: Research Question 1 Emerging Themes Summary

Research Question	Areas of Investigation	Emergent Themes SSV
1	Effect of Resources on ICTs	• Resources can positively or negatively affect access to and uptake of ICTs and hence the potential of converting them to capabilities • When the effect is positive and enabling, the ICTs can be converted to Capabilities • When the effect is negative and constraining, the ICTs cannot be converted to Capabilities
1	Effect of ICTs on Resources	• ICTs can affect Resources which are the means to expand the capabilities • When ICTs are converted to capabilities, the capabilities can be utilized to increase a resource which can then be converted to other capabilities
	Interactions of ICTs and Resources	• In the interaction between resources during conversion, each of the different aspects (ICTs, resources or conversion factors) can either enable or constrain the conversion • In their influence on ICTs, there are times that resources will not act singly but in groups, either reinforcing each other's effect or cancelling out each other's influence • For conversion to take place, all the required resources must be there. • The conversion process begins with the potential valuable capability

5.3 How Conversion Factors, ICTs and other agency-based capability input resources influence each other during Conversion

In order to shed light on the aforementioned issues, it was necessary to look at the ICT influence on the conversion factors and the influence of the conversion factors on ICTs. We then observed how all this influenced the conversion process. The inquiry was structured along the preliminary codes that had been arrived at earlier.

5.3.1 Effect of Conversion Factors on ICTs

5.3.1.1 Personal Conversion Factors

UCRC

Age

It was clear that Personal Conversion factors had an influence on the adoption of ICTs and hence the potential to be used in the conversion of resources to capabilities. There seems to be a correlation between the decision to take up and use ICTs and the demographics of the community members. Of the community members that enrolled for the training, the youth were more than the older people. It is evident that age was a factor that seemingly influenced enrollment to the training since there were more youth than older people. This was confirmed by two informants – bureau owner and Projects officer in case 1 (Section 4.2.1.8) and SSV manager in case 2 (Section 4.2.2.6). Granted UCRC's intention was that the training would benefit the youth and women, in their awareness creation and mobilization they did not specifically target the youth; rather their outreach efforts were targeted to the whole community. One could even argue that the older people were reached more since they are the ones more involved in community activities, NGO activities, community barazas and churches where the information was disseminated. That notwithstanding, the majority of the beneficiaries ended up being the youth.

> Most of them [trainees] were form four leavers… (Bureau Owner)

> The majority of the trainees are ladies between 18 to 25 years [..]Most of the old people were busy; many people in the area are engaged in business and it is hard to leave your business and go for computer training when you have a family to take care of (Office Assistant)

The graduates to the program seem to agree that there were more youth attending than the older people. The management of UCRC confirmed this when they said that majority of the attendees were form four leavers (see Section 4.2.1.8)

Gender

On the gender question, opinion seems to be mixed, with some respondents claiming that there were more women than men while others said there was no difference. Further inquiry about the profile of the people presently going for training in the training bureaus established and manned by the ICT training graduates seems to lean more towards more women than men going for the training.

> There are more women than men [..] The men feel that the training wastes a lot of time. They say that instead of training, they can go and find some work (e.g. informal work at construction sites) and get some money to use instead of spending months going through the training (Bureau Trainer)

It would seem that the observation that older folk preferred livelihood activities over ICT training applies more to men. The gender question was settled when we looked at the official statistics and confirmed that indeed the women were more than the men. Of the trainees that went through the training in the year 2007, 56% were women (See Section 4.2.1.8).

Cognitive (Mental) Condition

As we continue to consider the personal conversion factors, one that stands out is Cognitive (Mental) Condition. A characteristic of this factor that we encountered was '*Interest'*. Most of the respondents reported that they enrolled for the training because they were interested: for some, their only motivation was interest.

> ...some of my friends could type so fast into the computer, and *I got interested and thought I'd love to do what they did* if I could get training on computers [..] I shared with my friend Emma who was a teacher at the

> resource centre [..] *my interest in getting trained*, she told me she would inform me so that I could join the class (Bureau worker 1)

> *I have had interest of computer*. This started when I was in secondary school. When I was in form one I went to Posta every Saturday then there was a computer there and you could see a mouse. There was a white man there who explained to me what a mouse was and about the function of the pointer. *I started developing interest immediately*. I then went home and talked to my step-brother … He struggled and bought a computer when I was in form two. I can say that *it was through the white man and my brother that I developed interest.* (Bureau Owner)

> I just love computers – I love working with them. I've always had interest since my school days. …I was not doing it for cash. It was just interest (Office Assistant).

It is clear that most of the respondents spoken to claimed to have joined the training because they were interested in ICTs. Upon exploring interest further, it emerged that interest was key to joining the training and seemed to override other factors that ordinarily work against the adoption and use of ICTs for the realization of valued capabilities.

> ...one of my trainees is a girl who completed primary school in 2009 but could not continue. She has had such interest in the training. She normally walks from her home, which is 12 Kilometers away, but comes and spends as much time as possible learning and is presently my best student….This is in comparison to form four graduates who've had their training fees paid for by the parents but who have no interest whatsoever and come for the training on and off. … I am presently training a mama that is more than fifty years old, who is very interested in learning. … Other trainees include people who are working that are more than forty years old (Bureau Owner)

For the case above, everything worked against the girl enrolling for the training but she not only enrolled but ended up performing better than other students. There are also others like the lady more than fifty year old. He also reports of some people who were interested but because they could not afford to pay for the training would get manual jobs at construction sites to get the fees. For the uninterested youth however, their parents would pay the fees but their attendance would be intermittent. Though ordinarily the older working class people have shown little interest in the training, the Bureau Owner reports that among his trainees there would be civil servants and NGO staff. Even though

the civil servants and NGO staff were very busy in their working places, they would still sacrifice any little available time to come for the training due to interest.

We sought to investigate some of the reasons for the development of interest in ICTs. It was established that awareness of the potential of ICTs can positively influence the interest, leading to a decision to enroll for training.

> ….I went through newspapers and I realized that many job advertisements always would require someone who is computer proficient and I therefore developed interest in order to be more marketable (Accounts Assistant)

The Bureau Owner also reports of people who enroll in his bureau because they realize they need computers and Internet to get information and services like mail and job application. It would seem that computer literacy can lead a person appreciating the potential there is in the ICTs.

> … many people are coming for training because people are realizing that they need computer know-how to get information and services from the Internet, for instance downloading forms, applying for jobs, and that for free. They are therefore realizing they need the knowledge and mail services. (Bureau Owner)

For others, exposure to ICTs eventually leads to interest. We have already observed how the Bureau Owner's exposure to ICTs led him to enrolling for training and this later led him to starting a business in the same line. We have also mentioned Bureau Worker 1 who upon exposure to computers at a cyber café in Nairobi through her friends, developed interest and went on to pursue the training. From the ongoing, it can be observed that the mental (cognitive) condition of the person plays a major role in the decision to adopt/use ICTs and later convert their characteristics to valued capabilities.

SSV

Age

It is evident that majority of the trainees were young and many of the beneficiaries who went on to benefit from the training were young. This was confirmed by the SSV manager, when asked about the profile of the trainees.

> The people who come - the majority are youth - the older people are like - 'what does it add to me'? However much we've tried, we've told them the

> benefits of IT(for instance say for agriculture if you are a farmer you can use IT to research on a crop or a disease) mostly the population of the old is down, but youth whether ladies or men, the youth - the number is high.
>
> [..] For the youth, the concept was very clear - because whenever you go, this is the first thing they [youth] ask - so they were like - this is what we need, because for the youth they got it very fast; but for the women who were old, it was a bit challenging because, they were like, ok, 'does it add anything to my table'? But for the youth - both young men and young women - it wasn't a problem because they knew this is what is required in the job market out there - so when it [IT training] came, they were very willing. (SSV Manager)

Another young trainee explains the importance of getting exposed to ICTs at a tender age.

> I can say that having the knowledge at a very tender age is important; it can make somebody to see a lot of opportunities more so from these localities, you may not be able to interact and see a lot of opportunities that are there; […] you can even get a young kid, having a lot of information, having a lot of knowledge, seeing a lot of opportunities in future. (Informant 1)

It is clear from this that the majority of the people that have attended and benefited are the youth, even though the outreach was to the whole community (See also Section 4.2.2.6). It is clear that the youth were able to understand quickly and realize the benefits and opportunities from the ICT knowledge and therefore enroll for the training. It also emerges that of those who trained at SSV, the people who benefited from the knowledge by getting jobs were majorly the youth. It seems credible therefore to conclude that age was a significant factor in the enrollment for the training and using the knowledge to realize what the people valued to do.

Literacy

As we continued to inquire into personal conversion factors, one that seemed important was literacy. We earlier learned that SSV did not require any educational qualification or certification for one to enroll for the training. The manager even said anybody could come, including those who had never been to school. The experiences of some of the trainees however suggested that literacy was important for someone to benefit from the training.

> ...you need to be a little literate in some way ...because for people who are literate they don't struggle so much... it needs some literacy, that one I see but for them .... But you need to have some understanding of the English language; if you have it, you will find it very easy as you work with the computer (Informant 2).

We also learned that the application programs used for the basic training were in English and the instruction also incorporated some use of English. This confirms that literacy is needed for someone to be able to pursue the training and later use it in their lives. This implies that those in the community who were not literate may not have benefited from the training. These community members will never get the potential to convert this knowledge to valued capabilities.

Closely related to literacy is ICT literacy. One of the trainees explains how he had disqualified himself from ever learning and using ICTs because he believed they were for a certain class of people that he did not belong to. On being exposed to ICTs and learning the potential in them, the same person went on to enroll for the training and now uses the knowledge to run his business. This is a unique case because the person had not gone beyond primary school, was working in the informal sector and was discouraged by friends from learning.

> I used to see computers and I at the time felt computers were for those who were very much learned, for those at University to do their research work; I did not know that it is something all of us can use. I thought that it was supposed to be used by those who are rich, or the very learned. [..] after getting an explanation from the SSV Manager, I was very eager to know much about this [..] so that's why I decided that besides doing electrical, because people were telling me - look George, you are now aged, why are you going to class to learn - you are having to sit somewhere and learn. But I said no - I need to learn what is happening today (Informant 3)

Before he got some information about ICTs, he clearly disqualified himself from accessing and using ICTs. The view he had was clearly flawed but that did not stop him from being unable to use it. This same person, after being exposed to computers, made aware of its potential and realizing everyone can learn, enrolled for the training and currently utilizes it a lot in his business. Much as he only had primary school education

and had only learned his trade informally, today he uses ICTs for communicating with his suppliers and clients, for getting information for his business, for keeping records and making reports about his business. Not being literate in ICTs locked him from all these possibilities and upon learning is now able to use them to do what he values. ICT Literacy is therefore important in converting the ICTs to valuable capabilities that can lead to livelihood outcomes.

Cognitive (Mental) Condition.

If we consider the case of Informant 3 we've just discussed when considering ICT literacy above, as long as he believed that computers were for the learned and rich, he disqualified himself from learning and getting the knowledge and would therefore not enroll. When the SSV manager exposed him to ICTs and explained their benefits and opportunities, he became eager to learn more and applied himself to learning even when his friends discouraged him, questioning how an old man can sit and learn. It seems that before the exposure, he had an attitude about ICTs that disqualified him from learning and getting the knowledge. When he got the exposure, this attitude seemed to change and he was now eager to learn and overcome every opposition. Clearly, his mental condition changed and this enabled him acquire the knowledge.

Another graduate of the training program who is now a trainer at SSV tells of people in Sega that have a negative attitude towards ICTs and are reluctant to learn.

> People are really having a negative attitude towards the IT. [..] in the beginning they have a very negative attitude about the IT, especially the parents [..] .and then they are reluctant to know anything about IT. (Informant 2).

For those who enrolled for the training however, their mental condition played a great role

> My opinion was positive....I saw computer was very positive, because it was going to help me not just at that time but also in the near future - I know it is going to help me. So those are my positive motivation towards computer (Informant 4)

Clearly, people with the negative attitude about ICTs were reluctant to know anything about ICTs and would not enroll for the training and acquire ICT knowledge. These

people will therefore not be able to understand and use ICTs and get a chance to convert them to valued capabilities. We learned from Informant 4 above that she had a positive opinion about computers and was motivated to train. Afterwards she used the acquired knowledge for her studies at the university and to get part time work at ICT bureaus during the college holidays. It is therefore clear that one's mental condition can either hinder one from adopting, using and benefitting from the potential they avail to do what one valued, or enable one to adopt, use and benefit from the potential..

To illustrate how the mental condition can affect the decision one makes about embracing and adopting ICTs, we consider the case reported by one of the informants of an old man that requested his help to join facebook.

> It is just the negative belief about IT is what hinders them from engaging ICT. Those who have positive view, they like it. I once had an old man who has a positive view about IT come and ask me to open for him a facebook account. I then asked him, "Why would you want to be on facebook? Will you be able to understand and use Sheng[9]?" He answered and said, "No, I just want to learn about young people and how they behave on facebook so that I can teach my kids not to behave badly". So he has some positive view that through ICTs he can change the lives of his children (Informant 2).

This came as a surprise to the informant who apparently at this point believed that old rural men cannot possibly be on facebook. He therefore openly wondered why the old man would want to join facebook. This old man clearly was informed about ICTs, knew about social media and possible unacceptable or bad behavior on social media and had decided to join so that he could learn and use the knowledge for helping his children. It would seem that the knowledge he had about ICTs had made him have a positive belief leading to a positive view and attitude. This positive attitude must have helped him to decide to adopt and use the ICTs such that even when he learns about the dangers on social media, he does not develop a negative attitude but elects to join, learn and use it. First of all, this old man must have overcome the dominant discourse in the area about ICTs and more so for old people. His belief gave him an attitude which would overcome negative discourses and help him make such a bold decision to join facebook. Instead of being put off by the potential dangers on social media, he decides to use it and convert it

[9] Colloquial for an informal language used mostly by the urban youth of Kenya

to a functioning - being able to instruct his children about online behavior so that they could avoid the dangers inherent online. This is a powerful illustration of what personal conversion factors can enable one to do even when seemingly insurmountable barriers exist. This especially comes home when we contrast this with those whose negative belief causes them not to even engage ICTs and hence miss out on the opportunity to achieve functionings they enable. The effect of one's belief about technology can therefore be very significant.

We have briefly considered a number of personal conversion factors. These include age, literacy, mental condition and gender. As we look at the experiences in the two cases (UCRC and SSV), it is evident that personal conversion factors have an influence effect on people in their quest to adopt and use ICTs. It is apparent that adoption and later use happened more among the youth, who then went on to use the ICT knowledge to achieve what they valued to do. It is claimed that they more readily understood the benefits and easily got interested and this interest proved important in their enrollment to the training. We can conclude that age influenced one's decision to enroll for ICTs and take up and use them, with the youth being more likely to adopt and use. On gender, it also emerged that there were more females than males among the attendees. This is an interesting finding because the world over, there seems to be a gender angle to the adoption and use of technology (especially ICTs) and this mostly tilts towards the male gender. It is therefore unique to observe that in this rural poor community that had never been exposed to ICTs, more women than men embraced it and used it to better their lives. Gender therefore seems to influence people in their quest to adopt and use ICTs, which will later on determine whether they get any benefit from the ICTs.

As for literacy, we saw that the illiterate could not get a chance at enrolling for and pursuing the training. They would therefore be disqualified from later being able to convert the ICTs knowledge to valued capabilities. The final factor we looked at was cognitive (mental) condition. Talking to various trainees, it emerged that some in the community had a positive mental attitude towards ICTs and some had a negative attitude. This affected the people and only the ones positively disposed towards it enrolled for the training. We learned that some of the people interested went against various odds to enroll for the training. We can conclude that these personal factors can act as an enabler

or a constraint in the process of engaging with, adopting and using ICTs for achieving valued basic capabilities.

As we think about personal factors and their effects on ICTs and how they enable or constrain their conversion to capabilities, it is apparent that different personal factors influenced enrolment differently. For age and gender, they influenced the decision to enroll for the training that give one the knowledge to use the ICTs. Literacy can deny one access to the training and hence the acquisition of the knowledge. The cognitive condition can influence one's decision to enroll for the training. It can also affect the access to the training since people with a negative attitude may not all access and enroll for the training. Cognitive condition therefore influenced both access to the training and also the decision to take up and use.

As we review the way personal factors influence the way people will interact with, embrace and use ICTs, we represent in Figure 5.6 the ones we have encountered so far.

The people who do not have access cannot get the ICTs knowledge, which may later disadvantage them from using ICTs to realize valued capabilities. For those whose characteristics disadvantage them from enrolling for the training, they may also be disadvantaged from enrolling for training and later converting the knowledge to valued functionings.

These personal factors either served to enable or constrain somebody from getting access to ICTs. An illiterate person could not enrol for the training and hence was prevented from learning about the use of ICTs. Similarly, a person with a negative mental attitude will chose not to be trained and engage with ICTs. These personal factors therefore enable (or deny) one access to ICTs and their use. People who do not get access to ICTs may not be able to later use it. Then ones with access have the choice to either use or not use. The ones that choose to use it have access to the capabilities that they can enable.

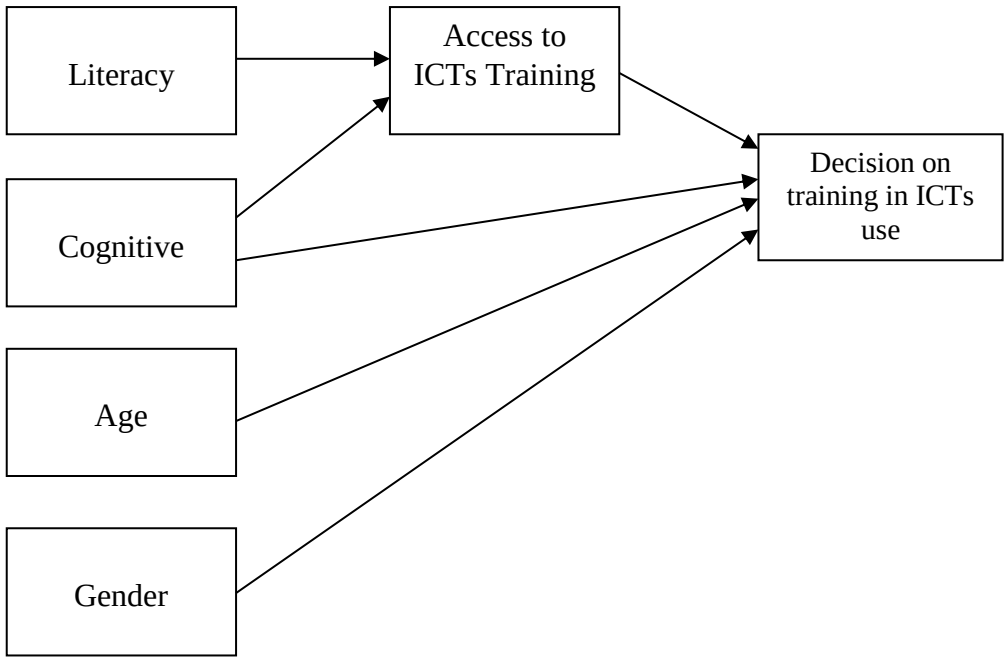


Figure 5.6: Effect of Personal Factors on ICTs Training, uptake and use (Source: Research)

Our study explores the conversion of ICTs to valued basic capabilities. In Section 2.5.4.5, we reviewed the operational interpretations of basic capability. We saw that the long term goal of poverty reduction is to increase the basic capabilities people have, without contracting their overall capability set. This involves identifying long-term valued capability goals and strategies, to work in the short-term to establish functionings instrumental to these goals, to safe guard negative freedoms and to mitigate contraction of wider capabilities (Alkire, 2002). Conception of poverty reduction initiatives/programs therefore ought to involve community participation in order to identify the valued basic capabilities and strategies. In our cases, this was not done since the idea to introduce the ICT intervention came for the NGO (case 1) and the foundation (case 2); the community were brought in during the awareness and implementation. The projects though involved introduction to and training in basic ICTs skills and it was up to the individuals who enrolled for and got trained to decide how to use the ICTs and what functioning to achieve. This therefore gives them the opportunity to select the functioning and the strategy. To establish functionings instrumental to the realization of the capability goals,

the people in this case ought to access the ICTs training, go through it and then take up and use the ICTs to realize what ever valuable functioning they are deprived of. The means for this include ICTs plus other capability in put resources required. The conversion of these means to capabilities is influenced by the conversion factors. In this case we have a number of personal conversion factors, including literacy, age, gender and cognitive. We have seen that literacy and cognitive will influence access to the training, while age, gender and cognitive will determine the take up and use. Take up and use will entail training and once the knowledge is acquired being able to use the knowledge to achieve the valued functioning.

5.3.1.2 Social and Environmental Factors

As we worked towards establishing how different factors affected the conversion of the ICTs to capabilities we turned next to social and environmental factors. There are many of these factors but we considered a few of the ones encountered from the two cases.

Discourses, paradigms and practices

These are the things the community has come to belief and do, the way they do them based on the information they have, their interactions, debates and experiences. Different communities will have differing discourses, paradigms and practices concerning various aspects of their daily life, values, livelihoods, tools, techniques and ways of doing things. For instance, when a new technology like ICTs is first introduced to the community, the way they received it could be influenced by the discourses and paradigms. We captured some aspects of these discourses in the community and the effect they had on the way people interacted with ICTs. We realized that the view of the community members on ICTs affects the decision to access and use them.

SSV

We next look at some of the discourses about ICTs that existed in the community around the time some of the informants enrolled for the training. We begin by looking at some of the negative discourses and paradigms and how they influenced how some people related to ICTs.

> I was being discouraged by some of my friends - that the computer will [as a youth] disorient your mind; because of the bad pictures, those people that walk naked - so they were saying that with the computer you will be ruined and you will find yourself indulging in other things that you are not supposed to like alcohol (Informant 4)
>
> So [for] the community around, [..] there could be some misunderstanding from some people - they say: children who get used to this Internet - they are not morally upright; there is also the issue of people coming to the Internet and you find them just watching movies which are not recommendable and sometime even the Internet is also addictive (Informant 1).
>
> They believe computers disorient the mind of the youth and the children – such things (Informant 4)
>
> The problem we are having here [in this community] is that many people are not willing to follow up and know exactly what is happening with this particular item [the computer/IT sector], but for the few who have heard about it, are appreciating and saying it is a good thing, it's important. But for the few others are assuming that computers are for leisure; the way people are saying that there are dirty films being posted on the Internet, so some people even restrict their children from getting into the computer because they are assuming that once a youth gets exposed to the computer they will get exposed to those dirty films which are being posted on the Internet (Informant 3)
>
> People are really having a negative attitude towards the IT. ... in the beginning they have a very negative attitude about the IT, especially the parents. ...and then they are reluctant to know anything about IT. (Informant 2)

As we look at the experiences reported by some of the people that went through the training, it seems like there existed a negative discourse and paradigm in the community about ICTs. Some of these included beliefs that computers, especially the Internet, will disorient people's minds, making them not morally upright. They believed there were bad images and movies that included immoral movies, nude photos, etc. This made the people develop a negative attitude towards the Internet and computers in general. As a result some went as far as discouraging people from enrolling for the training and others forbid their children from enrolling. The training on offer was basic ICT knowledge and not just the Internet but because of the belief, some of the people became so negative that they were reluctant to learn anything about ICTs. Informant 4 for instance had to overcome

some of the negative discourse for her to enroll for the training: her friends had discouraged her from enrolling for the training, telling her that exposure to ICTs would ruin her morals. Granted that there is inappropriate content on the Internet, this is not all there is to the Internet and there is more to ICTs than just the Internet.

The negative discourse about ICTs made some of the people unwilling to learn, hold back their children from coming for training and discouraging their friends from learning. We see that people who subscribed to the negative discourse developed a negative attitude which affected their decision not to enroll for learning. This shows that the discourses in the community had an effect on the personal conversion factors (Mental condition) and this made the people choose not to interact with and learn computers. This is an example of a social conversion factor influencing a personal factor and in the process affecting ICTs.

We now turn to some discourses that seem to point to positive aspects of ICTs and push for their adoption and use.

> So the community around is happy with IT but there could be some misunderstanding from some people (Informant 1)

> My belief before I came for the training was that having the knowledge will make me different from other people who do not have the knowledge, in different occasions and in different ways, because now I will be able to undertake most of my duties with a lot of ease if I have the knowledge of computer, and my greatest belief also was that with time, the way I was seeing things moving, it will be very important to have the knowledge (Informant 1)

> My opinion was positive....I saw computer was very positive, because it was going to help me not just at that time but also in the near future - I know it is going to help me. So those are my positive motivation towards computer (Informant 4)

From what Informant 1 tells us above, we learn that there were people in the community who were happy with ICTs. She articulates what she beliefs about ICTs in a way that suggests that this may have been an orientation of thought, probably a paradigm about ICTs in the community. This may mean that there was an alternative discourse to the negative one we saw above. The other informant also shows a positive attitude about ICTs. These individuals, who had a positive attitude went ahead and enrolled for the training, learned and acquired ICTs knowledge, which they could later chose to use to

realize what they value. It appears that the discourses in the community had positively influenced these individuals to have a positive mental attitude about ICTs which led them to want to learn and use them.

UCRC

> When I was joining the training my stepmother told my mother not to pay the fees for the training, alleging that people with training in computers do not get jobs [..] My parents tried to discourage me but I ignored (Bureau Worker 1)

It would seem that among community members, there were some who believed that people with computer training do not get jobs. They would thus not see any use to be trained since getting a job was a priority and computer training in their view did not enable it. The step mother therefore advised the parents of Bureau Worker 1 not to pay for her enrolment fee. The parents listened to the discourse and discouraged their daughter from enrolling for the training and it took her determination to actually enroll and complete it. If Bureau Worker 1 had listened to her parents, she would not have enrolled for the training and would have missed to get the ICT knowledge and skill that she presently uses for her livelihood. The discourse and paradigms will therefore have an effect on eventual ICTs use. Clearly the discourse and paradigm will have an influence on the mental (cognitive) factor and this will determine how people relate to ICTs.

> Some people believe IT is for a certain class and they are therefore not interested [..] they are not willing to try (Office Assistant).

For the case above, the belief of some members of the community about ICTs made them not interested in them and they would not be willing to try enrolling for the training.
Discourses and paradigms in the communities therefore affected people's attitude to ICTs, therefore influencing their decision not to learn ICTs.

Looking at the two cases, it is clear that discourses, paradigms and practices had an effect on the attitudes towards ICTs. This in turn affected people's decision to enroll for the training. This is therefore a case of a social conversion factor influencing the personal factor which then affects the final decision on the ICTs. This decision will then determine

whether the person will ever be able to convert ICTs to valued basic capabilities thereby getting the potential to reduce poverty. This is captured in Figure 5.7.

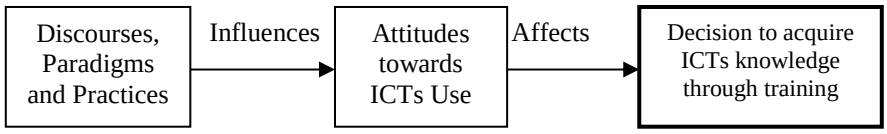


Figure 5.7: How Social and Personal Conversion factors Influences ICTs Training (Source: Research)

Access (to resources, infrastructure, public goods and ICTs)

This is an example of an environmental conversion factor. If people do not have access to ICTs, they will not be able to use and hence get the potential benefit that would come with using it. If one lacks computer literacy, they cannot get access to ICTs. Similarly, illiteracy (in this case lack of English literacy) would deny access to ICTs for the people. We have already observed that for one to enroll for the training, they had to have working knowledge of English since the training was conducted in English and the software packages they were learning were in English. This meant that many potential trainees in the community were disqualified because they were either illiterate or had very little knowledge of English. These people could not gain access to the ICT and hence could not later use it to expand their functionings.

Additionally, those in the community who could not access information [Resource] about the training, either because their village was not reached by UCRC through their networks or barazas, and they did not have the social resource of friends or relatives with this information, could not access the training. This automatically disqualified them from getting the knowledge and skill which they could then use to expand/realize their valued capabilities. In section 5.2.2, we observed that financial resources can also affect access to ICTs. This agrees with empirical evidence from East Africa where it was established that that 'the odds of gaining ICT access improve by more than 100 percent relative to the decline of financial poverty' (May, Dutton and Munyakazi, 2014). Lack of access to these resources meant they will not be able to acquire the required ICTs knowledge, which can enable them get the potential to utilize ICTs. Clearly this access will be

affected by other factors like literacy, geography or lack of resources like information and social networks. This shows that an environmental factor like access can be affected by other conversion factors like literacy and geographical (personal and environmental respectively) and by resources like financial, informational and social. This is therefore an example of an environmental factors being affected by a personal conversion factor and resources. This brings out the interaction that occurs between the factors and resources and how this determines whether the ICTs will be converted to valued capabilities. This is summarized in Figure 5.8 below.

In it we see what affects access to ICTs. Certain resources will curtail someone's access to ICTs. It is important at this juncture to observe that if one cannot get access to ICTs, they will not be in a position to acquire the ICTs knowledge. In our case, lack of access to ICTs means that a person is disqualified from deciding to enroll for the training. If they do not enroll for and go through the training, they cannot acquire the knowledge and ability to utilize ICTs. This means they cannot later use ICTs to achieve what they value. The converse is also true: if one can access ICTs, they may decide to enroll for the training, and acquire the knowledge and ability to utilize ICTs. They could then choose to take up ICTs and utilize them to achieve what they value. Access to ICTs will therefore affect the decision to acquire knowledge and ability to take up and use of ICTs. In the figure we capture Social, Information, and financial resources. We also capture literacy which is a conversion factor. If one of the resources (e.g. financial) curtails access to ICTs, the people will not be able to acquire the knowledge and ability to use ICTs and this may disqualify them from later from realizing as functioning they may have reason to value.

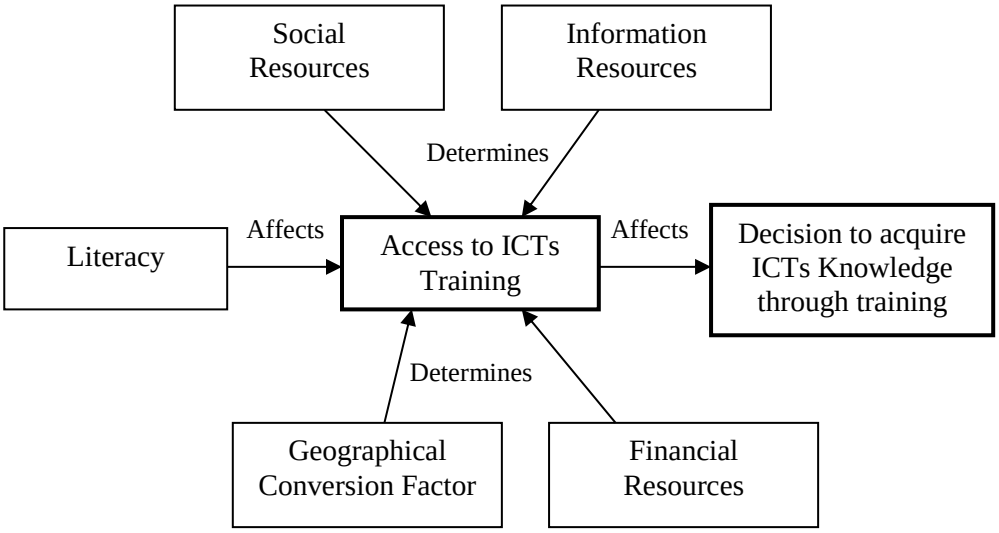


Figure 5.8: Effect of Conversion Factors and Resources on ICTs training (Source: Research)

5.3.2 Effect of Resources on Conversion Factors

In our quest to understand how conversion of ICTs takes place, we interrogated the interaction between resources and conversion factors. We looked at examples from the two cases with a view to getting a general pattern to explain the process.

UCRC

One of the factors that consistently came out as important in the decision to enroll for the training and later to use the knowledge in one's life and livelihoods is 'Interest.' Many of the graduates of the training claimed to have had a lot of interest and this played a great role in determining their eventual decision to enroll. Interest talks of a positive mental attitude towards something and this is therefore indicative of the cognitive / psychological state or condition. Cognitive state or condition is be part of the psychological state which is a personal factor. We took time to look at some of the explanations given as to why people developed interest.

Earlier, we saw the case of Bureau Owner who explains how he developed interest. He tells how he visited the post office on Saturdays where a 'white man' took time to introduce him to the computer and its operation and this made him 'develop interest immediately' (see Section 5.3.1.1). He then talks about his brother later purchasing for

him a laptop and explains that it was through these two that he developed interest. In the same section above, we encountered the case of Bureau Worker 1 who after observing her friends using the computer at cyber cafés developed interest. Another person is Accounts Assistant who claims that he went through many job advertisements in the newspapers and realized most required proficiency in ICTs. This made him get interested 'in order to be more marketable'. These are all an example of the information resource influencing the mental condition. The experience of Bureau owner as a trainer shed light on reasons why people get interested in ICTs.

> Many people in the area have interest in computers. Many people are coming for training because [they] are realizing that they need computer know-how to get information and services from the Internet, for instance mail services. There are other people that show a lot of interest – these are people who work for the government or NGOs [..] this is because they are adults and know what they want [..] these are people who buy computers but would like to learn how to use them. At some point before this, people did not see the need for this knowledge [..], she was not interested [..] because she did not see the need (Bureau Owner).

From the examples above, we see a number of reasons why people developed interest in ICTs. Two of the people claim they got exposed to ICTs through acquaintances and friends who either explained some basics or they observed them working with them and in the process got interested. Exposure to ICTs through other people got them interested. Other people that developed interest did it as a result of realizing they need computer knowledge in their life and livelihoods. For those that had shown no interest, we learn that it was because they did not see their need for the knowledge. It is evident that exposure to ICTs and the realization of the need for them in one's life can cause them to develop interest. The exposure and realization can be looked at as information resources. This information came through different channels, for instance through friends and acquaintances. This is an example of social resources at play, causing people to develop interest, and demonstrating how resources can affect personal factors.

SSV

We revisited the responses of a number of former trainees and from their reported experience got some insight on the way resources affected conversion factors. We begin

by looking at the experience of Informant 6 who says they got to know about ICTs through their head teacher in primary school.

> When I was in primary 8, our science teacher - who was also the headmaster of the school - used to tell us that we must make sure we learn computers. He would tell us that even for those that imagined they will look after cattle when they grew up there will be robots (controlled by the computer) that will look after and take care of the cows. He even told us that for those who were planning on pursuing a driving career, in future they will design computer-controlled cars that will operate without drivers. He therefore told us that it was mandatory to learn computers. When we heard this we said, "Wow, it seems everything will be controlled by computers!" [..]We therefore told ourselves that we must learn computers. [..] Some people still took computers for granted while for people like me I took it very seriously. (Informant 6)

This headmaster clearly left an impression on the minds of his students and this shaped their belief about ICTs and this must have played a role in the decision of Informant 6 to take up and use ICTs. We encountered this person earlier when we learned that upon moving to stay with his cousin in Sega, she asked him to enroll for the training, acquire ICTs knowledge and help her set up an ICT bureau. He explains that even before he came to Sega he had a 'passion for computers' and the reason he had not learned was because there was no electricity in his village (See Section 5.2.4). It is evident he got the 'passion for computers' when their headmaster painted a picture of his version of the future with computers. This left a great impression on the young minds and informant 6 says he took it very seriously and decided he would learn computers in his life. When he got the chance, he enrolled for the training and acquired he knowledge. This version of how computers will be used in the future looks like some discourse and paradigm the headmaster subscribed to. He shares this with the young students and this created an interest in them and a determination to learn and use ICTs later in their lives. The students were exposed to this and this influenced their belief and attitude about ICTs. These beliefs must have formed a positive mental attitude (personal factor) towards ICTs. In explaining this, we see that the headmaster subscribed to a certain discourse. We see a social factor (discourse and paradigm) through a social resource (headmaster) influencing beliefs and attitudes which help to establish a mental condition about ICTs.

We also look at Informant 4 who explains that before she came for the training she believed that having the knowledge of ICTs would make her different from other people and that ICTs would become very important (see Section 5.3.1.1). This was before she learned about ICTs. This would indicate that she must have got this from some of her friends and acquaintances. Again this could have been some discourse which she explains she came to learn through friends. This is another case of someone getting interested in ICTs through social resources because of the positive belief about ICTs.

We also recount the case of informant 3 who had a belief that ICTs were for the educated in universities to do research and for the rich. He then got exposure to ICTs from the SSV manager and developed interest and opted to enroll for the training against the admonition of his friends and contemporaries. The interest he had developed propelled him through and he enrolled, and began utilizing ICTs in his business. It is the exposure and awareness (information) he got from the manager (Social resource) that caused him to develop interest and influenced his mental attitude to want to enroll for the training, even going against the existing paradigm and discourse in the community that ICTs are not for old men like him and that they had immoral content. He explains why he joined the training.

> But to me, I like to know what is happening in everyday life. Even for ICT, I was very eager - after getting an explanation from the SSV Manager, I was very eager to know much about this because I like to know something better - I lack words - but I like to understand things better before I can [migrate] from one place to another, I need to know it in a way that I can be able to explain it in case I'm being approached. So that's why I decided that besides doing electrical, because people were telling me - look George, you are now aged, why are you going to class to learn - you are having to sit somewhere and learn. But I said no - I need to learn what is happening today, rather than sitting where I am. So it is just motivation - I just decided to get to know what is happening in the modern life.

He says that upon getting the initial exposure about ICTs, he was eager to know more about it. He says that he is a person who likes to understand things very clearly before he can embrace and move to them, and was motivated to know more about what is happening in the modern world. Here we see a personality that is eager to learn new things, eager to explore, eager to properly understand before adopting them. From this we

see that his personality was instrumental in him persistently pursuing the new knowledge with determination. This indicates to us that the personality of a person and their psychological makeup can play a role in adopting a new technology like ICTs. In this case we see a person's mental attitude influenced by a number of issues including information and social resources. We also saw the case of Informant 2 who hated computers because of what he believed about them from his father. After the manager of SSV explained the benefits of ICTs, his attitude changed and he developed interest and enrolled for the training.

In summary, we capture the effects of resources on the mental attitude towards ICTs through Figure 5.9. Mental condition is very important because it will determine whether the person will decide to embrace ICTs. In this case the mental condition determines whether the person will enroll for the training and acquire ICT knowledge. Those who get the knowledge have the potential to use it to achieve what they value. The people with ICT knowledge can convert it to a valued capability. We have established that the attitude can be influenced by new information about the potential benefits of ICTs. This awareness and information will often come through our social networks (friends, family, workmate, acquaintance). This is an illustration of how resources influence the conversion factors and how these factors play a part in the conversion of ICTs to capabilities.

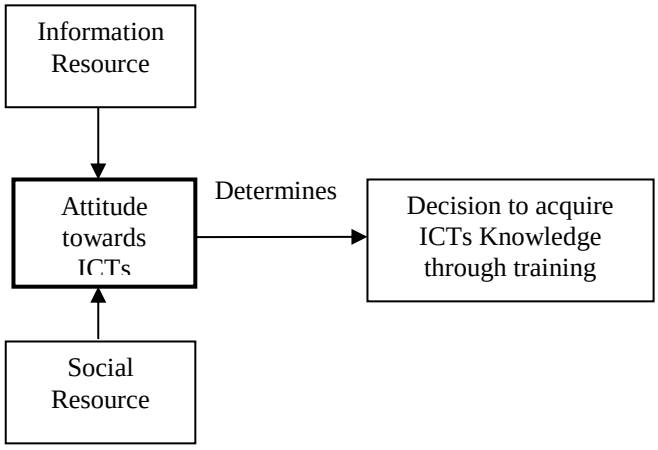


Figure 5.9: Effect of Resources on Mental Attitude towards ICTs (Source: Research)

5.3.3 Interaction of Conversion Factors during Conversion

In the previous two sections, we explored the way conversion factors interacted with resources and ICTs. We observed that conversion factors will influence ICTs and resources. We also met situations where the conversion factors are influenced by resources. It also emerges that conversion factors can affect other conversion factors.

In figure 5.8 we represented situations where an environmental factor (Access to ICTs) is influenced by Geographical conversion factor and resources (Informational and Social). We also saw how the access factor is affected by Literacy which is a personal factor. This is a situation where a factor (personal) affects another factor (environmental). When we look at figure 5.7, we observe a scenario where a social factor (discourses and paradigms) influences people's attitude towards ICTs either positively or negatively. Attitude towards ICTs will determine whether a person will embrace, learn and ultimately use ICTs. This is a case of a social factor affecting a personal factor. From the ongoing, it is apparent that during conversion, it is possible to have conversion factors influencing each other, which in turn affects the conversion of ICTs to capabilities. This is captured in Figure 5.10 below.

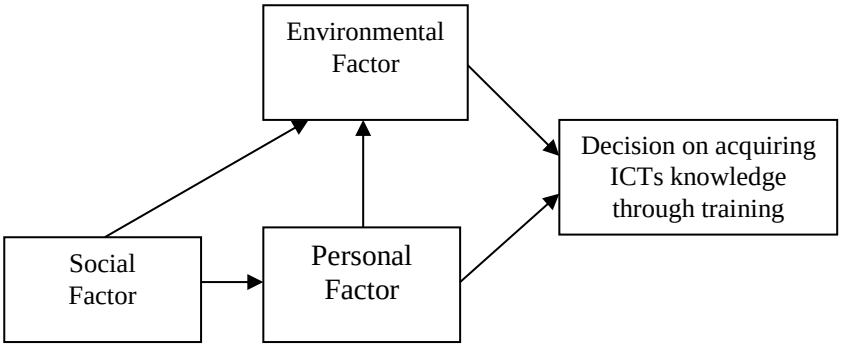


Figure 5.10: Interaction of conversion factors during uptake and use (Source: Research)

In the figure, we capture the interaction of factors. It emerges that personal factors can influence environmental factors and social factors can influence personal factors. It is possible that in other scenarios there could be other combinations of factors influencing other factors. As the factors influence each other, their resulting action will have a bearing on the decision to enroll for training in order to acquire ICTs knowledge. It is important to note that the environmental factor (in this case access to ICTs) has an effect

on the decision to acquire ICTs knowledge through training. Where the environmental factor is constraining (i.e. one cannot get access to ICTs), they will not be in a position to make a decision to acquire ICTs knowledge. Similarly, if the personal factor is constraining (in this case a negative mental attitude towards ICTs), the person will opt not to acquire the ICTs knowledge through the training. If on the other hand the personal factor is enabling (in our case a positive mental attitude towards using ICTs), a person may decide to acquire the knowledge via training, which will give them the knowledge, and with it the potential to utilize ICTs.

What is emerging is that the conversion factors interact with each other and influence the resources. This influence has an effect on the final decision whether a person enrolls for the ICTs training and this will determine whether they will get the knowledge and ability to utilize ICTs and hence their ability to use the ICTs knowledge to achieve what they value. This decision whether to enroll for the training and hence position oneself to a place where they could potentially use the knowledge is important as it will determine whether they will ever convert the available ICTs to capabilities. We have observed that this all important decision will be influenced by the mental attitude towards ICTs. The attitude that one has is determined by a number of forces. One is the existing predominant discourses, paradigms and practices. This has to do with what someone believes about ICTs and how they use them or plan to use them in their lives. Another aspect affecting the attitude towards ICTs is the social, information and Psychological resources. The decision whether to acquire ICTs knowledge is influenced by access to ICTs (an environmental factor) and some resources (see Figures 5.8 and 5.9). We have seen that where access is enabling, the person may decide to acquire ICTs knowledge. On the other hand, where access is constraining, the person may never decide to acquire the knowledge (through training).

Figure 5.11 outlines the forces that influence the decision/intention to acquire the knowledge to utilize ICTs. When a person makes the decision to adopt and use ICTs, a key consideration affecting this is a person's valued capabilities. Where they perceive that the ICTs can enable them achieve capabilities that they value, chances are that they may decide acquire the knowledge to utilize them. If they do not value the ICT-enabled capabilities, the people may never choose/decide to acquire the ICTs knowledge. The

people in the community will become aware of the possibilities that ICTs will enable from the information they will receive when the ICTs are being introduced. Through the informational and social resources during the preparation for rolling out the ICTs, some information will get to the community. This may include what the new technologies are, what they enable one to do and the benefits for using them. The implementation agency has to do this because most likely the ICTs may be new to the community. For the poor, they will compare the ICT-enabled capabilities against the valued capabilities they are deprived of. Clearly, these capabilities have to do with the everyday lives and livelihoods of these poor communities. The people that choose/decide to acquire the ICTs Knowledge may later use the knowledge and covert the ICTs to their valued (deprived) capabilities. The (deprived) valued capabilities therefore play an important role in the decision to acquire the ICTs knowledge. For those who enroll and go through the training, they will acquire the knowledge to utilize the ICTs. They may then later use this knowledge and ability to achieve what they value.

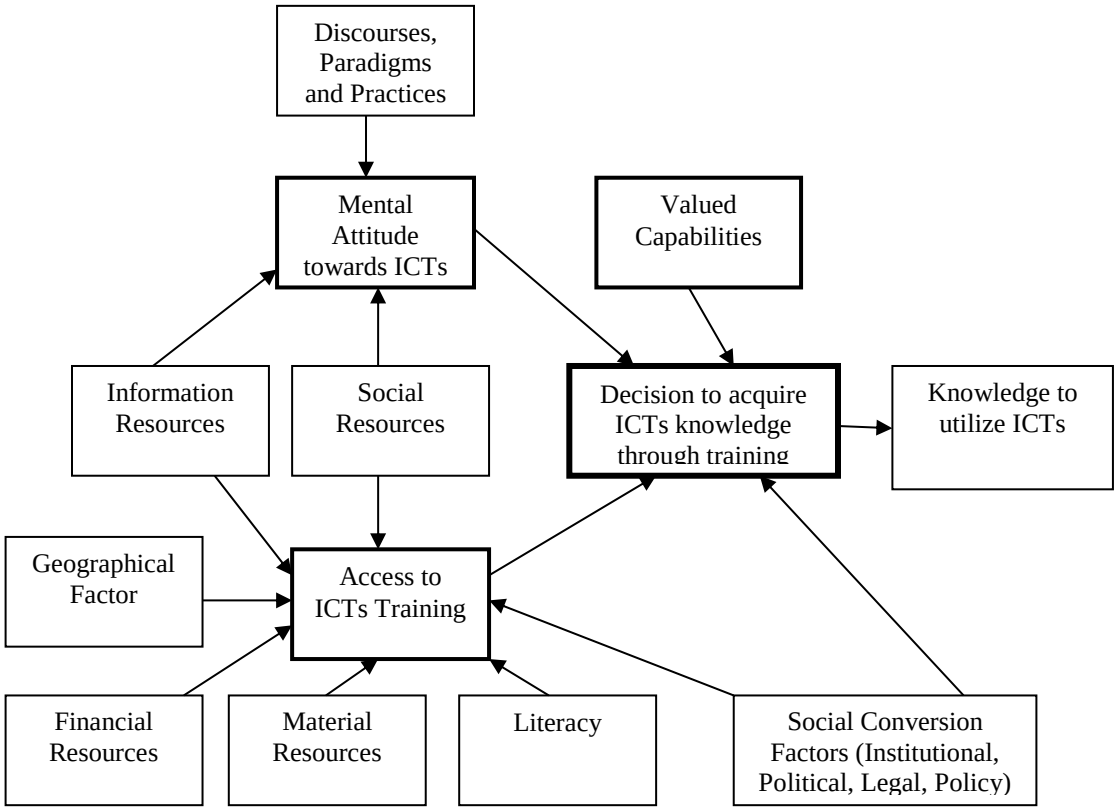


Figure 5.11 Forces influencing decision to acquire ICTs knowledge (Source: Research)

A careful examination on 'Decision to acquire ICTs knowledge' brings to mind the issue of technology adoption. This is because ICT initiatives often introduce ICT interventions which are new to the poor rural community. The community therefore needs to adopt the technology if they are ever going to benefit from the introduced intervention. In our study, the poor must decide to enroll for ICT training and acquire the knowledge, for them to later use the knowledge to exploit the potential for achieving the valued capability. One aspect of our study is therefore about how the poor communities go about adopting these technologies. We sought to look at their experience and contrast it with established theories of technology adoption.

As we look at the issue of ICTs adoption by these poor communities, a number of issues begin to get clearer. The 'decision to acquire ICTs knowledge' is very important if the person will later use the ICTs. We see that this can be influenced by beliefs and attitudes and also by 'Access to ICTs.' These beliefs and attitudes are influenced by a number of issues that include among others, the existing discourses, paradigms and practices in the community. Awareness and exposure on the potential and benefits of ICTs can also help to determine one's belief and attitude about ICTs. For a person to get new information or be exposed to an existing discourse about ICTs, their social network is an important channel. Finally, we also saw that the psychological constitution of a person could also play a part in developing the belief and attitude about ICTs. Since the decision to adopt and use is affected by the attitude, we can say that the use of the ICTs will therefore be affected by the factors and resources affecting attitude. We have also seen that the capabilities that a person values will be key in their decision/intention to use ICTs.

As we considered that attitude – which plays a role in determining the intention to adopt and use – is affected by discourses, paradigms and practices, awareness and exposure about the potential and benefits of ICTs, and the social resources, we observed an important issue emerging. When we are introducing new technologies to a community, these issues require careful consideration. This is because these issues can make a person/household develop a negative attitude that causes them to have no intention of taking up and using the technologies. For adoption therefore, we must ensure people develop an attitude that will make them decide to acquire the ICTs knowledge. In

communities where people have a negative attitude or could develop one, we need to make sure we intervene in the issues to ensure people develop a positive attitude. In line with CA, coercion is not an option because people must value a functioning or a means. CA recommends that where it is felt that value change needs to be brought about, we need to have community participation where there is community debate and education. To realize a positive attitude we need community participation. One way that has been suggested is to use a champion in the community where they engage the community and bring about awareness and education through participation. They can introduce the debate and intentionally direct it to what they desire through participation. This agrees with the suggestion that ICT champions are necessary for the ICTs to be successfully adopted.
We have also observed that the decision to adopt will be influenced by Access to ICTs. Access in turn is affected by resources (e.g. financial, social and informational). Those who decide to adopt and use ICTs may go on to use them and in the process convert them to valuable capabilities. Those who do not make a decision to use them may never use them and will therefore not be in a position to convert them to valuable capabilities.

We sought to review some of the models that have been used to predict the acceptance and adoption of technology. The most predominant among them is the Technology Acceptance Model (TAM) by Davis (1985). The Model has undergone numerous reviews and adjustments but it is universally used to predict technology adoption. The model proposes that a person's behavioral intention to adopt a technology is determined by the perceived usefulness (PU) and Perceived Ease of Use (PEOU), and these are influenced by other external forces. TAM was informed by another model, the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975). TRA says a person's behavior is determined by their intention (behavioral intention) to perform the behavior, which in turn is determined by the attitude the person has towards that behavior and subjective norms. Attitude in this context is the positive or negative feelings a person has about performing the actual behavior based on the person's salient beliefs about the consequences of performing that behavior (Fishbeing and Ajzen, 1975). Vankatesh &Davis (1996) adapted the theory by replacing attitude and subjective norms with the constructs PU and PEOU.

Another theory used to predict behavior is the theory of Planned Behaviour (TPB) by Mathieson (1991). TPB says that a person's intention is determined by attitude towards the behavior, subjective norms and perceived behavioral control. Attitude in turn is affected by behavioral beliefs and outcome expectations.

TAM has undergone many reviews and adjustments as researchers have sought to validate the model for different domains, environments, contexts and ICT technologies. Musa (2006) used a revised version of TAM to study ICTs adoption in Nigeria and Kenya. Vankatesh et al (2003) reviewed 8 models dealing with adoption and came up with the unified theory of acceptance and use of technology (UTAUT) model. The constructs of the UTUAT model includes performance expectancy, effort expectancy, social influence and facilitating conditions, in additional to the moderators (i.e. gender, age, experience and voluntariness of use). Social influence factors talks about the effect of society, its values, beliefs and influence of key people on the decision of a potential adopter to use an innovation. Facilitating condition talks about the degree to which a person intending to adopt believes that there exits resources and infrastructure to use the innovation (Ochieng, 2012).

The adoption models address the issue of adoption of technology. Most of the models were informed by Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). They outline the factors that influence behavioral intention, which in turn influences the use behavior. Vankatesh et al (2003) reviewed the major 8 models and identified the main factors that various models deal with.

Table 5.2: Comparison of Adoption Models (adopted from Vankatesh et at, 2003)

Model	Explanation	Core Constructs
Theory of Reasoned Action (TRA)	Derived from psychology; is one of the most influential theories of human behavior	1. Attitude towards behavior 2. Subjective norm (perceived social pressure to/not to engage in an activity)
Technology Acceptance Model (TAM) and Improved TAM (known as TAM2)	Tailored to IS contexts, designed to predict ICT acceptance and usage on the job	1. Perceived usefulness (PU) 2. Perceived ease of use 3. Subjective Norm
Theory of Planned behavior (TPB)	Extended TRA by adding perceived behavioral control	1. Attitude towards behavior 2. Subjective norm 3. Perceived behavioral control – perceived ease or difficulty in performing the behavior
Combined TAM-TPB	Combines the predictors of TPB with perceived usefulness and perceived ease of use of TAM to provide hybrid model	1. Attitude toward behavior 2. Subjective Norm (SN) 3. Perceived behavioral control (PBC) 4. Perceived usefulness (PU)
Innovation diffusion theory	Grounded in sociology and used to study a variety of innovations	1. Relative advantage – degree to which an innovation is perceived as being better than the precursor 2. Ease of use – degree to which an innovation is seen as being difficult to use 3. Image – degree to which an innovation is perceived to enhance one's image 4. Visibility – degree to which one can see others using a system or innovation 5. Compatibility – degree to which an innovation is perceived as being consistent with existing values, needs and past experiences of potential adopters 6. Results demonstrability – tangibility of the results of using the innovation 7. Voluntariness of use – free will to use
Social cognitive theory	Most powerful theories of human behavior which has bee extended to context of computer utilization	1. Outcome expectations – Performance – performance–related consequences of behavior 2. Outcome expectations – personal – personal consequences of behavior e.g. esteem, accomplishment, etc. 3. Self efficacy – judgment of one's ability to use technology 4. Affect – individual liking for a particular behavior 5. Anxiety – evoking anxious or emotional reactions when performing behavior

As we consider the constructs of different models, what emerges is that many of them deal with behavioral intention use the technology. This is indeed in order since that what they are theorized to address. A number of them seem to have constructs that could be close to what our model addresses. For Perceived Usefulness, one reason that the users perceive that the technology is useful could be that it may enable them accomplish or do something they have reason to value. Others (e.g. subjective norms and visibility) have to do with the influence of the community on how one perceives the technology, which may go to influence one's beliefs and attitude the technology. A number of others have to do with attitude towards behavior. Most therefore address the issue of behavioral intention to adopt the technology. The 'outcome expectation (personal) construct of Social technical theory, and 'compatibility' of the innovation diffusion theory seem to come close to addressing 'reason to value' that capability approach advocates. Most the theories therefore seem to stop at behavioral intention and do not explicitly address the issues of value. It is also noteworthy to observe that most deal with adoption at organizational level while our model deals with introduction of technology at the community level.

The Unified Theory of Acceptance and Use of Technology (UTAUT) (Vankatesh et al 92003) 8 of the major adoption models. The constructs of UTUAT include performance expectancy, effort expectancy, social and cultural factors and facilitating conditions and these are moderated by age, gender, experience, and voluntariness. The Social and Cultural factors have to deal with the effect of society's values, beliefs, and influence of key people on the potential adopter's decision to an innovation. This is an interesting construct because it alludes to the aspects that would influence persons in the society and therefore determine what a person has reason to value. This therefore deals with the issue of value. The construct of facilitating conditions deal with the degree to which a potential adopter believes that there exists resources and infrastructure to use the innovation. UTUAT therefore incorporates aspects that our model deal with including the value and resources.

These models deal with the prediction of acceptance and use of technology mostly in organizations. Even for UTAUT, it doesn't explicitly deal with establishing whether the people have reason to value a technology and they also fail to explicitly deal with

establishing whether one has the ability to utilize the technology. The models are also silent on the effect of the social and environmental factors and their effect on access of technology which is very important for the introduction of new technology in a community.

We summarize our findings on research question 2 in Table 5.3.

Table 5.3: Research Question 2: Summary of the findings

Area of Investigation	Emerging Themes
Conversion Factors Influence on ICTs	I. The factors that influenced people in their decision to acquire ICT knowledge included: • Mental attitudes towards ICTs • Access to ICTs II. Mental attitudes towards ICTs are influenced by discourses and paradigms (a social factor) III. Access will be affected by personal factors and Social conversion factors
Resources Influence on Conversion Factors	I. Resources can affect conversion factors which will influence the conversion of ICTs to Capabilities II. The resources that affect a person's mental attitude towards ICTs (a personal conversion factor) include: • Social • Informational III. The mental attitude will in turn influence the person's decision to acquire knowledge on how to utilize ICTs IV. Access is affected by resources, including financial, material, social and informational
Effect of Conversion factor on conversion factor	Conversion factors can affect each other. • Social factors can affect personal factors • Personal factors can affect environmental factors

5.4 Conversion of ICTs to Valued Capabilities

We have conceived capabilities as the 'opportunity set of achievable functionings associated with basic capabilities.' This set includes the existence of choices of valuable functionings, the awareness of the existence of valuable choices, and the ability to make valuable choices (including exercising of negative freedom). To summarize, we will need to interrogate the following:

- Existence of choices on valuable functionings
    - Establishing that ICT-enabled functioning opportunity is valuable
    - Ability to select the choices that lead to ICT-enabled functionings
- Decision on the use of ICTs

As we look at the conversion of means (in our case ICT) to capabilities, we consider that capabilities were defined as the freedom to pursue/promote or attain what one values to do or to be, which is also defined as the opportunity set of achievable functionings associated with basic capabilities. This opportunity set of achievable functionings can be thought of as the existence of valuable functioning choices, the awareness of the choices and the ability to choose. We sought to get what potential functionings the people perceived are enabled by the acquired ICTs knowledge, their awareness of the same and ability to achieve.

5.4.1 Potential of ICTs to Expand Valuable Functionings

As we begin to explore how the conversion of ICTs unfolds, we consider the potential valuable functionings that are enabled by ICTs. After people have acquired knowledge on the use of ICTs, they will need to identify valuable functionings which ICTs can enable them achieve. We now review the experiences of various informants after they completed the training and went about using their acquired knowledge to achieve valued functionings that they had been deprived of.

UCRC

For a person to convert ICTs to capabilities, they must first know or realize that ICTs can be used to achieve the capability. If they do not know, conversion will never take place.

We look at the functionings that various graduates of the ICT training were able to achieve through ICTs. This will give us an indication of the functionings that they must have been aware of since one cannot achieve that which they were never aware of. If the person does not know that the ICTs had the potential to realize the capability, then they will not pursue it. We also look at some of the functioings that the informants indicated could potentially be achieved through ICTs. Granted this list comprises of what the few informants gave us, it gives an indication of some the important ones. In Section 4.2 and 5.2, we looked at some of the potential functionings that various persons at UCRC achieved through ICTs. Bureau owner talked about using proceeds from his business to build himself a house. In a similar way, Bureau trainer built himself a house from his employment proceeds. Others include getting employment, educating siblings, purchasing food, and communicating through the Internet. Others talked about using the proceeds from the employment to get their basic needs met and to get pay for health services, while another said that it gave him a sense of pride. Some of these are functionings while others are means to achieve functionings. Employment is a means to getting money which also is a means to getting valued functionings. Communication also is a means to achieving valued functionings. These functionings (and means to functionings) were realized upon the utilization of ICTs. We can therefore say that the people identified that ICTs could enable them realize the functionings and they pursued them.

SSV

We observe the experience of one of the informants.

> Just after completing the CISCO Essentials training, ... It so happened that there were three people who needed to buy Laptops, and another needed to buy a desktop PC [..] Then one brought his laptop, I did everything and it worked well. The person went around telling people, "We have a computer wizard here; take to him everything." Since then many people have been coming to me with various computer issues and in that process I have also been training them how to have positive view about the IT. So mostly what I have done is to change people's view about the IT and now in that center (Kogere CKC) many people are coming (Informant 2).

From the ongoing, we can observe that informant 2 identified what he could do with the knowledge he had acquired ICT knowledge as a means enabler for others and for himself. As he installed the operating systems for people this led to more community awareness that in turn brought in many people for other ICT-enabled services during which time more awareness of the potential of ICTs is spread, leading to further adoption and use. Informant 2 further explains that he provided different services (computer-related, phone-related, etc,) for a small fee to those who could afford to pay. He explains how he used the payments to help his 'materially-challenged family' by giving it to his mum to start a small business that helped her become self-reliant. The knowledge therefore enables access to the means (in this case some money) to realize what he valued (helping the mum start a business). This enabled him attain this functioning for himself and gave the mum the means to realize some other functionings of taking care of her family.

Further, when asked how his life had changed since acquiring the ICT knowledge, Informant 2 enumerated a number of areas.

> So when I went to the ICT center (SSV) I got myself interested and with the skills I could now implement certain things, "Google" some information ... and I found myself being self-dependent and stable[..] So it has changed my life and has given me some sort of courage to continue with life knowing that every opportunity you get is an advantage and you go with it [..]. and people around are saying, "Oh, we see somebody who will be very great here!" You also gain respect because of what you can do. For instance somebody's phone has a problem - it has refused to open and they come to you and say, "You are the computer expert, can you assist me with the phone?" ... When the owner comes for it the next day I tell them, "It is fine. Now you see, you need to know something about computers so that in future you will be able to solve such problems yourself .... So you gain some respect. (Informant 2)

On being asked how the ICT knowledge he had acquired had increased the choices in his life, Informant 2 had the following to say:

> There are many choices. Before I learned, I was just illiterate. I couldn't have done this CISCO [essentials course], I couldn't have gained the respect from the community, I couldn't have had social courage as a person, because I was demoralized by the [poor] status of my family, and so it has given me so many choices, for example, through it I can get some money, through the knowledge establish some business, improve farming skills, I can be able to learn online. I can therefore major in IT so that I can

> improve my business, then I can 'Google' things that I can do for the business, I can choose to improve my farming skills, through ICTs or choose to pursue my academics as I do other things at the same time.

Informant 2 identifies different valued functionings he has been able to achieve by utilizing the ICT knowledge. These include

- self-dependence,
- helping his family,
- social ‘courage’ to continue with life
- Financial gain
- Improve farming skills
- Learn online
- Start a business
- changed his life
- community respect and status

These are functionings that he was able to identify and pursue after acquiring the ICT knowledge. Without the ICT knowledge, he would never have been able to identify these ICT-enabled functionings. Without knowing that ICTs can enable their achievement, he would never have been able to choose to realize them and hence never have improved his life with what the ICTs enabled.

We next sample various functionigns that different people had been able to identify or realize after graduating from the ICT training at SSV.

> I use the IT knowledge for communication [..] I can say that at first I was living in the dark; I could not even see what is happening right outside - I was only seeing what is happening around me, but now after getting the knowledge of ICT, I can now communicate with the outside world and see things happening - I can see beyond what I was seeing before. I also use social networking like twitter. I also use the knowledge to search for and get e-books on the Internet (Informant 6)

> I use IT knowledge for research: sometimes we are given assignments and sometimes it is necessary to get to the Internet to get the information I require to do the assignment. ... [I also] use the ICT during revisions. At other times when I get something new on the Internet I get a group and we

> try and solve the problem together. Also it has connected me with the outside world - I can see what is happening on this side but also on the other side. I am learning not just from Kenya but also from other parts. (Informant 6)
> First it helps me in socializing, cause I have a lot of friends in Facebook, I have some in Twitter, Linked List, Google and also in Skype. So it helps to communicate with people. It also helps me to develop other things, for example, I remember when I was going back to school in the term that is ending, I had a little bit of problem with school fees. I managed to make some cards on my own, printed them out and gave them to some people and they helped me through those cards and so I did not have to hire somebody to develop cards for me; I did it for myself. (Informant 6)
>
> Because of that ICT knowledge, the amount I get from that place [my working place], I can buy what I need. My ICT knowledge enabled me get a job and what I earn from the job I use it in my life. (Informant 5)
>
> Another great package that I use almost every day is this Internet. ... you are able to get any information that you need. For example if you did not understand something in class, you can go to the Internet and get all the information that you want. ... We can also use the Internet to communicate with others, (Informant 1)
> Due to the Social networks like Facebook, Twitter, Email - I'm able to send email to a friend, ... now I can send a text to my friend through the Internet, then through Facebook I'm able to chat with someone who is out of the country, like now I have friends in the US, in Germany and I get to know how life is like there and this has given me the opportunity to connect with people from different areas, different cultures, and it's also helping me to chat with people from different cultures, different areas. (informant 4)

Many other graduates had a lot to say about the things that they have been able to accomplish with their ICT Knowledge. Others expressed some of the things that ICTs can enable them to accomplish. These people have only come to realize the various things that they can do with the ICTs after acquiring the ICT knowledge. It is apparent that these are things that they value, (and can be used to improve their well being), but they could not be able to achieve them before they acquired the ICT knowledge. This list of potential functionings that ICTs can enable includes:

Communication;

Information access;

Learning;

Socializing;
Getting finances

We learn from the informants that they have been able to pursue these things and more and this has improved their lives in different ways. From this we can observe that once a person identifies potential functionings that ICTs can enable, then they can then decide to pursue those that they find valuable.

As one looks at the list of functionings that these informants either achieved or viewed as potential, an interesting observation can be made. Since they came from poor rural communities, many of these trainees were poor and had different capability deprivations. One would expect that they would primarily pursue basic capabilities or at least prioritize the deprived basic capabilities. This seems not to be the case however – the capabilities are mixed – there are both basic and non-basic capabilities (See Table 5.4). This is an interesting finding as it brings out the fact that though basic capabilities are important to the poor, they are not the only important capabilities. Further, this confirms what many studies have confirmed: the valued capabilities will be both basic and non-basic and the basic will not necessarily be prioritized (Alkire, 2002; Krishna, 2005; Narayan et al, 2000a,b; Clark and Qizilbash, 2007). Alkire (2002) further states that for full flourishing, the poor will need the full range of valued capabilities – not just basic. From table 5.4, it is instructive to note that the list of non-basic capabilities is longer than the one on basic capabilities. This also brings out the importance of value and hence the agency of the recipient community. This confirms the fact that participation of the community in identifying capabilities that are valuable to them is critical. This also brings out the importance of people having negative freedom to enable them reject what may well look important but they do not value it.

Table 5.4: Potential Capabilities Enabled by ICTs at Case 1 and Case 2

	Basic Functionings	**Non-basic Functionings**
	Food	Community Respect
	Shelter	Social Courage
	Education	Self-dependence
	Health services	Communication

	Work	Socializing
		Information Access
		Pride
		Improved social status
		Community Assistance

As we look at the list of potential capabilities that ICTs could enable and observe the person that identified particular capabilities, one can observe that the characteristics of the informant influenced the capability they identified (see Table 5.4). Bureau Owner and Civil Servant 1 identified that they used the knowledge to establish an ICT bureau, and used the improved income from the business to accomplish certain ends like building a house or educating siblings. Informant 1 and Informant 4 are both students at Maseno university and they identified learning and improved income in college as valued functionings they got from the ICTs. Informant 3, a male in his forties working as an electrical fitter in the informal sector identified communication, information access and record keeping for business purpose as valuable functionings. Office Assistant and Informant 2, both post-secondary school young men in their early twenties identified improved status, community respect and sense of pride as valuable capabilities. The two informants that used the financial proceeds from their ICT-related work to put up houses (Bureau owner and Bureau trainer) were both young men. One said that the house he built had a cultural significance being the first house he had put up. According to the culture of the community where the research was carried out, the first house a man puts up is very significant. The father has to identify where it will be put up and upon completion the man will not occupy until certain cultural rites are carried out and the 'young man' moves to start his own home and from that point on the community acknowledges that he has his own home. These cultural practices are part of the social norms, discourses and paradigms in the community. According to the capability approach they will influence the conversion of resources to valued functionings as they influence 'what people have reason to value.' The functioning here is not limited to shelter but may also be 'community respect/pride/acceptance.' For this reason, the building of the cultural 'Simba' or is not something a woman in the community will go for. It is clear from the table that persons with similar characteristics end up identifying similar

potential functionings. This means that the same ICTs are converted to different valued functionings depending on the personal characteristics. The personal factors therefore play a big role in determining the capability that one can convert from the ICTs.

Table 5.5: ICT-Enabled Potential Functioning versus Personal factors.

ICT-Enabled Potential Capability	Identified by:	Age of Person	Gender of Person	Education Level	Station in Life
Shelter	Bureau Owner	Mid 20s	Male	High School	Self Employed
	Bureau Trainer	Mid 20s	Male	High School	Working at an ICT Bureau
Learning	Informant 1	Early 20s	Male	University	Student
	Informant 4	Early 20s	Female	University	Student
	Informant 6	Early 20s	Male	University	Student
Community Respect	Office Assistant	Early 20s	Male	High School	Working at a Legal Firm
	Informant 2	Early 20s	Male	High School	Volunteering at SSV
Communication	Informant 1	Early 20s	Male	University	Student
	Informant 2	Early 20s	Male	High school	Volunteering at SSV
	Informant 3	Mid 40s	Male	Primary School	Self Employed
	Informant 4	Early 20s	Female	University	Student
	Informant 6	Early 20s	Male	University	Student

Reflecting on these empirical finding on the potential capabilities enabled by ICTs to the members of these poor communities brings to mind other theories that look at what human beings value to do and to be. We begin by looking at the dimensions of human flourishing that Alkire (2002) proposes from Finnis' basic reason for action, as dimensions of poverty reduction (see section 2.5.4.2). Each of the potential capabilities can be placed within this list of human flourishing. In table 5.3, the basic capabilities of food, shelter and health services are part of the dimension of 'life itself and its transmission.' Education is part of 'knowledge and aesthetic experience' dimension, while work is part of the dimension of 'degree of excellence in work and play.'

On the non-basic capabilities, as we look at the capabilities of Community Respect, Social Courage, Communication, and Socializing, they all have to do with aspects of the dimension of 'friendship'. Information Access has to do with 'knowledge and aesthetic experience', while self-dependence and pride can be associated with 'self-integration.'

Another theory we consider is Maslow's hierarchy of need (Maslow, 1943). One important aspect of this theory is that man is motivated by different needs. The human being goes through a hierarchy of needs from the lowest to the highest. When one's need is met at any level, other higher needs emerge. At the lowest level we have physiological needs (e.g. water, food, shelter), while the highest level is self actualization. As we consider the list of potential capabilities with Maslow's hierarchies, some interesting insights emerge. It is instructive to first note that these potential capabilities were gotten from different people, at different age groups and vocations. Further, these informants all came from a poor community and many enrolled for the training when they were poor (though not all) and had to use their new-found knowledge to enable them get a livelihood. From observation of the people, their livelihoods, and the whole community, it is evident that poverty is a challenge, and many are trapped in it. A number of the informants were clearly not affluent, much as many had used the acquired ICT knowledge to enable them get employment and business that enabled them achieve their basic capabilities. Each of the capabilities unearthed can be placed within Maslow's list of needs. Whereas due to the relatively poor nature of the community we would have expected them to value capabilities closer to the lower levels (physiological and safety), it is instructive to find that the actual potential found can be placed right across the hierarchy from the physiological at the bottom (food, shelter) to the next level of safety (health), right through the level of 'belonging/love'(Community Respect, Social Courage, Communication, and Socializing), the higher level of cognitive and aesthetic (Education and information access). There were some whose valued capability was at the highest level of self-actualization (self-dependence and pride).

Our empirical findings from the poor community have therefore unearthed a different rendering of the capabilities than Maslow's theory: they do not appear to have followed the 'prescribed' hierarchy. This finding, while it challenges Maslow's hierarchy, agrees with other researchers who have criticized the hierarchy, claiming that after extensive research based on Maslow's theory, they had found little evidence for the ranking of needs or a definite hierarchy (Wahba and Bridwell, 1976). (Hofstede, 1984) also criticized the order of the hierarchy as being ethnocentric.

5.4.2 Establishing that the Functioning Opportunity Enabled by ICTs is Valuable

It is worth reiterating that for the poor members of the community, they would only embrace and opt to use ICTs to enable them achieve certain ends. We thus chose to follow the person from the point where they became aware of the potential in the ICT to enable them achieve some functioning they valued, through to what they utilized them for and how they did it. This was done with a view of tracing the decision-making mechanisms involved in the conversion of the means (in this case the ICTs) into the valued functioning, and what was involved.

Case 1

We trace the journey of the Bureau Owner from the training at UCRC, till he established the ICT bureau he operates at Ugunja. He explains his experience in two bureaus before he started his own business. In the first business – a bureau involved in training, typesetting and networking, he did most of the work but the owner mismanaged the business and it collapsed. This is what he said:

> ...I was working as a computer trainer [..] that business there was …typesetting and networking … the business was doing well, the person was not serious with the business and the business collapsed. …. I then started thinking that I can run a similar business –since I was the one doing the work and it was the owner of the business letting me down, since he used to take all the money and at the end of the month there is no money (Bureau Owner)

He goes on to explain about his experience in the next business which finally catapulted him to starting his own business.

> Where I was working, [..] In the beginning … the business used to get Eight thousand (K Sh. 8,000.00) per day … during exams [..] the business got K. Sh. 130,000.00. …and after all that working you get a salary of two thousand five hundred Shillings a day (K Sh. 2,500.00), with no bonus. …I realized this was exploitation since I was the one doing all the work and I got peanuts while he got all the money. …I decided to save the little I was getting and buy some computers and do the business myself. …That's why I started (Bureau Owner).

Here we follow this person in the process of starting his own business. The first business where he worked was doing well and making money but the owner mismanaged it and it

collapsed. While working there he honed his skills since he is the one who did most of the work. In the process of working he realized the good returns the business was making, realized he had what it takes to run the business and decided he will want to own a similar business some day. Where he was next employed, the business was doing very well and they had a lot of income. The large volume of work forced him to work extra hours but he got a small salary with no bonus and this made him feel exploited. The realization that for all the work he was doing he would get a very low salary even though the business was making huge returns made him decide to start his own business. He then began to save for purchasing computers to start his own business. The business he finally started is similar to the two businesses where he worked before and clearly his decision was informed by the money he anticipated to make from the business.

Considering the categories of our analysis, this person becomes aware of the existence of the choice(s) available (the potential that the ICTs can enable). This person had gone through the training and acquired the knowledge and ability to use ICTs. For him to work and later realize the potential that the ICTs availed to him to increase financial resources, he must have had the knowledge and ability. The increased income is not a functioning but he must have seen it as a means to enable him realize/expand some valuable functionings. The choices existing in this case are more than one since the ICTs have the potential to enable the realization of the means (in the form of money in this case) for achieving whichever functioning the person valued. We see that after setting up his bureau, the person gets increased income from the business, with which he was able to achieve a number of useful functionings including among others building a house, educating his brother, food, etc. These are useful functionings which the ICT knowledge enabled him to get. We can see he was ultimately able to convert the ICTs to valuable functionigs but it all started with him becoming aware of the funtionings that could potentially be enabled by (or achieved through) ICTs. It is important to point out the fact these functionings were valuable to him. When he got the awareness of the opportunity which the ICTs enabled, he needed to establish if it is valuable.

To illustrate this further, we consider another graduate who after completing the training went on to start an ICT bureau at Siaya town. On getting training, and acquiring the

knowledge and ability to use ICTs, he realized the potential inherent upon ICTs to enable him get increased income.

> …when I went for the [UCRC ICT] training we learnt a lot; also I developed an interest of becoming an entrepreneur – I decided to buy some computers and open a place, for some people also to learn [..] so where I opened, I installed Internet [connection] and people were coming … and people were very willing to learn and I employed people to carry out basic IT skills training, and some computer services were also being offered, and so I developed an interest of being a business man and in computers (Civil Servant 1)

This person, after training, identified the potential of ICT to start a business. He then made the decision to invest in some computers and set up a bureau. It is clear that even though the potential functionings enabled by ICTs was always there, it was only after undergoing the training that the person became aware of what he could do to exploit the potential in the ICT to realize what he valued.

We next explore the story of another graduate of the basic training who had the following to say.

> When I went there [UCRC] I went there to acquire knowledge of computers so that I can be a bit advanced but when I went there the environment changed abruptly [..] I just felt like, I prayed that I will one day be like my teacher – I was studying but I had a desire that I will be a trainer like my teacher. I thought it's an interesting job and enjoyable, and then you train people for some time and then they get a job and they remember you and you will feel very happy and very proud that even you can do something that people can appreciate (Bureau Trainer).

As he was acquiring ICT skills, he was inspired by the way the trainer was carrying out the training and empowering people to get jobs and use ICT in their lives. He felt that doing this accords the trainer due honor and he decided that he will one day be a trainer as this would give him satisfaction and make him proud. He therefore says he studied hard and looked forward to being a trainer one day and says he was very happy when he finally got a job as a trainer and mentions the satisfaction he gets when he sees the people he has trained use the knowledge in their lives and livelihoods. The person identified the choice available – in this case the potential of the ICTs to enable him become a trainer.

It is clear that apart from existence of the potential functionings that could be achieved through ICTs, it is important that the person becomes aware of this functioning. If this

does not happen, there is no way that this person would pursue the opportunity. For the potential functionings to be achieved through ICTs, awareness of the potential functionings is important. How this awareness happens is important. Information will play a part in this. For Bureau Owner, he became aware through the information he got from the work experience at the two ICT bureaus. His working place was part of his social network. Bureau Trainer became aware of the potential functionings available through his interaction with his trainer. This is also an example of the person's social resource informing his awareness. From the examples above we can see that this awareness will be enabled through information the person will receive. The source of the information will among other sources come through the social network or through their education and knowledge. Finally, value plays an important part in that only what the person has reason to value will make it to that list of potential functioings that the person will pursue. We therefore consider the issue of value.

In Section 2.5.4.4, we reviewed Alkire's (2005) operational interpretation of the capability approach as it relates to capabilities to meet basic needs. We saw that the long term goal was to increase the basic capabilities without contracting the overall capability set. This requires one to:

- to identify valued capability goals and strategies (e.g. using participation);
- to work in the short term to establish functionings instrumental to these goals;
- to use a procedure in the implementation that safeguards negative freedom
- to mitigate the contraction of wider capabilities that occur as a result of expanding basic capabilities (where possible, to allow both to expand)

In our analysis of the cases above, the informants had identified the functioning opportunities and strategy (e.g. increased income by establishing an ICT bureau business). Establishing functionings instrumental to these goals involves the implementation of the bureau and rolling out the services to the public so that he could realize the functioning (increased income). It is important to establish that the informant had agency freedom. Agency freedom was defined as 'what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important' (Sen, 1985, pp 203). Further Sen states that '… this process aspect of freedom concerns personal

process concerns such as autonomy and immunity – whether the person was free to choose herself, whether others intruded or obstructed, and so on' (Sen, 2002 pp10. We therefore needed to know whether the person was coerced or acted unobstructed. Were there negative freedom safe guards? With the agency information, we can say that the person had reason to value this functioning opportunity. In our case, the informants stated clearly that theirs were personal choices that were not constrained or brought to bear upon them from another quarter. We also saw that because human flourishing involves the full range of human capabilities, we need to ensure that the process of realizing basic capabilities does not contract other capabilities that the informant has reason to value (or if they did then some mitigation mechanisms were put in place). There are situations where functionings could be used as a proxy for a capability. These include 'all situations of extreme material and bodily deprivation in very poor societies or communities' (Robeyns, 2005 pp 101) but there a qualification that in that case one could conceptualize 'being able to choose' as one functioning among others' Stewart (1995, p. 92).

Case 2

On being asked whether there were people in the community that have a negative view of ICTs and why they did, Informant 2 had the following to say.

> I think [it is because of their ignorance about ICTs] because I have talked to many as I move from house to house and explained the importance of computers, I've even showed them examples. For instance, there was a person whose cow died and left a calf which was 4 days old. When I got to the home the man explained ... I then told him not to worry or even consult a veterinary doctor. I told him that I would get all the information he needed from the Internet and I used Google to search, and got information on how we can take care of an orphan calf. He used the information to take care of the calf and the calf is now well, can eat grass and is growing. When he saw what happened, he was amazed and wondered, 'You mean there is such useful information on the computer[Internet]? So he got interested and sent all his sons and daughters for the basic ICT training and they have all completed the training (Informant 2).

From the experience of this informant with the farmer, we learn the importance of awareness – of the potential of ICTs to enable valued functionings – in influencing

people's decision to acquire ICTs knowledge. Because of the ICT knowledge he possessed, Informant 2 was aware that he could search for and get this important information through the Internet which could help the farmer's orphaned calf. We see that the demonstration of the role of ICTs as means to expand a livelihood (valuable functioning) can affect a person's decision on acquiring ICTs Knowledge. In the case at hand, when the farmer realized that the knowledge that helped him take care of the orphaned calf came from the Internet, he gets amazed and this seems to influence his decision to send his children for the ICTs training. This leads us to observe that the awareness of the potential of ICTs to positively influence the livelihood (that is as a means to enable livelihoods or functionings) can lead to its acquisition and use.

The awareness/knowledge of the potential that ICTs have can open up functionings choices or livelihood choices. The person below reports what has changed in his life after he got basic ICT training.

> Before I learned [ICTs], I was just illiterate [..] now it has given me so many choices, for example, through it I can get some money, through the knowledge establish some business, improve farming skills, I can be able to learn online (Informant 2).

From the example above the knowledge has opened for him many choices to do valued things or improve his wellbeing. Clearly ICTs knowledge will affect the potential valuable functioning choices and therefore affect the decision to acquire and use the ICTs as a means to achieve the functionings. He says that before he got the ICTs knowledge, he was illiterate on the many choices that he could achieve with them. The knowledge made him aware of what he can now achieve and with this he could decide to pursue the choices that he would consider valuable.

We also look at other options that open up for the people that received the ICT knowledge from the training. One of them explains that after he underwent the training, he got many new options that he could do.

> I can do many things which I was not able to do before. Because of this IT knowledge, there are things which I'm able to do that my age mates and even people older than me that do not have the knowledge cannot do (Informant 6).

It is clear that exposure to the ICT training and knowledge gave the person new options they did not have before. It also emerges that ICT knowledge enables one to do things that people without it are not able to do.

We have already observed the importance of ICT awareness in the process of converting ICTs to valued functionings. The awareness that we are discussing here comes as a result of getting sufficient ICT knowledge.

> I started taking computer lessons when I was in [secondary] school but I did not finish, so after school I joined SSV, completed my training in late August, then after about two months I was employed in Berraca, and that's when I realized I can do a lot with ICTs (informant 5).

We can therefore observe that to appreciate the full potential of the ICT-enabled functionings, one requires to have ICT knowledge through training. The pattern that is emerging is one where people who are knowledgeable in ICTs will understand/appreciate the potential in ICTs.

This awareness of the potential functionings that ICTs can enable one to achieve is made possible through a number or things. One of them is training or knowledge acquisition. We could say that it is through ICT education that one becomes aware of the functionings. Where one has prior training in ICTs and they have the ICTs knowledge, this knowledge will be important in determining the valued capabilities that ICTs can enable. It also emerges that the awareness can also come through the social resources one has. Another reason from the above is information or knowledge. Bureau Owner tells how he learned of the potential to use ICTs to start and run a bureau to make money through the work place. This knowledge/information came through the social environment. We can thus say that for awareness, some resources are required, including information, education and social capital. It is also apparent that personal factors like cognitive factors will play a part in this awareness. Other personal factors like age, gender and ethnicity will also play a part. There will be some functionings that a person will not identify and be aware of if they are a certain age or if they come from a certain community. The capabilities one values are important as they will inform the awareness of valued ICT-enabled capabilities. This is because for one to pursue a functioning opportunity, they must have reason to value it. For them to establish that the opportunity availed by the ICTs is valuable, the must have agency freedom.

It is important to establish that the informant possessed agency freedom. Agency freedom was defined as 'what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important' (Sen 1985, pp 203). Further Sen states that '… this process aspect of freedom concerns personal process concerns such as autonomy and immunity – whether the person was free to choose herself, whether others intruded or obstructed, and so on' (Sen, 2002 pp10. We therefore needed to know whether the person was coerced or acted unobstructed. Were negative freedom there safeguards? With this agency information, we can say that the person had reason to value this functioning opportunity. This is important unless there is coercion, the person will not pursue the functioning if it is not valuable. To therefore establish that the person had reason the value the opportunity there needed to be negative freedom for that will indeed show that they possessed agency freedom.

To summarize therefore, after one gets the awareness of the opportunities available, they must have reason to value them if they will indeed pursue them. If they do not get aware of the functioning opportunity, they may never pursue it but upon awareness, they must establish that it is valuable. According to the capability approach, if one does not have a reason to value a functioning, then even though it is considered good by others, if it is forced on them then it is not a valued functioning and hence is not part of their capability set an hence no conversion has taken palace. We illustrate the above with Figure 5.12, where we illustrate the forces that enable this awareness of the potential functioning and the reason to value.

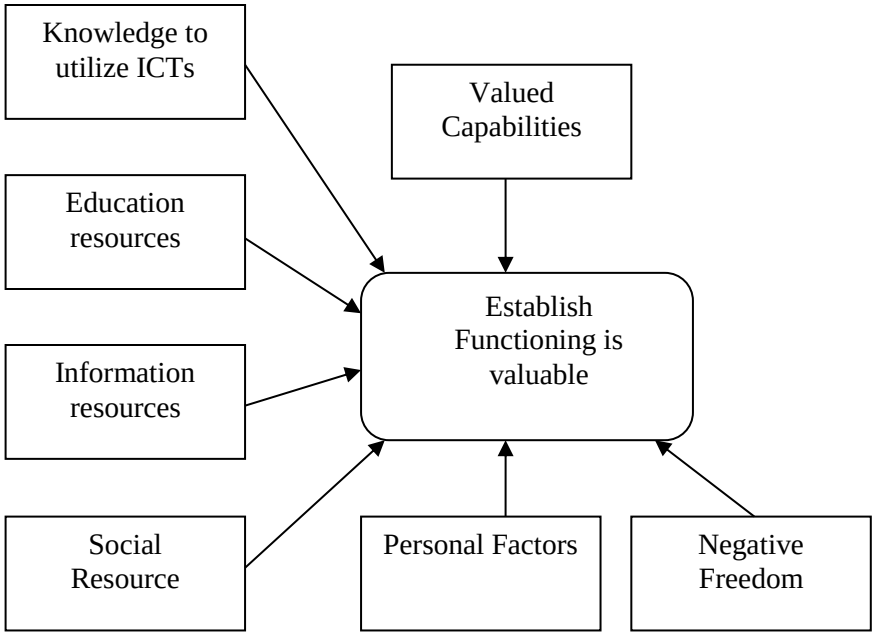


Figure 5.12: Establishing ICTs-enabled functioning is valuable (Source: Research)

5.4.3 Ability to Achieve ICT-enabled Functioning

We reiterate that capability is the freedom to pursue functionings that one values and has reason to value. CA advises that this freedom should not be theoretical or just legal while in reality it lies beyond the reach of the person – it is thus "the real opportunity that we have to accomplish what we value"(Sen, 1992:31, 2001:74). The person should be able to pursue and achieve what they choose irrespective of who controls aspects of the means (Sen, 1992:65). This means that the valued choices must in reality exist, the people must be aware that they exist and they must have the ability to accomplish what they value and have reason to value. In thinking about this ability, they must have reason to value it. This is important because there are times when community ICT interventions are implemented without involving the community. For the two cases we studied, the conception and choice of the interventions did not closely involve the community. As they become aware of the potential functionings available, do they have reason to value them? The question of agency and negative freedom therefore become important, as we consider whether they will be able to choose and pursue what they value. In our case,

apart from availing the ICTs and ensuring the people get the knowledge, they must have the ability to choose to pursue and achieve the potential functioning enabled by the ICTs. Once the ICT-enabled potential exists, the person has the knowledge and a person identifies and becomes aware, they must be able to pursue it (they must have the real freedom) for us to say that they have the capability. The question then is, "If a person identifies what they can potentially get through the ICTs, are they in reality able to pursue it?" We revisit a number of scenarios we have encountered before to illustrate this.

In the case of Bureau Owner that came across in Section 5.4.2, after working for the 2 bureaus, he realized that his need of higher incomes could be achieved through ICTs. He became aware that he could set up an ICT bureau that would enable him get the income he needed. The next thing was to establish whether he was able to choose to pursue the venture. He needed to ask himself whether he had what it takes. Did he have the knowledge and skill required? Did he have the resources required? Could he access the resources required? For him, did he have the knowledge and skill to set up and run a bureau (could he provide the services needed)? Did he have the required computers for the bureau? Did he have the space to set up the bureau? Was he able to fulfill any necessary legal or institutional requirements (e.g. licenses, certification)? If the answer to any of these questions is no then he cannot set up the bureau and achieve what he needs to. In that case the freedom will only be theoretical. If he has all these requirements, then we can say that he has the potential to do what he wanted to (the functioning of being able to get higher income). Another way of looking at this is that he has the opportunity to realize the functioning, or he has a valuable option (functioning) from which to choose.

We next consider the case of an informant at SSV who recounts how he used the Internet to get information that enabled him to plant a variety of beans which benefitted his family. We briefly consider the process he went through below:

> After I got basic computer literacy, I sat down and thought, 'Why am I doing this course? Am I doing it just because I need a certificate? What will I do with the certificate? ... "What do I do? (Informant 2)
>
> ... Because even my mother was complaining because I could go to the shamba, and after one hour I would leave and as I left she would tell me, "You are just wasting time. Where are you going?" And I would tell her,

> "I'm going for the computer lessons." After that I thought, "What can I do to show my mum that I got something? What can I do?" (informant 2).

With the desire to demonstrate to the mother that the new knowledge was valuable, he began to reflect on what to do. He took time to evaluate different livelihood possibilities of value to the family that.

> Then I thought, "The way she is working so hard at the shamba[10], let me do something in the farm to show that I got something from the computer..(Informant 2)

He finally settled on the agricultural livelihood that was familiar and would clearly be valuable to the mother. He selected this and then sought out how ICTs can be used as the means for its attainment.

> It started not long ago when the Local Catholic church was donating some beans to the community. The beans were however very limited. So I inquired from them. "What type of beans are these?" They did not tell me what they were. I then went to the Internet and I "Googled" different types of beans, and I finally managed to identify the particular bean - it had a very strange name. … I then asked my mother, "There is a certain species of beans which if you planted here can do very good." Then she asked, "Where did you get that information?" I told her that we were chatting with my friend through the computer and he told me about it. Then she remarked, "computer is good!"(Informant 2)

He utilized the ICTs knowledge he had acquired (via the Internet) to get information on the beans being donated to the community, and came to the conclusion they could be the candidates to demonstrate how ICTs can be utilized to realize some good for the family (what the family had reason to value). Through the Internet therefore, he saw an opportunity to realize a functioning. After settling on the beans, he got the mother to participate in selecting something that she valued.

By consulting his mother, he gets concurrence on the valued functioning, thereby exposing the beneficiary to the potential of ICTs.

> I identified that this particular variety was being grown in Machakos and even got the name of the shop in Machakos where one could buy the seeds. ... I came home with them and we planted them in our garden at home. Earlier this year she harvested around two and a half sacks of the

[10] Kiswahili for farm

> beans and the people in the community are coming to our home to get the seeds so that they can plant them in their land.]. [Upon seeing the beans harvest] she said, "These are great beans! You really got something good!" (Informant 2)

He gets further information on the beans (livelihood) and goes and buys them and they are planted - all the time the beneficiary (the mum) participating in the decisions being made about the valued functioning and the means that will be applied. This resulted in the beneficiary getting the valued functioning with the ICTs being part of the means to realize the functioning (of course with information resources and material (beans) resources and natural resources (land) and human resources (labour)).

The informant goes through a process where he identifies this new variety of beans as a possible valuable functioning. He uses the Internet to get all the information about the variety, and even where it could be purchased. The information he got must have assured him that the variety could do well in their area. He confers with the mum who confirms that this is indeed valuable. He then makes arrangements and gets the beans, they are planted, grow and are harvested. When the potential got clear to the informant, he had to have access to the Internet to get the required information needed. If any of these were not available then the functioning would never have been achieved. Unavailability of any of the above meant that he did not have the ability to achieve the functioning.

To be able to achieve the functioning, the potential functioning must first be available, the person must be aware that it exists and they must be able to choose it. For 'Bureau Owner', he required the knowledge and experience needed to run a bureau and the resources required. It is also clear that the cognitive factor plays a big role in the identification and selection of the valued functioning and the establishment of whether one has the ability to pursue and achieve it. Similarly for the informant at SSV, they needed the ICT knowledge, the awareness of the potential functioning, access to the information required including Internet connection, and other resources like financial, land and labour.

We next consider the social context for the realization of these valued functionings. In the case of bureau owner, he set up a business where people got services like printing, basic ICT skills training, internet services like email and access to government services. For

bureau owner to start, he bought two desktop computers, a printer and managed to get the Microsoft Office suite onto them. He did not have much in terms of financial resources. Some of the requirements he had included a license for his business, the two computers, a printer, internet access and a room to house the business.

> At first I worked for somebody for 2 years (2009 – 2010) who had a training school, where I was a trainer in computer applications. I decided to save the little I was getting (since I was staying in my brother's house and was not married) and buy two computers and do the business myself. … and then hired this office and started training people in computer applications. In the beginning one of the computers broke down (due possibly to power fluctuations) and I therefore used one computer to offer training services. … I then added other computers, some time towards the end of last year, when the form four students completed their exams.

Because the financial resources available to him were limited, he needed to get access to affordable computers. The governments a few years ago zero-rated the tax for ICT products. This made the computers affordable. The cost of Internet services have on the downward trend in the last number of years. This, coupled with the fact that the mobile service providers have been providing internet services and there has been competition has meant that the price of internet services has become affordable. The internet services coverage has increased over the last few years.

According to Waema and Miroro (2014), Internet Service Providers in Kenya were first licensed in 1999. With the installation of the four undersea fibre-optic cables connecting Kenya to the international Internet backbone, and the building of terrestrial fiber networks and national fiber backbone, the Internet connectivity has improved (Waema and Miroro, 2014; ICTA, 2014). With the improvement in Internet infrastructure, the capacity and quality has improved and the cost of International bandwidth has gone down (Gillwald, 2010). All these development have increased accessibility and affordability of Internet services. Waema et al (2010) report that with the use of the unified license, the mobile operators have become the largest ISPs. This has led to many retail users using the wireless data services provided by the operators for Internet access.

The ability of Bureau owner to establish the ICT bureau depended upon the availability and affordability of ICTs (computers, internet services). These have been influenced by

the institutional and legal context. The policy and legal context has had a big impact on the availability and affordability of the ICTs services. For bureau owner to be able to establish the bureau and hence the means to realizing the functioning of increased income using ICTs, the social, policy, institutional and legal environment had an effect. This could not have been possible a number of years ago. This shows us that the socio-environmental context (social and environmental conversion factors) had an enabling effect on the setting up of the bureau and the achievement of the valued functioning.

For Informant 2, access and affordability of the Internet was important for them to get agricultural information on the bean variety he introduced to his family. For his family to get the functioning (nutritional, and financial) he needed the Internet services and they needed to be affordable. Clearly, the achievement of these functionings was also contingent upon the socio-environmental context (social and environmental conversion factors). All this demonstrates the that the social and environmental factors will affect the conversion of the ICTs into valued functionings. We summarize our findings so far in figure 5.13.

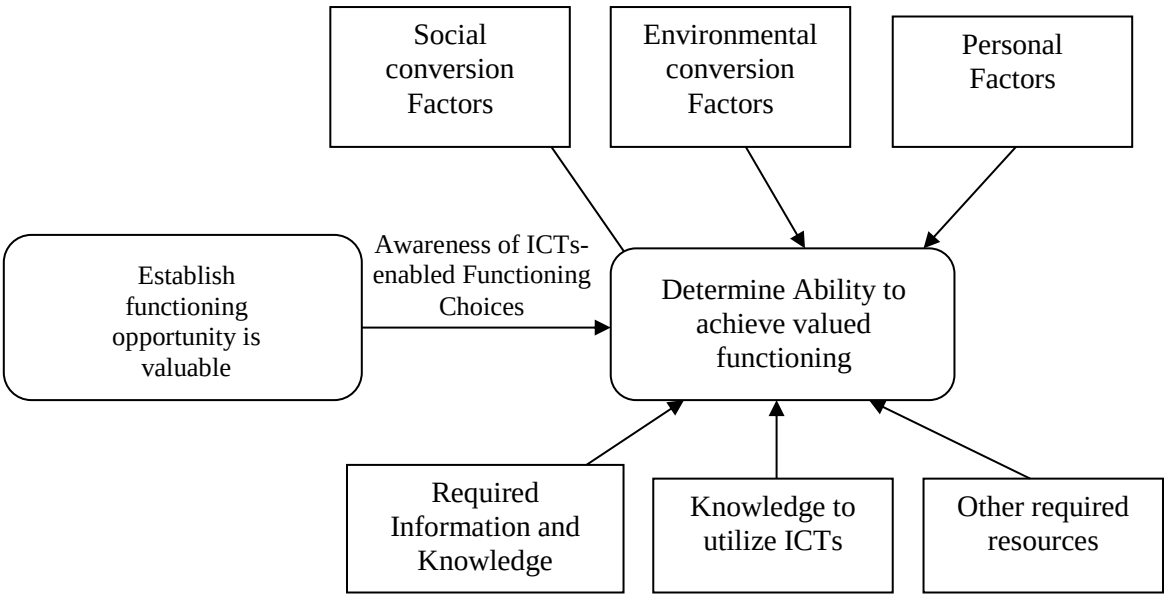


Figure 5.13: Determine ability to achieve functioning (Source: Research)

5.4.4 Decision on use of ICTs

In Section 5.4.3, we looked at the ability to achieve the valued functioning. We saw that for one to have the freedom to achieve the valued functioning, they must first be aware of the functioning and then they must then have the ability to choose. They must therefore first determine if they are able to realize the functioning before they will pursue it. We can say that those for whom the potential functioning exists (enabled through their knowledge of ICTs), and they have the awareness of its existence, and they have the ability to realize the functioning, the vector of functioning exists for them to do what they want. In other words they can realize the functioning opportunity. For a poor person, we can say that they have the freedom to achieve the basic functioning they are deprived of. When a person has the freedom, they can make the choice to pursue and achieve the functioning or they could choose not to. This is a decision they have to make. Those who choose to pursue it will ultimately achieve it and we say they will have achieved the functioning.

The emerging themes are summarized in Table 5.4. In the table we capture the area of inquiry and the emerging themes. These are the themes that came out of the analysis and discussion of the findings.

Table 5.6: Research Question 3 Emerging Concepts

Area of Study	Emerging Concept
Potential of ICTs to Expand Valuable Functionings	I. People identified many fuctionings that ICTs could enable II. Personal factors seemed to affect the potential ICT-enabled functioning a particular individual identified. III. The identified functionings were both basic and non-basic and none was prioritized over the other
Awareness of Existing Potential Valuable Functioning Choices Enabled by ICTs	I. For one to pursue a valued functioning they must first be aware that ICTs can enable its achievement. II. Awareness is enabled by information, education and social resources III. Awareness is also enabled by personal factors including literacy and mental. IV. Value plays a big role in the awareness
Ability to Make Choices that Lead to ICT-enabled Functionings	I. To achieve a functioning, a person must have the ability to pursue it II. The ability to pursue is incumbent upon the person having the awareness of the functioning III. The ability to choose will depend on the ICT knowledge, required knowledge, and required resources IV. The ability to choose will also depend on personal factors, social factors and environmental factors.
Decision on adoption and	I. When a person has the ability to do the choosing, they can either

use of ICT	choose to achieve the functioning or decline. II. Choosing to accomplish the functioning will lead to the achievement.

5.5 Analysis Summary

This research set out to investigate the process of conversion of ICTs to valued capabilities as a way of theoretical contribution to poverty reduction using ICTs. We have so far looked at how resources and ICTs affect each other during the conversion of ICTs to valued capabilities. We have also explored how conversion factors interact with ICTs and other resources and even with each other during the conversion process. Different forces and their interaction have been identified. We have identified that when an ICT intervention is introduced to a community, the conversion process goes through a three-stage process. There is first the decision to acquire the knowledge to utilize ICTs, and once the knowledge is acquired the awareness of the ICT-enabled valued functioning, and the determination whether one had the ability to use the acquired knowledge achieve the valued functioning. During these three processes there are myriad interactions between ICTs, resources and conversion factors. We started with a framework that captured the main forces and used it to study the conversion process. After the study a number of findings came out. This includes the role of personal conversion factors in enabling access to ICTs, the role of social factors and resources in influencing the attitude of the people towards ICTs. This attitude played a big role in determining a person's decision to acquire ICTs knowledge. This decision is also affected by Access to ICTs. The people without access to ICTs will not be in a position to decide to acquire the knowledge. Those who do not make the decision will not be able to acquire the knowledge to use the ICTs and may find themselves unable to convert them to valued capabilities. We also saw that the decision to acquire the knowledge will be affected by one's valued capabilities. If the person perceives that the capabilities they value cannot be realized using ICTs or that the capabilities that are enabled by ICTs are not among the

capabilities one values, the person will not choose to acquire the knowledge. One's valued capabilities are therefore key to the decision to acquire the ICTs knowledge.
Different views of the adoption and conversion process were integrated with a view of coming up with a framework on conversion. This integration is briefly explained below.

From the results of Question 1 and 2, it became clear that before conversion, there is need to acquire ICTs knowledge. We considered this process, the factors and resources involved and integrated various aspects from Figures 5.1, 5.2, 5.3, 5.6, 5.7, 5.8, 5.9 , 5.10, 5.11, 5.12 and 5.13 and came up with an integrated framework that captured the different aspects during the acquisition of ICT knowledge. This integrated framework is captured in Figure 5.14. In the framework, we identified the role of personal factors, and resources in affecting access to ICTs. The roles of resources and social factors in influencing people's attitude to ICTs were also captured. The framework also brought out what may affect attitude towards ICTs.
When a decision is made to acquire ICTs knowledge, one will potentially be able to use the ICTs to achieve their functioning. For them to be able to convert the ICTs to capabilities, we saw that a number of things need to be in place. With the intervention, the ICTs potentially enable certain functionings. We saw that the people need to have awareness of valued ICT-enabled functionings if they are to decide to use the ICTs to achieve them. This awareness is influenced by personal factors, resources and ICTs Knowledge. One will only be able to know the potential of ICTs to enable certain capabilities if they have ICTs knowledge. The capability one values will also inform this awareness since only one's valued capabilities will be considered as candidates for conversion. When the people have the awareness, they need to establish whether they have the ability to use the ICTs to achieve their desired functioning. The ability is affected by personal and social factors, ICT knowledge and some resources. Once the person establishes that they have the ability to realize the functioning, we can say that they truly have the freedom to achieve their valued functioning. At this point once can say that conversion has taken place and they have the freedom to achieve. One can say that the person has the freedom to achieve their valued functionings (what they value to be and do). We capture this process and the forces involved in Figure 5.16 below. Once

they have the freedom, they can now choose to pursue its achievement and once they make the decision then they will get the achievement. This brings us to the end of the inquiry into the conversion of ICTs to capabilities.

We combine the two aspects and come up with figure 5.16 below. In it all the forces and interactions are brought out. From the figure, it clear that conversion involves the decision to acquire knowledge on ICTs, use, becoming aware of the ICT-enabled valued functioning, and determination of the ability to achieve the functioning they have reason to value. Once all these are in place, we can say that one has the freedom to achieve the functionings because the potential functionings exist, they are aware of them and they are able to achieve the functioning. At that point therefore we can say that they have the freedom to achieve the functioning and it is up to them to decide to achieve and once the decision is made then they can achieve the functioning. The figure clearly captures all the forces that affect the process of conversion. This brings our quest to map the conversion process to an end. For clarity of understanding the figure, we opted to represent the different aspects differently. The conversion factors were represented as rectangles. The resources are represented as octagons (style adopted from Klein (2009)), while decision-making processes by the agent are represented as rounded rectangles.

Goods and services (resources) are important only in the light that their characteristics can enable people to be and to do what they have reason to value (i.e. in the light of the capabilities that people can generate from them (Robeyns, 2005). From Figure 2.2, we see that generating capabilities from resources is enabled by the conversion factors (Zheng, 2007). These factors could either enable or constrain the conversion. Zheng adds that using technologies like ICTs influences social and personal characteristics thereby affecting conversion factors, and decision-making mechanisms. Our research has empirically traced how the introduction of basic ICTs skills training affects the conversion factors and other resources and how they influence the decision to acquire the ICTs knowledge and how the knowledge is converted to a capability. We have especially identified the decision-making mechanism and the place of the various factors and resources. In Section 2.5.5.5, we reviewed Alkire's operationalization of CA for poverty reduction (Alkire, 2002). In our research, even though the introduction of basic ICTs skills training did not initially involve the community, the training is such that it is the

individual persons who determines what they will do with the knowledge acquired. They therefore determine what their valued capabilities are and the strategies to realize them. The question of working in the short-term to establish functionings instrumental to the identified capability goals and strategies again in left to the individual. The decision whether to acquire ICTs knowledge and the determination whether the potential ICT-enabled functioning is valuable and whether they are able to use the knowledge to achieve their identified functioning is also left to the individual. This means that the people fully participate in deciding whether to use the ICTs, what to utilize them for, and that they have negative freedom. This therefore can potentially be utilized by poor individuals/households to achieve their deprived valuable capabilities therefore reducing poverty.

Upon consideration of the final framework on conversion, we opted for an abstraction where the factors are put together and the resources are also put together in order to follow the process. This brings us to figure 5.17 which illustrates how the factors and the resources interact during the conversion. The place of agency is identified because at three stages one has to make a decision to realize the goal; the decision to get the knowledge, determining whether the ICT-enabled functioning is valuable and lastly whether one has the ability to achieve the functioning. At each of these places there is exercising of agency. At the stage where establishes if the ICTs-enabled functioning opportunity is valuable, there is need to establish that there are negative freedom safeguards.

As we further interrogate the framework, it is apparent that there are parallels with the Sustainable Livelihoods framework. Upon achievement, the functioning may be an increase in resources or a means to getting resources. Achievement can therefore enable on to increase their resources. There is therefore a feedback loop from achievement to resources just like the SLA. The way the human agent utilizes the resources within the social environment and the bearing of the social factors on the resources also comes out. The interaction of personal factors with other factors as the agent works with resources also comes out. One can therefore trace the agency of the actor as the person moves to realize the functionings. One can also discern the parallel between the livelihood

strategies with the functioining opportunities. In our model, the opportunities involve agency and decisions on acquiring the knowledge, establishing functioning opportunity is valuable, and determining ability to achieve. This can be compared with the person getting livelihood strategies, given the resources available to them .Our model did not address the vulnerability context but perhaps we can argue our model addresses the issue of coming up with livelihood strategies given the resources and the structure and process. It is important to mention that SLA anticipates the achievement a priori but if there can be community participation in determining the ones they have reason to value, then it can be to come up with strategies that could involve ICTs to realize the functionings.

We then compared the final model (Figures 5.16 and 5.17) from our research findings with the conceptual model that was utilized to inform the study (Figure 2.4). As we compare the models, it is apparent there are parallel. The resources have been found to have an influence on the conversion factors. The conversion factors will have an effect on resources because they an determine the accessibility and affordability of resources and this will affect conversion. The arrow between resources and conversion factors will therefore be bidirectional. Conversion factors will affect the opportunities that are possible given the resource portfolio a person has. There is thus an arrow from the conversion factors to the three stages of conversion. Lastly, there will be an arrow from the resources to the conversion stages. Finally, one's set of valuable functioings will determine the whether one has reason to value the opportunity that the ICTs can enable. When one establishes that the functioning opportunity is valuable and they determine that hey have the ability to achieve, then they will have the freedom to achieve the functioning and this will be added to their vector of functionings. This therefore means that there is a bidirectional arrow between the conversions stages and the valued capabilities. Finally, for conversion, one will need to have (or acquire) ICTs knowledge. On acquiring the knowledge (e.g. through training), there will be availability of knowledge and therefore the arrow to ICTs knowledge is bidirectional (see Figure 5.18).

When one chooses to pursue the opportunity and achieves it, the achieved functioning may result in increased resources. There is thus a feedback loop from achieved functionings to the resources.

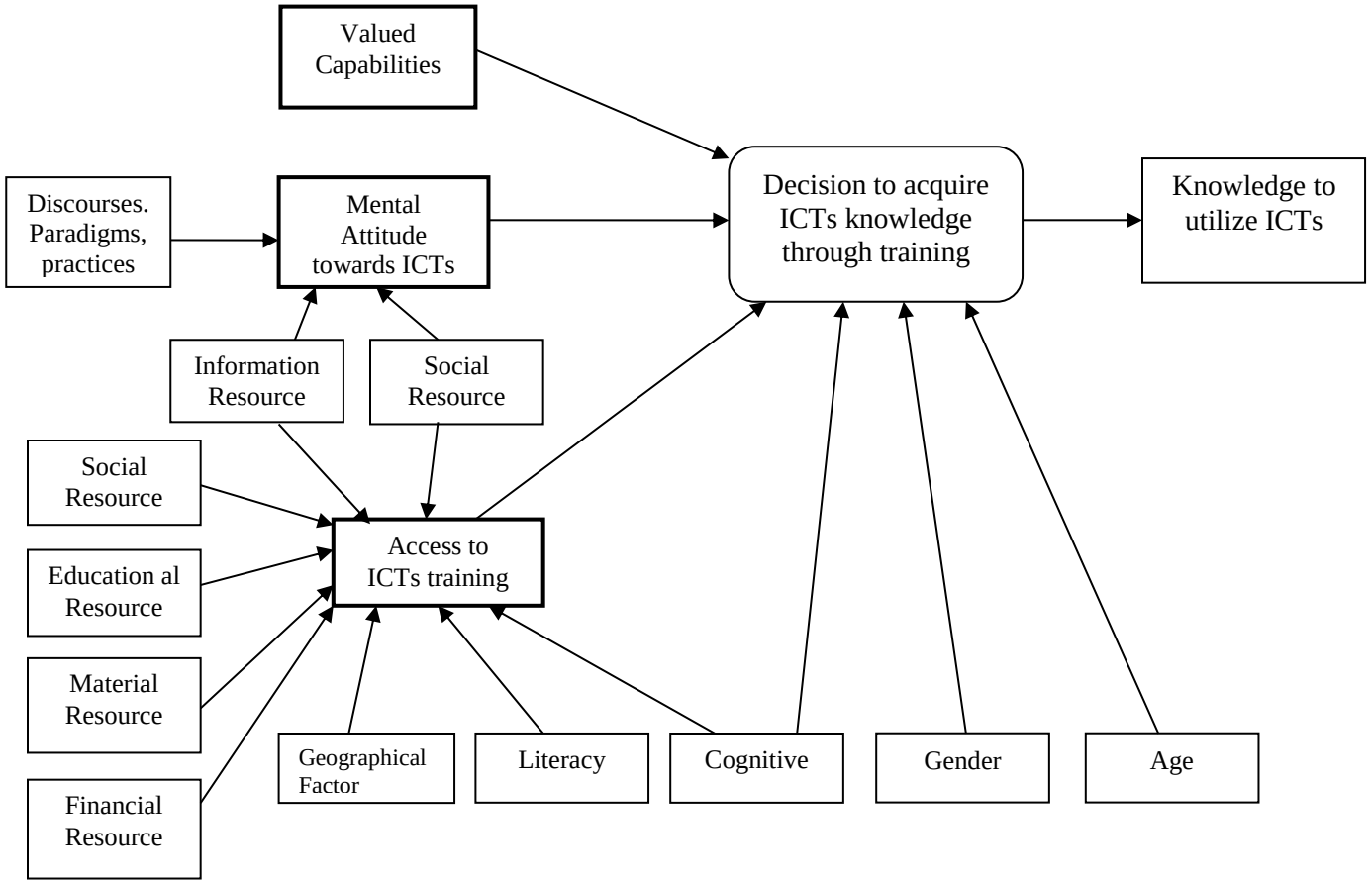


Figure 5.14: Decision to acquire ICTs knowledge (Source: Research)

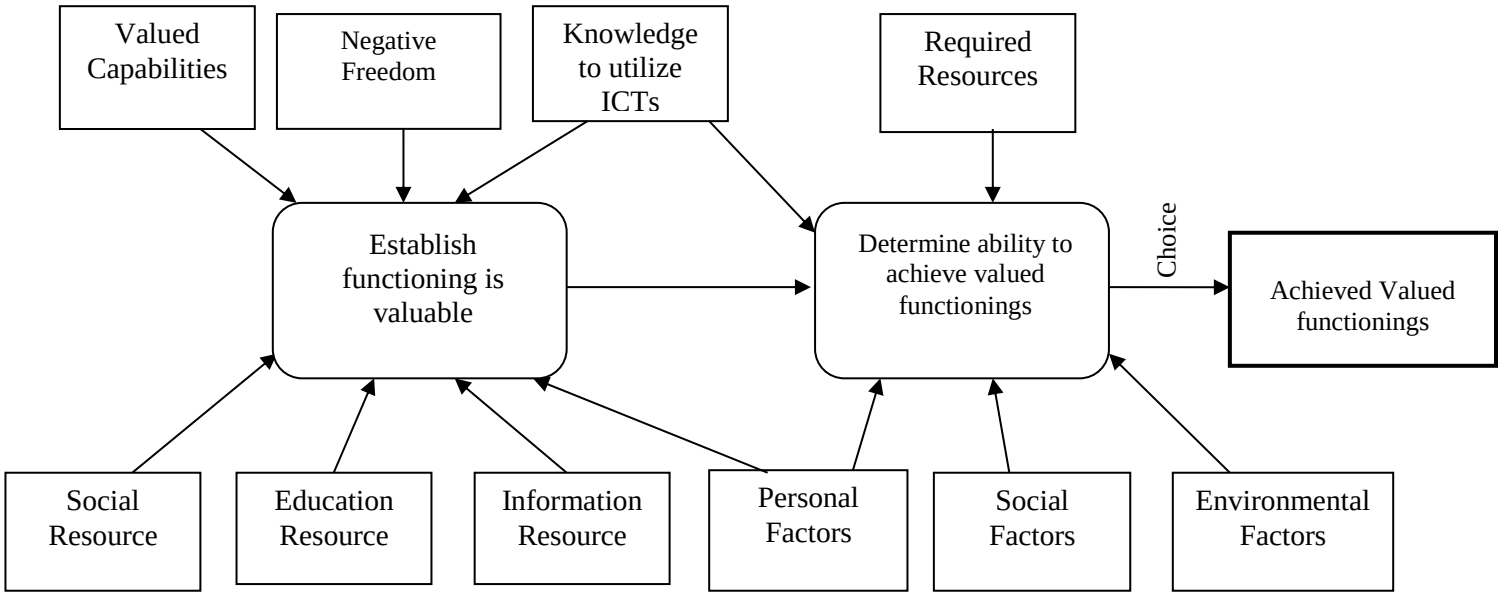


Figure 5.15: Conversion to capabilities (Source: Research)

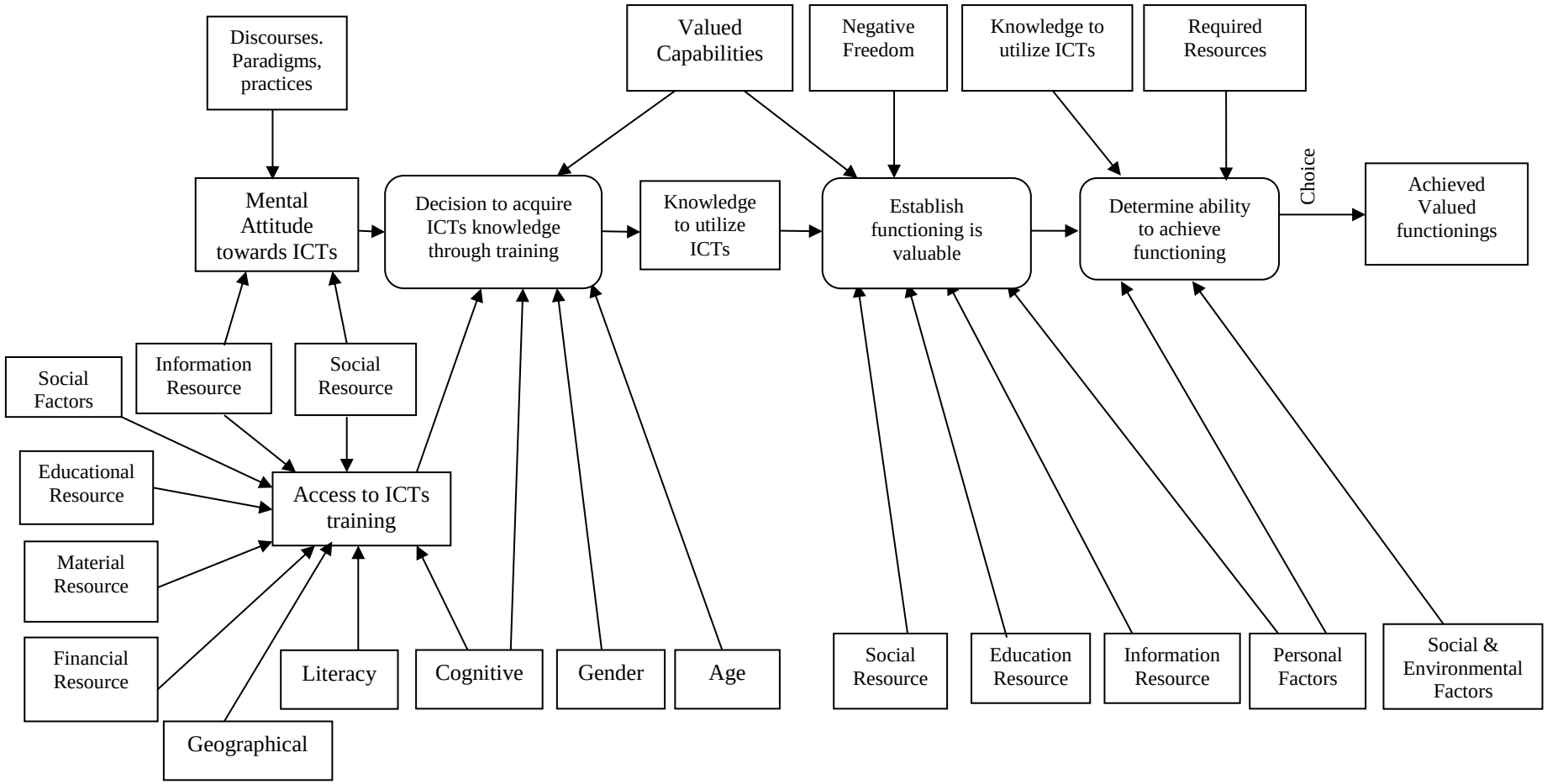


Figure 5.16 Conversion of Means to Capabilities

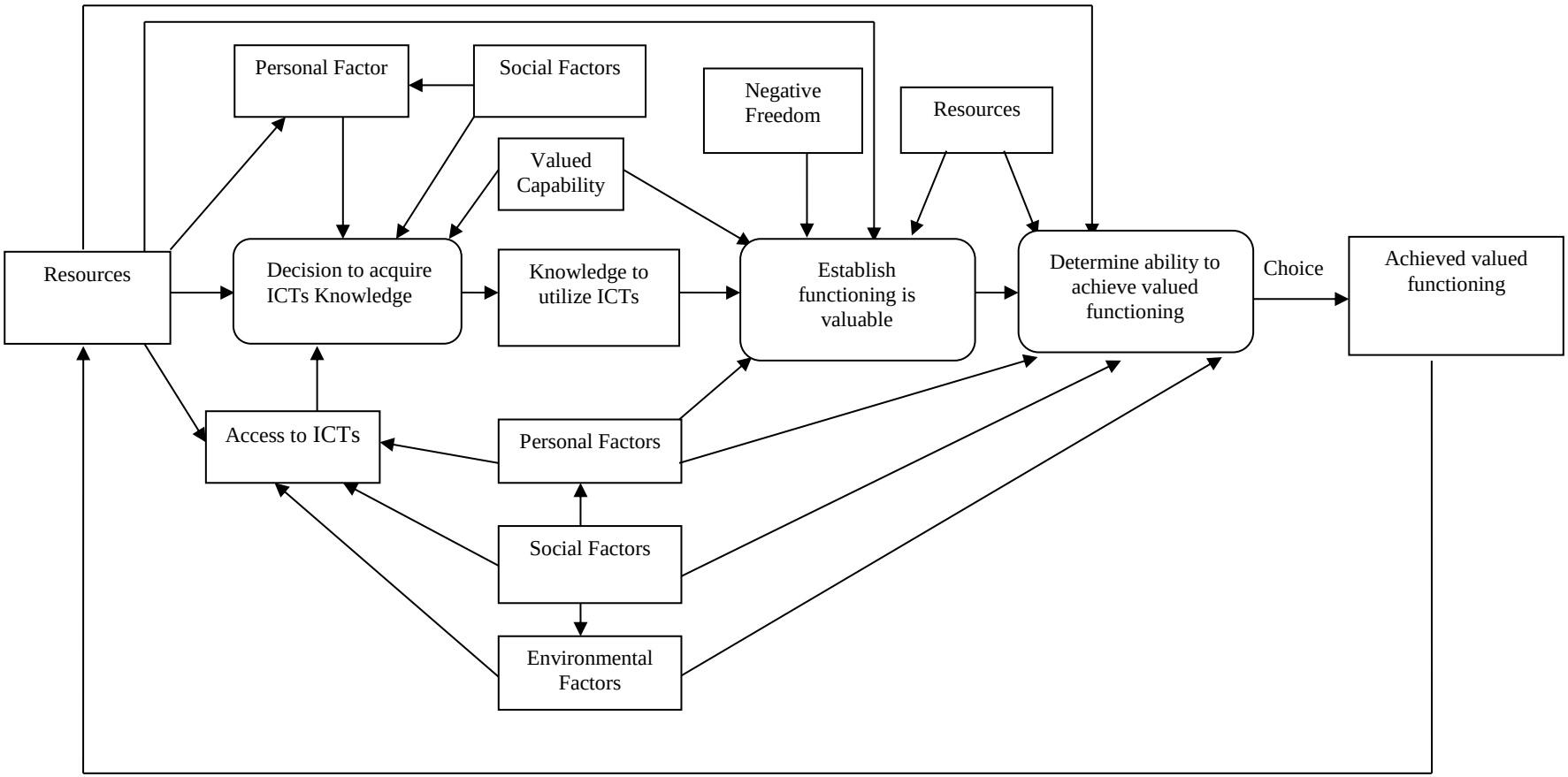


Figure 5.17: Means to capabilities (Source: Research)

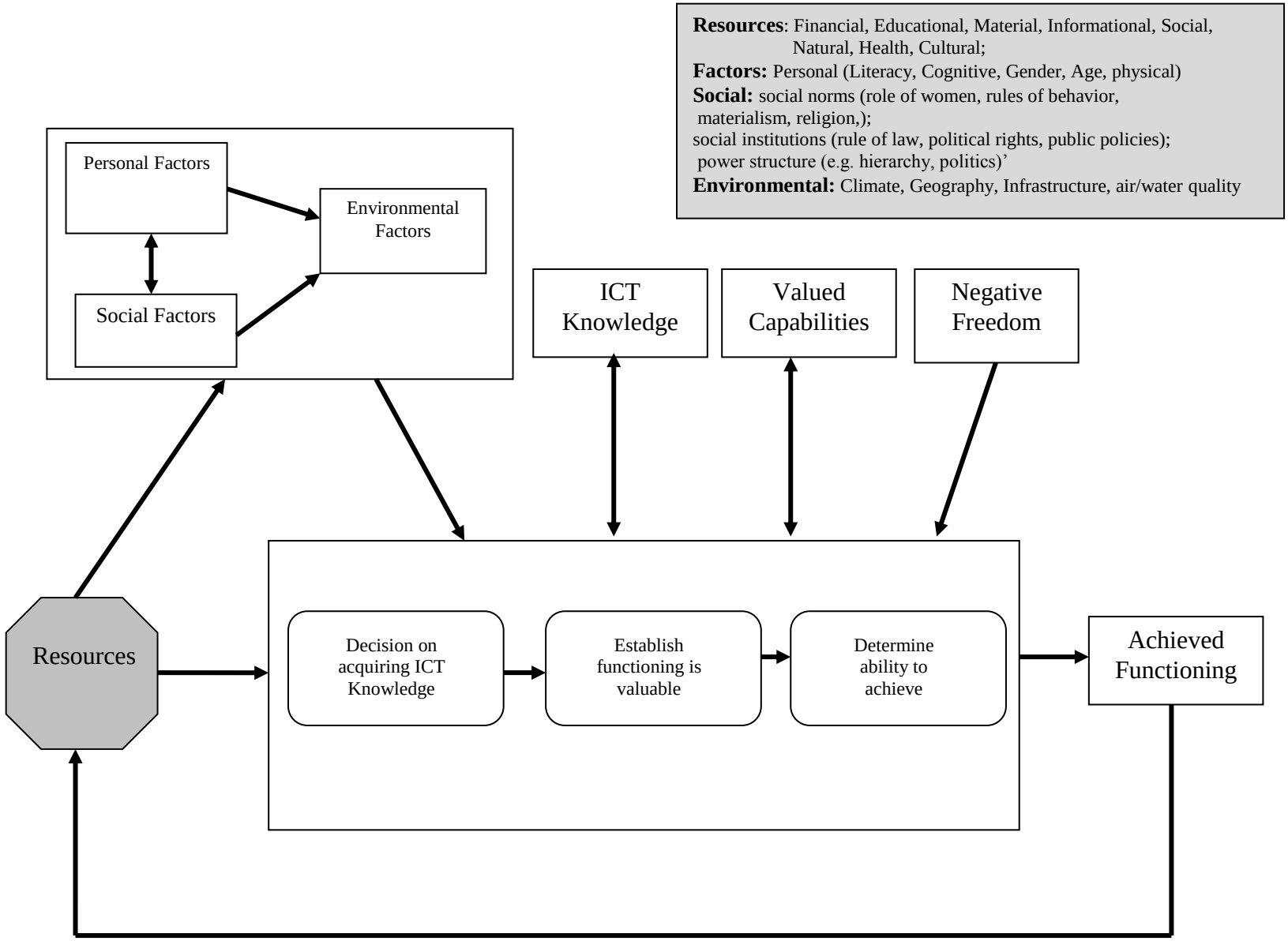


Figure 5.18: Modified Framework

6. ACHIEVEMENTS, CONTRIBUTIONS, CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes the research by reviewing the work that has been done and the contributions made to the research body of knowledge. It also gives the conclusions of the research and outlines research areas uncovered that need to be pursued further to this research.

Section 6.1 outlines what has been achieved through the study. This is brought out research question by research question. Conclusions are then drawn question by question in Section 6.2. The next section then outlines the contribution of the research to the body of knowledge. The contribution of the research to theory, methodology and practice, and the policy implications are spelt out in Section 6.3. Section 6.4 outlines fresh research directions and opportunities the research has uncovered.

6.1 Achievements

We here under outline what has been achieved through the study and this is done question by question.

In Research Question 1, we sought to establish how ICTs and other individual agency-based capability input resources influence each other and how this affects their conversion to capabilities. We hereunder briefly outline some of the key findings the study brought out.

One very important aspects that will act to enable people to get the ability to use ICTs to do what they have reason to value is access. Without access to ICTs, people will not be able to use ICTs to pursue their valued functionings. We found that resources are important in enabling access. Without financial resources, one cannot be able to get the knowledge required to use the ICTs. Other resources that are important are social resources. With the introduction of new technology in a poor rural community, the social resources were found to be important. A lot of people that benefitted from the training joined because of friends or family. Other resources include information and material resources (e.g. the computer hardware) (see Figure 5.14).

When people are able to be able to utilize the functioning opportunity availed by ICTs and they chose to pursue and achieve what they value to do, their realized functioning could be an increase in resources or the functioning could be means to increase resources. This means that once the conversion has taken place, there can be a feedback loop to realize an increase in resources which could give one more functioning opportunities (See Figure 5.17).

Some functionings opportunities require more than one resource. When that is the case, all the resources will need to be there. To pursue the functioning therefore all the resources have to be there.

The second research question sought to establish how Conversion Factors, ICTs and other resources influenced each other during Conversion. It was established that conversion factors will have an effect on access to ICTs. We already established that without access it will be impossible for one to get the opportunity offered by the ICTs. In this regard, personal factors played a big role in enabling or hindering access. These included literacy, and cognitive skills. Gender and age also played a role in that the older people were less inclined to want to pursue ICTs knowledge. Social factors included institutional, legal and political factors. These determine policy and practice on ICTs and hence could affect whether one will be able to access ICTs. Environmental factors like geography (location) will also affect access (See Figure 5.14).

Acquisition of ICTs knowledge is preceded by a decision to acquire the knowledge. This is influenced by access to ICTs and the mental attitude of the persons. The mental attitude is in turn influenced by the discourse and paradigms that exist in the community. Some social factors like gender roles and hierarchies could also affect the decision

During the conversion process the conversion factors could affect each other and this will either enable or constrain the conversion. Still on the decision to acquire the knowledge to use ICTs, one's set of valuable capabilities will play a big role. This is because one will have to determine if the potential functioning enabled by the ICTs is valuable to them (See Figure 5.16).

The third research question sought to establish how conversion of ICTs to valued capabilities take place and what the roles of the conversion factors and resources in the Conversion Process are. Our study confirmed that the poor do not always prefer to achieve basic capabilities; the capabilities they pursue are mixed between basic and non-basic capabilities and the basic capabilities are not even prioritized. This interesting finding however seems to agree with what other researchers have found out (Alkire, 2002; Clark and Qizilbash, 2007). (See Table 5.3).

The personal conversion factors were found to play a big role in determining what capabilities a person will pursue. This agrees with the capability approach which emphasizes that importance of taking on board human diversity when thinking about wellbeing (e.g. poverty reduction) (see Figure 5.17).

It was established that for conversion to take place, the person must be aware of valued functionings enabled by ICTs, and the awareness will be influenced by resources, personal factors and ICTs knowledge (See Figure 5.15).

To convert ICTs, one must first determine their ability to utilize the ICTs to achieve their valued functionings. This ability will be affected by personal factors, resources and the acquired ICTs knowledge. At this time, one must have negative freedom to ensure that the functionings will be valuable and they will not be coerced or forced (See Figure 5.15).

6.2 Conclusions

Research Question 1.
For people to be able to convert ICTs to valued functionings they must first acquire ICTs knowledge and access plays a big role in determining whether they will acquire the knowledge. Achieved functionings could lead to an increase in resources or they could be means to achieving other functionings or increasing one's resource base.

Research Question 2

Conversion involves a complex interaction of factors, resources and ICTs, with the personal factors playing a big role. Conversion will therefore be affected by a complex mosaic of these factors and the socio-environmental context and agency of the human actor will play a big role.

Research question 3:
Conversion goes through the stages of acquisition of ICTs knowledge, establishing whether one has reason to value the functioning opportunity enabled by ICTs, and the determination of the ability to pursue and realize the functioning opportunity. In each of these stages the agency of the actor is important and the result will be affected by the socio-environmental context and the resources available .

6.3 Research Contribution

6.3.1 Theoretical

6.3.1.1 The Conversion Process

When we consider the inputs into the conversion process, Kleine (2009) informs us that the interface between structure and agency includes a host of reciprocal and cumulative processes. Agency is thus presented as a mosaic of complex, reciprocal processes made up of interactions between aspects of resources and structure. This study had sought to

explore the black box of agency in order to shed light on conversion. In our attempt to answer question 3, data and analysis from the two cases led us to track the conversion process (Figure 5.16 and Figure 5.17).

We now briefly outline the various stages in the process. From the figure, it is clear that for one to achieve what they value to be or do, one goes through three stages: decision acquire ICTs knowledge, establishing whether the ICT-enabled opportunity is valuable, and determining ability to achieve valued functioning. Without deciding to acquire ICTs knowledge, the person will not acquire knowledge to utilize ICTs. Without the knowledge to utilize ICTS, they will not have access to the potential functionings that the ICTs enable and hence will not be able to convert the ICTs to the valued capability and without conversion they will not be able to achieve what they value to do or be. The forces (resources, and conversion factors – personal, social and environmental) and the relationships between them are spelt out. The research has therefore been able to trace how conversion takes place in the particular context and domain we worked in (introduction of and training in basic ICT skills for poor rural communities). We decided to generalize the framework since in different domains the particular factors and resources may be different (Figure 5.1.7). The figure has a feedback loop from the achieved functionings to resources. We observed in section 5.2.3 that in certain circumstances, the achieved functioning could lead to an increase in resources or could be a means to increase resources.

Our research sought to identify the forces that influence conversion and how they interact so that we can map out the conversion process. The forces and their interaction have been identified and the process brought out. It is evident that conversion involves three processes: decision to acquire ICTs knowledge, establishing whether the ICT-enabled functioning opportunity is valuable, and the ability to use the ICTs. We went through each of the processes looking at the forces that affect them.

It is instructive to point out that personal conversion factors affect each of the processes involved in conversion. This confirms the all important role the individual person plays in the conversion process. The individual agency has been shown to be important in the

decision-making mechanisms and in conversion process. Our research brings this out by capturing the influence of the personal factors in each of the aspects of conversion.

When we compare our final model with the framework used for the study, it is clear that the conversion process has been unpacked as we can observe the resources, the ICTs, and the achievement. The black box of agency, conversion and the capability has been opened.

6.3.1.2 Adoption of ICTs in Poor Communities

It has been shown that achievement involves four stages: acquiring ICTs knowledge, establishing whether the person has reason to value that ICT-enabled functioning opportunity, determining the ability to achieve the functioning, and achievement. The research studied the introduction and use of ICTs in a poor rural community, where the technology was hitherto unknown to most people. The technology was not mandatory and it was up to the individuals to determine whether to enroll for the training, learn, and later use them. It is apparent that the attitudes of the person will influence their intention to acquire the knowledge to use the technology. This attitude is affected by community discourses and paradigms and also by social, and informational resources. This decision is therefore influenced by the mental attitude towards ICTs.

The decision to acquire knowledge is also influenced by access to ICTs, apart from the mental attitude. For poor rural communities, access is a critical issue. If they are not able to access the ICTs, they will not be able to adopt and use them. Access will be determined by a number of issues, including the social context (political, policy, institutional, legal, norms and discourses, gender roles, hierarchies, etc.), resource availability and affordability, and personal (gender, age, literacy).

Another key influence on the adoption is a person's valued capabilities. If a person has reason to value the opportunity enabled by the ICTs, they are likely to develop an intention to use them. Conversely, where the enabled opportunity is not valued, the person is least likely to decide to use. We therefore sought to review the models that have been used to predict the acceptance and adoption of technology.

As we consider the various models, there are areas of congruence with our models but also differences. Most of the adoption models establish the factors that influence the

behavioral intention to adopt the technology. To use our terminology, behavioral intention to adopt can be compared with decision to acquire knowledge to utilize ICTs. For most models, behavioral intention is determined by the attitude the user has, which could `be influenced by some factors, including the perceived usefulness, perceived ease of use, accessibility and resources. One model that is very comprehensive is UTAUT (Vankatesh et al, 2003) because it was derived at by consolidating many other models. UTAUT avers that behavioral intention to adopt is influenced by performance expectancy, effort expectancy, social and cultural factors, and other facilitating conditions. It further states that gender, age, experience and voluntariness of use are moderating variables. While our model established these factors that influenced decision to acquire the knowledge, it incorporates the issues of value (whether the person has reason to value the offered ICT-enabled opportunity), and the determination of the ability to achieve the functioning.

Adoption models are silent on the place of agency of the individual, which is implicitly implied. Behavioral intention does not lead to use, just like decision to acquire knowledge will not necessarily lead to knowledge acquisition and use of the ICTs. While different factors will determine whether someone will eventually use the ICTs, the value plays a very great role. Whereas the 'voluntariness of use' variable of UTAUT captures aspects of value, it is not comprehensive. If the ICTs are imposed on the community, people may have to decide whether or not to use them after implementation. While they may not be forced to use them, they may still chose to use them if that is the only option. Sen (1996, pp 59) states that 'the "good life" is partly a life of genuine choice, and not one in which the person is forced into a particular life – however rich it might be in other respects.' The capability approach therefore anticipates the need to 'focus on what people are able to do and to be ... and on removing obstacles in their lives so that they have more freedom to live the kind of life that, upon reflection, they have reason to value (Robeyns, 2005, pp 94). By explicitly identifying the need for establishing whether people have reason to value the functioning opportunity offered through ICTs, our model sets it apart from the rest.

It brings in the aspect that adoption will not only lead to use (of the ICTs) but that the person will value what the ICTs will enable and this will lead to the 'good life.' Further, by our model establishing the need for determining the ability to achieve, it tackles the issue of whether the introduction of technology will lead to its use. The adoption models stop short of explicitly addressing the issues of agency and ability to use the ICTs. Adoption models therefore do not address the central issue of freedom. It is instructive to recall that most of the adoption models developed from empirical work in organizations. They may therefore profit by incorporating research on adoption at societal level. They would also have to deal with the issue of freedom and conversion, which they do not presently cover because conversion will take place between behavioral intention and use.

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6.3.2 Methodological

Our research was an inductive study which adopted a multi-case study. Instead of using contrasting aspects of the study issues, it was used to compare the findings between the two cases as a way of validating the findings. For each of the cases, to ensure triangulation and transferability, three methods of data collection were utilized. These included microethnography, in-depth semi-structured interviews and a focus group. The combination of a multi-case study and the three data collection methods ensured that there was rich accounts of the details of the study and that there was validation of the data and the findings. For clearly uncovering information in agency during conversion, it may be necessary for the researcher to incorporate full ethnography.

6.3.3 Practice – the design of ICT Interventions and Projects for Poverty Reduction

As we consider the use of ICTs in poverty reduction initiatives/projects, findings from our research can recommend aspects that need to be considered during conception and design. We have established that before persons can achieve what they value to do or be using ICTs, they must first acquire the knowledge of using them, be aware of the valued functionings they can enable, and determine that they indeed have the ability to use them. We have seen the factors that affect the decision to acquire ICTs knowledge, which include mental attitudes towards the ICTs and access to the ICTs. These are in turn

affected by personal and social factors, and some resources. To ensure that the ICTs rolled out will be adopted and used by the community, the conception and design must take into consideration these factors and resources. The design must therefore be capability sensitive. Capability-sensitive design is one that seeks to incorporate conversion factors into the design such that the artifact will enable people to realize valued capabilities (Oosterlaken, 2009).

In our case, during the conception and design, the designers must study the community to establish the personal factors that stand out. The social factors that affect the accessibility, uptake and use of the technology by majority of the people. The design must take on board this information so that the design will make allowance for the factors or put in place mitigations to counter any constraints to access and any negative effect on the decision to adopt. Further, the designers must establish the resources that affect the attitude and access and ensure that their effect is addressed so that majority will get access and any negative attitude is dealt with. Negative attitudes about ICTs may be brought about by beliefs about ICTs and their effects that may not be factual. We came across situations where people failed to enroll for the ICTs training and even forbade their children from enrolling for training because they believed the ICTs could negatively influence the morals of the youth. If this was because the belief was prevalent in the community, then we could engage the community and address the issue through participation so that the false notions could be dealt with. That may have a chance of influencing the attitude of the people for the better leading to a higher chance of making a decision to acquire the knowledge.

The conventional design of technology does not address the concerns we are talking about. ICT4D researchers, upon noticing the need for these contextual factors to be incorporated into the design have recommended the need to incorporate Human Computer Interaction knowledge and techniques to ICT4D interventions (Heeks, 2009), and especially user-centred design. User-centred design stands out because it places the user in the centre of the design process. The designer works closes with the user to establish the usage context (using ethnographic techniques). Design is iterative and involves prototyping, testing (with target users) and redesign with the feedback from the

user. By its nature and practice, user-centred design will not address the concerns being raised here. The objective of user-centred design is to increase the usability of the system and improve the user experience. Capability sensitive design however looks at the socio-environmental context, the personal factors that can enable of hinder the uptake and use of the 'solutions' being offered.

Questions that it would address include, what is the effect of the institutional, legal and political environment on the ability of the people to access and utilize the technology on offer? What personal factors enable or constrain the uptake of the technology? What functioning opportunities does the proposed solution avail to the people? Will the majority of the people have reason to value the offered opportunity? What needs to be done to address the value issues? How can the solution be designed so that it "fits" into the environment or what mitigations can be put in place so that the people are better placed to utilize what is on offer. Will this solution work to deliver what it offers or should we discard it in the light of the environment? User-centred design is important in the design of systems but it will be incorporated when the contextual issues have been identified and addressed or decisions made that will impact the physical design of the system.

We have observed that during conversion, a person will first become aware of the available functionings through the ICTs. If the ICT-enabled interventions are geared towards providing the freedom to achieve a specific functioning, the designers must ensure that the community has participated in identifying valued capability deprivations so that upon the implementation of the intervention, the people will be well aware of the functioning opportunity the ICTs will enable. We also saw that the awareness will be influenced by some resources among them educational, social and informational. The designers need to ensure that they will ensure the information or training is availed to the community. Further, we saw that the people will then establish whether they have the ability to achieve. This ability is determined by ICT knowledge, required resources and any other specialized knowledge. The designers must ensure from the onset that the people will have or be able to acquire the required resources and that they possess the required knowledge and information or be trained in the same.

6.3.4 Policy Recommendations

As we consider the future of ICT4D and ICT for poverty reduction, there is need to consider how our research findings can influence policy. To ensure success of the ICT4D/ICT-for-poverty reduction projects, people must be able to convert ICTs to capabilities. For this to happen, development agencies must prioritize the following:

- Work with the community to identify valued basic capabilities (say through participation) that the interventions will seek to achieve. This is because as we have observed, different people will value different capabilities. Even though the capability may not necessarily be basic, it must be taken on board. Interventions must then be premised upon these valued capabilities.
- Identify different profiles of the community members with their unique personal factors and the social factors at work in the community.
- Identify the availability of resources that are likely to affect the adoption, use and conversion of ICTs to valued capabilities
- Design or select ICT interventions that can be used to realize the valued functioning associated with the identified basic capability. The design of the ICT intervention must be capability-sensitive, incorporating conversion factors that can enable realization of the functioning and must take care of those factors that can constrain the realization.
- The design of the intervention must also incorporate the resources available to the community members, which can affect the adoption and conversion process
- In the choice and design of ICT interventions, there is need for community participation, negative freedom and guarding against elite capture.
- Where there may be need for value change in the community, or where there are negative discourses that have adversely influenced the beliefs and attitudes towards the proposed technologies, the community could be engaged in a public discourse to address the negative values, beliefs and attitudes. This could be done through respected community champions.
- Ensure people acquire the required knowledge or training to utilize the ICTs selected/designed

- Ensure people have the ability to realize the functioning using the ICTs on offer by making sure people can access, afford, and utilize any resources required.

Where ICTs are the technology of choice in poverty reduction projects, the projects need to be conceptualized and designed with the criteria identified. The policies and strategies of development and donor organizations that sponsor poverty reduction projects with ICTs must incorporate the issues identified above.

6.3.5 Generalizability of the Research Findings

The domain of this research was ICT basic skills training in two poor communities in western Kenya. The findings and conclusions are therefore for the introduction of ICTs knowledge to poor rural communities. As we think about the findings, we need to consider how much they can be generalized to other areas and domains. Generally, in-depth case study research is used to either build theory where none existed, or for investigating details of some aspects of existing theory in particular unique contexts, or for confirming the theory in the unique contexts. Generalizing the findings of a case study should therefore be done with caution. For our case we sought to explore how ICTs can be converted to valued basic capabilities for the purpose of poverty reduction. The findings are therefore attempts at understanding the conversion process. More research in other domains and contexts and with other ICT solutions/applications needs to be done to validate and confirm the findings. It is worth noting however that in this research, the ICTs introduced were not particular applications aimed at achieving specific functionings or livelihood outcomes. The intervention did not even involve rolling out hardware infrastructure and software applications in a community technology centre that other initiatives have done. The two projects only introduced and trained people in basic ICT skills and left it to the people to decide whether they will adopt and use them and for what purpose. This is a case where the person could use the new skills in different contexts and environments to achieve whatever they desire. For this reason, the opening of the conversion 'black box' and mapping of the resources, factors and ICTs and their interaction, with the resulting enabling or constraining action, is useful in getting a deep

understanding of conversion and could prove useful in thinking about conversion in other domains and contexts.

6.3.5 Dissemination of Research Findings

During the research process, a number of findings have been disseminated. Below is list of the work that has been presented:

Paper Submitted for review to the 8th International ICT4D conference

- Ruhiu, S., Waema, T. M., 2016. ICT for Poverty Reduction: Exploring the Process of Converting ICTs to Valued Basic Capabilities.

Papers Presented in Peer-reviewed Conferences

- Ruhiu, S. (2013). Capability Approach Based ICT-for-Poverty Reduction Framework. Proceedings of the 12th International Conference on Social Implications of Computers in Developing Countries, Ocho Rios, Jamaica, May 19-23rd, 2013.

- Ruhiu, S., Rodrigues A. and Audenhove, L., 2009. Donor-Supported ICT-for-Poverty-Reduction Initiatives: Which Way Forward? VLIR-UIC-UON International Conference, February 2 – 5, 2009. Naivasha, Kenya

- Ruhiu, S., Rodrigues, A., and Audenhove, L. 2007. Utilization of ICTs for Poverty Reduction: Towards a Poverty Reduction Framework. 1st International Conference in Computer Science and Informatics, February 5 – 7, 2007. Mbagathi, Nairobi, Kenya.

- Ruhiu, S. and Rodrigues, A. 2005. Towards a Framework for ICT Uptake in Developing Countries. 1st Annual International Conference and Workshop on Sustainable ICT Capacity in Developing Countries, August 9 – 12, Makerere University, Kampala, Uganda.

6.4 Further Research Opportunities

In both of the cases we worked with, the technology we encountered was ICT basic skills training. The alumni left with skills in the use of ICTs and with an idea of the potential of ICTs for use in their everyday lives. It was thus up to them to determine where and how to use their new found skills and the type of ICTs to use in the process. Our findings were therefore in this area of introduction of ICTs and skills training in the community. It would be interesting to investigate the conversion process in a different domain - one where a different ICT intervention has been used. The findings of such a study would be used to either validate our findings and/or uncover other aspects of conversion.

In our investigation, the conversion factors we encountered were limited. These included personal factors like literacy, age, gender, and mental (cognitive) attitudes and beliefs. The social factors we encountered included discourse and paradigms, norms and customs, while the environmental factors we worked with included geography, infrastructure and access (to ICTs and resources). We propose a study that involves more factors, especially Policies, Laws, and Institutions. This is because generally these have an enabling or constraining effect on conversion at a higher (national) level. These macro level factors would still have an effect at the micro level and their influence on conversion would therefore provide an interesting angle to conversion.

In our quest to open the black box of agency and understand conversion, we have shed more light on the conversion process; the interactions between ICTs, resources, and factors and the place of the human agent in the conversion process. We have observed that for one to have the freedom to achieve valued functionings, they go through three stages: deciding to acquire knowledge on the use of ICTs (which hopefully will lead to them acquiring the knowledge), establishing that they have reasons to value the functioning opportunity on offer, and determining their ability to achieve the valued functioning. Once one has gone through this, we can say they have the freedom to realize the functioning opportunity on offer through the ICTs. We propose that more research be carried out to validate the framework. This can be done by studying projects designed for

achieving different functionings in different domains. The framework could also be validated quantitatively.

To establish the applicability of the new framework, comparative research could be carried out (for community interventions in poor rural communities) alongside other more established models like TAM, TRA, TPB and UTAUT.

Action research on an ICT intervention which is developed using capability –sensitive design. The intervention is implemented and the outcomes evaluated. The results can then be compared with systems designed with ‘conventional’ methodologies

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APPENDICES

Appendix A: UCRC Data Collection Instruments

Observation Guide

1. Number of ICT services businesses/Cyber cafés/ICT training schools in the town
2. Who patronizes the cyber cafés? (Profile – men/women, youth/aged, level of education)
3. What services do the cyber café patrons mostly use? (mail, social networks,information access and downloading, Research, accessing government sites for information and services, work-related, business, e-learning, Skype)
4. What services are mostly used in the ICT services businesses?
5. Ugunja town and environs (Livelihoods occupations, businesses)
6. Indicators of poverty

UCRC Management Interview Guide

1. What was the vision behind the training?
2. What were the reasons the training was conceived? (rationale, motivation)
3. What was there community involvement/input in conceiving and implementation of the project?
4. What was the role of Microsoft?
5. What were the requirements/prerequisites for the training?
6. Who was the target group?
7. How was awareness/mobilization done?
8. What was the view/reaction/attitude of the community towards the training?
9. Describe the profile of the trainees (age/gender/literacy/education level/vocation)
10. How long did it take and when was it stopped and why did it stop?
11. How would you describe the coverage of the training in the community?
12. What was the outcome of the training in the community?
13. How would you describe the impact of the training in the community?

ICT Skills Training Alumni Interview Guide

Livelihoods (Proxies of valued functionings)

i. What do you do for a living?

ii. For how long have you done this?
iii. What influenced your choice of what you do for a lining?
iv. Do you value/like what you do for a living?

The ICT Skills training

i. Describe the ICT training you attended at UCRC
ii. How did you decide to undertake the training? Was it your choice?
iii. How did you learn about training?
iv. How have you utilized the training in your life?
v. In what way has the training you received at UCRC influenced/affected what you do in life?
vi. How has your life been affected/changed since you received the training/got the know-how?
vii. What are some of the treasured things you do since you got the know-how that you could not do before?
viii. Of the things in life that are important and you cannot do without, do you need the IT knowhow and in what way?
ix. Of these important things that are important and cannot do without, are there some that you presently cannot do without you utilizing the ICT the knowhow?
x. What aspect of the know-how do you use for doing what is important in your life?
xi. When and how did you realize that there was potential in acquiring the knowhow to better your life?
xii. How did you become aware of the important possibilities offered by the training/know-how
xiii. How has acquiring the know-how increased the choices in your life?
xiv. Before you could use the know-how for your life's important activities are there things you needed but was unable to access/get them?

Aspects of Conversion and effects of Conversion factors

i. What aspects of the training/know-how translate to the things you value to do in life?
ii. What aspects of the knowhow did you translate into things you value and how did you do this translation?
iii. What conditions affect the utilization of ICTs to enable one to what they value/consider important?
iv. Describe how the know-how has given you access to IT and how this access has enabled you to do important things in your life.
v. What did you believe about the computer/IT before the training? Did this belief influence your willingness to do the training and use of the training?

vi. What does the community believe about ICT/computer use? – did this affect your decision to attend the training and use of the know-how in any way? (how)
vii. Do you have ready access to ICT technologies? How does this affect the way you use them in your life in the things that you value/consider important in your life?
viii. How does ICT know-how affect your access to resources? (e.g. access to information, education, social interactions/connectedness)
ix. What else affects your access to resources?
x. Do community beliefs/norms/customs affect ICT/ICT know-how?
xi. What other thing affects the way you use the training/knowhow in your life (e.g. cost of access, policies of government/CCK/Service providers)

Personal (investigation the role of personal conversion factors)

i. What was your motivation for joining the training and using the know-how?
ii. What led you to acquire the training and use it?
iii. How did you start using the know-how in doing what you?
iv. How did you convert the IT training/know-how to do what you consider important in your life?
v. In what other areas of your life do you use ICTs?
vi. Does the IT know-how give you more choice to pursue or achieve what you really consider important/valuable?
vii. Are you coerced to use ICTs to do what you consider important?

Resource inputs (Means)

- What did you need to have before you could attend and utilize the training (e.g. education, information, knowledge)?

Valued Functionings possibly enabled by ICT know-how/use

i. How does ICT enhance your social connectedness/interaction? [In what way is this of benefit to you?)
ii. How does the utilization of ICT know-how make you feel/look like in the community in your own eyes and in the eyes of others?
iii. Does the ICT know-hoe elevate you social statues in the community?
iv. In what way has IT know-how increased the choices you have in life?
v. In what way has ICT know-how improved your life?

Conversion of Resources

i. How do people use the resources they have (e.g. knowledge, abilities, education, materials, finances, information, networks) to do what they love to do and to work for a living?

ii. Do people use IT/IT Knowledge to access or interact with or acquire these resources?

How?

iii. In the process of using these resources to do what you do for a living and love to do, do you utilize IT/IT knowledge?

In what way?

Conversion Factors

i. What is it about yourself that has helped you to take up IT and use it in and for your life?
ii. Has your knowledge of IT influenced what in you helps you to use IT for your everyday livelihood?
iii. What in life and in the community and environment can help or hinder people from using ICT in their everyday life activities? [How does this work?]

Awareness and Agency

i. At what point does one become aware of what they can do with IT?
ii. What helps them to be aware? (Conversion Factors? IT?)
iii. As people consider what to do with IT, are they usually free to do so or do they sometime find themselves forced to do certain things? How can IT knowledge assist them?
iv. As you think what have you been able to do with your IT knowledge, so far, what about IT makes this possible?

Conversion

i. When you have IT Knowledge and access to IT resources, and other resources, how does one go about translating/converting/using them for their livelihood or what they love to do or in their everyday life activities? [Process]
ii. What can assist you in this conversion and what can hinder you? (personal, societal, environmental)
iii. What normally helps a person and what can hinder a person from choosing what they would like to do or not do, say with IT in their life ?

Appendix B: UCRC Focus Group Discussion Guide

Section A

iv. How do people use the resources they have (e.g. knowledge, abilities, education, materials, finances, information, networks) to do what they love to do and to work for a living?

v. Do people use ICT/ICT Knowledge to access or interact with or acquire these resources (in i) above or other resources)?

If so how does this take place

vi. In the process of using these resources to do what you do for a living and love to do, do you utilize ICT/ICT knowledge?

If you utilize ICT, in what way do you do it?

Section B

iv. What is it about yourself (your attributes or characteristics or abilities or skills, or interests) that has helped you to take up ICT and use it in and for your life?

v. Has your knowledge of ICT influenced what in you helps you to use ICT for your everyday livelihood?

vi. What in life and in the community and environment can help or hinder people from using ICT in their everyday life activities? [How does this work?]

Section C

v. At what point does one become aware of what they can do with ICT?

vi. What helps them to be aware?

vii. As people consider what to do with ICT, are they usually free to do so or do they sometime find themselves forced to do certain things? How can ICT knowledge assist them?

viii. As you think what have you been able to do with your ICT knowledge, so far, what about IT makes this possible?

Section D

iv. When you have ICT Knowledge and access to ICT resources, and other resources, how does one go about translating/converting/using them for their livelihood or

what they love to do or in their everyday life activities? (Describe the process of converting/translating)

v. What can assist you in this conversion and what can hinder you? (at the personal or social or environmental level)

vi. What normally helps a person and what can hinder a person from choosing what they would like to do or not do, say with ICT in their life ?

Appendix C: SSV Interview and Observation Guides

Interview Guide for ICT Basic Skills Training graduates/beneficiaries

Conversion Properties	**Preliminary Exploratory Codes**	**Research Sub Questions**
Resources	**Resource**	
ICTs • Describe the Training you underwent at SSV • What did like most about that training? • What in the training do you find most useful or what do you use most? • What motivated you/attracted you to come for the training? • What do you think hinders people from being trained in IT or using IT?	ICTs - Training	1
Resource Characteristics • What do you need to do what you do for a living and what you love to do? [materials, financial, physical, Education, Information, Social, natural]	Resource - Characteristics	1.2
ICT Effect on Resources • Do you use IT/IT Knowledge to access or acquire or interact with these resources? How?	Resource - ICT Effects	1.3
Conversion of Resource Characteristics • How do you use the resources	Resource - Conversion of R-Characteristics	1.4

you have mentioned above to do what you love and your livelihood?		
ICT Influence on Conversion of Resources • As you use these resources to do what you do for a living and love to do, do you utilize IT/IT knowledge? In what way?	Resource - ICT Influence on Conversion	1.5
Conversion Factors	**Convert-Factor**	
Influence of Personal Conversion Factors on ICTs use • What about you has helped you to take up IT and use it for your life? • What did you believe about ICTs before the training and know how? • What influenced that believe? • What do you believe now? • Is there a change and what brought the change? • Did your knowledge on IT have an effect on this change? •	Convert-Factor Influence on ICT - Personal	2.1
Influence of Social Conversion Factors on ICTs use • What do people in the community believe about ICTs? • Would this believe have an effect on what they are able to do with ICTs • What may have shaped this believe?	Convert-Factor Influence on ICT – Social	2.2
Influence of Environmental Conversion Factors on ICT Use • What in life and in the community can help or hinder people from using ICT in their every day life activities?	Convert-Factor - Influence on ICT - Environmental	2.3
Conversion Process	**Conversion**	
Availed Valuable functionings	Conversion -	3.1

• What have you been able to do with your ICT knowledge? • What about IT makes this possible? • Apart from IT, what else do you require in doing what you do with IT? • What else can you be able to do with ICT knowledge? • What else is possible with ICTs?	functionings	
Awareness of Valuable Functionings • At what point did you become aware of what you could do with IT? • What made you aware? (Conversion Factors? IT?)	Conversion – Awareness Functionings	3.2
Ability to make valuable choices • Do you love what you do for a living? • Are there things in life you would like to do but are unable? What? What hinders you? • What you do for a living and the other things you do with the IT knowledge - is it your choice or are you forced by people or circumstances? • How did you make this choice and what helped you? • How has IT helped you to make this choice?	Conversion – Choices Ability	3.3
Ability to exercise Negative Freedom • Are there things you are presently doing that have been forced on you against your choice? What and what forces you?	Conversion - Negative Freedom Ability	3.4
ICT Role in Conversion • How do you use IT in what you do for a living and what you like to do? • How does IT help you or hinder you?	Conversion - ICT Role	3.5
Effect of Personal Factors on	Conversion - Personal	3.6

Conversion to Functioning • In doing what you do for a living and consider important, what helps you most and what hinders you most? [Personal issues, other people other issues] • How can you use IT to assist?	Factors Effect on Conversion	
Effect of Personal Factors on Awareness of Functioning • What can make a person aware or hinder them from being aware what is possible with ICTs • Is there any way IT knowledge can help in the awareness?	Conversion - Personal Factors Effect on Awareness	3.7
Effect of Personal Factors on Ability to make Valuable Choices • What helps a person and what can hinder a person from choosing what they would like to do? • Can IT knowledge play any role in this?	Conversion - Personal Factors Effect Choice Ability	3.8
Capability	**Capability**	
Decision on ICT Characteristic Selection	**Decision ICT**	
Selection Decision on ICT Characteristics • How did you choose what in IT to use for your livelihood?	Decision ICT - Selection ICT Characteristics	3.9

SSV Management Interview Guide

1. What was the vision behind the training?
2. What were the reasons the training was conceived? (rationale, motivation)
3. What was there community involvement/input in conceiving and implementation of the project?
4. What was the role of Microsoft?
5. What were the requirements/prerequisites for the training?
6. Who was the target group?
7. How was awareness/mobilization done?
8. What was the view/reaction/attitude of the community towards the training?

9. Describe the profile of the trainees (age/gender/literacy/education level/vocation)
10. How long did it take and when was it stopped and why did it stop?
11. How would you describe the coverage of the training in the community?
12. What was the outcome of the training in the community?
13. How would you describe the impact of the training in the community?

Observation Guide

1. Number of ICT services businesses/Cyber cafés/ICT training schools in the town
2. Who patronizes the cyber cafés? (Profile – men/women, youth/aged, level of education)
3. What services do the cyber café patrons mostly use?
4. What services are mostly used in the ICT services businesses?
5. Sega town and environs (Livelihoods occupations, businesses)
6. Indicators of poverty

Appendix D: Data Management Repository Structure

Main Folder	**Sub-folders**	**Sub-folders**	*Files* & **Sub-folder**		
Research	**Case 1**	**Questions Write up**	*Question 1 File; Question 2 File; Question 3 File*		
		Report	*Case Description Report File; Full Analysis Report File*		
		Audio	*Informant Audio Files [1 - 10]*		
		Transcripts	*Informant Files [1 - 10]; Observations File;*		

			Document Summary File		
			Study Areas Sub-folder	*ICTs File*	
				Resources	
				Conversion Factors	
				Capabilities	
				Conversion	
				ICTs Coding Table File	
				Resources Coding Table	
				Conversion Factors Coding Table	
				Capabilities Coding Table	
				Conversion Coding Table	

Appendix E: Analysis Table - Conversion Factors: Case 2

	Raw Interview Transcript	**Preliminary Concept**	**Refined Concept**

1	**Conversion Factors - P - Effect on ICTs - Informant 2** **Qn. It's interesting that in the beginning you did not like computers at all. What contributed to that, how is it that you felt negative about them, why did you did not like them?** Ans. First of all I do not come from a family that is well off; we are materially challenged - but not poor. My father used to tell me, 'Behave like a person who knows what he wants. *Do not just pursue things that are there for leisure, entertainment.'* So he used to restrict me - I could not access his phone, he used to tell me that if I want a phone I should go to my teacher if I needed to call home. *So I really just hated technology like computers and phones because I considered that they contain some filthy content that can destroy somebody's life.* Until I reached form four, then I came out of form four, then I started thinking about SSV. I wondered - 'what are they doing?' I then went to George and he explained to me and gave me the advantages of being IT literate, and I then build interest in computer.	*Belief that pursuing leisure and entertainment for their own sake is undesirable* Believe that technology is for leisure and entertainment *Belief that IT contains harmful content led to negative attitude towards IT* Ignorant of advantage of IT literacy Awareness of advantages of IT knowledge leads to interest	*Negative Technology Discourse* Discourse Effect on Computers *Negative IT Attitude* IT Ignorance Awareness led IT Interest
2	**Conversion Factors - P - S - Effect on ICTs - Informant 4 - Qn. Before you came for the training, what did you believe about the computer? Was that belief positive or negative? And did that affect your willingness to come for the training?** Ans. *My opinion was positive;* though I *was being discouraged by some of my friends - that the computer will [as a youth] disorient your mind; because of the bad pictures, those people that walk naked - so they were saying that with the computer you will be ruined and you will find yourself indulging in other things that you are not supposed to like Alcohol. Because with computer you can see everything any time you want. For me I was being positive, because you cannot do something when you are not willing to do it.* Something somebody does from his or her own opinion is a decision you make so *with me I saw computer was very positive, because it was going to help me not just at that time but also in the near future - I know it is going to help me. So those are my positive motivation towards computer.*	*Positive IT Belief* *Negative IT Discourse*	*Positive IT Belief* *Negative IT Discourse*

3	Conversion Factors - S - Effect on ICT - **Informant 6 -** Qn. What about the people in the community - whether here or back in your home in Kisumu - what do people generally believe about computers? Ans. *Some people believe that the computer is for specific people; that computer is for those who are learned, those who have a certain level of learning.* Like if you observed the people who come to pursue computer training at SSV, most of them are people who have completed form four. The ones who have only completed stand eight are very few. *So there is a belief that computers are for those who already have something in education.*	*Belief that IT is for the more educated people* Belief about IT can influence IT adoption	*Belief about IT* *IT Belief Effect*
4	Conversion Factors - P - **Informant 5 -** Qn. Before you were trained or before you got the knowledge, what did you believe about computers? What was your attitude towards it? Ans. *I believed it was interesting because I used to see a lot of people using computers so I got interested and wanted to learn more and more about it.*	*View on IT can influence attitude towards IT adoption*	*Effect of IT belief*
5	**Conversion Factors - DPP - Effect on ICTs Informant 1** **Qn. Before you came for the training, what did you believe about the computer and IT - that is before the training; and did what you believed about the IT [computers] influence your willingness to come and get trained and use it?** *Ans. My belief before I came for the training was that having the knowledge will make me different from other people who do not have the knowledge, in different occasions and in different ways, because now I will be able to undertake most of my duties with a lot of ease if I have the knowledge of computer, and my greatest belief also was that with time, the way I was seeing things moving, it will be very important to have the knowledge and indeed I am seeing it - where we are moving, it is very advisable that you have the knowledge of computer. I believed that at each and every point I will need that knowledge.* The knowledge is very important - it is very important - so that was my great belief and great urge - and I was seeing that, that was the only time I was having time to come and take it because may be I may need it at a time that I don't have that time; like I came that time, I got the knowledge, and now I'm using it at the university. Even though at the University we are being taught I get it very easily. I still belief I need much more knowledge in IT so that I can now improve my own life, improve the life of the community, and improve the life of everybody .	*Positive belief about enabling role of IT in everyday life* Positive Belief in IT led to training pursuit	Positive IT Belief Effect of IT belief
6	**Conversion Factors - S - Effect on ICTs - Informant 4 -** Qn. Clearly from your explanation, there are people who view computers negatively or are fearful, or they .. Ans. They believe computers disorient the youths' mind, and the children - such things.	Some people believe IT can disorient children and youth	Community IT belief

7	**Conversion Factors - S - Effect on ICTs - Informant 4 -** Qn. So, such people will definitely not get involved or they may dissuade others from getting involved. So there are such people in the community? Ans. Yes, there are.	Negative belief hinder people from adopting IT	Community Belief Effect
8	**[Conversion Factor - S] - Informant 3 -Qn. [You live here, you live here, you learned computing here and began to use it for your work] But there a lot of people out here [in the community] - what do they be lieve about computers?, what is their attitude?** Ans. The problem we are having here [in this community] is that *many people are not willing to follow up and know exactly what is happening with this particular item [the computer/IT sector]*, but for the few who have heard about it, are appreciating and saying it is a good thing, it's important. **But for the few others are assuming that computers are for leisure; the way people are saying that there are dirty films being posted on the** Internet, so some people even restrict their children from getting into the computer because they are assuming that once a youth gets exposed to the computer they will get exposed to those dirty films which are being posted on the Internet. But for me I say it depends on a person - it depends on what one wants in a computer. If you want to use it for your business, and you understand it then it's very important.	*Many people are not willing to learn about IT* IT Awareness can positively change belief and attitude about IT **Belief that IT is for leisure** Belief that there is harmful content on Internet Negative attitude about IT can restrict one from learning	*Unwillingness to Learn* *Awareness Influences Belief* **Belief on IT** Belief on Internet Content Attitude Effect on Learning
9	**[Conversion Factor - P] Informant 3 - Qn. Before you interacted with Mr. Lawi and helped him set up the Internet Access point, and got talking to him, what did you believe about computers, IT, Internet? What did you think about it before you got exposed?** Ans. *I used to see computers and I at the time felt computers were for those who were very much learned, for those at University to do their research work; I did not know that it is something all of us can use. I thought that it was supposed to be used by those who are rich, or the very learned.* I used to tell myself that may be one day I will get close to the computer and learn and become part of it.	*Lack of IT knowledge can lead to wrong beliefs about IT*	*Illiteracy Effect on IT Belief*

10	**CONVERSION FACTORS - DPP / Resources - Informant 1 Qn. What about the community here - What do they belief about IT; what is their feeling about IT?** Ans. What I can say is that *almost everybody has the desire to have the knowledge*. Most of these people who have gone to school and they still don't have the knowledge; even those who did not go to school, but most people around here have gone to school and they have that desire to get IT knowledge; because *they believe that having that knowledge of IT can really help them and make someone to have a lot of information, unlike someone who does not have the knowledge completely. So the community around is happy with IT* and; and you could see that when they were starting this project -at first it was free - each and every person was coming in and it was like they took a lot of time when it was just free. And when this project started, it was about making everybody to have the knowledge. If you go to that school, Kogere, I was telling you about, it was those people [Simba friends] who took computers there - they took 20 computers there, my former secondary school is having 20 computers which just came from the same people, they distributed a lot of computers around, and *the community was very happy, and people were really struggling just to have that knowledge* . ***The whole community believes that having that knowledge is very important,* but there could be some misunderstanding from *some people - they say: children who get to used to this Internet - they are not morally upright*; that one is also there the issue of people coming to the Internet and you find them just watching movies which are not recommendable and sometime even the Internet is also addictive** - you get somebody is ever on facebook, from morning to evening - just to facebook, playing these computer games - I see it even at the university; everybody is so busy with the computer games that every free time somebody is always playing computer games and the game is not adding value to you. It is not bad to play a game but even if you play for twenty minutes Comment by Interviewer: So I think it would be in order to say that the fact that the fact that the community is positive about IT, it has helped people to at least come for the training. May be the older people encourage their children to come - the young actually come - so that positive attitude influences the people to get this training.	*Belief that IT knowledge will help in information acquisition* **Mixed Belief about IT Knowledge** Positive belief about IT led to demand for IT training Negative discourse about the ills of ICTs will affect the view, adoption and use of ICTs	IT Belief IT Belief Effect of IT Belief Negative ICT Discourse
11	Conversion Factors - P - **Informant 5 -** Qn. If you look back and think to your training, how you were able to do this work, *what about you as a person helped you and enabled you to take up IT and use it?* Ans. *I believed in myself I can do it and then I go for it and start learning about computers*	*One's belief about IT can influence IT take up*	Personal IT belief

12	**Conversion Factors - S - Effect on ICTs** - **Informant 4 -** Qn. But that means in the community in Sega, there are people who are positive, who are willing to pursue and get trained, and there are also people who are negative ... Ans. Obviously *in a community, you will find different people with their decision to make: some are positive while others have their own views about certain things. Like computer - I know not everybody likes computers.*	*Both Positive and Negative beliefs about IT in a community*	*Mixed IT Beliefs*
13	**Conversion Factors - P - Effect on ICTs - Informant 2 -** Qn. Is it just you or are there people in the area who have a negative view of IT? Ans. Yes, there are. First of all, let me start with Kogere CKC. where I am. People are really having an negative attitude towards the IT. I have tried to talk to them, I have tried to mobilize, I have tried to go from house to house, telling them and I managed to convince some. But in the beginning they have a very negative attitude about the IT, especially the parents. First of all, they think that when they send their children at the training centre, they will meet others there, ***and then the issue of Internet, what Internet contains.... So they say that computers are just a distraction to somebody's life.*** *So they have a negative attitude, and then they are reluctant to know anything about IT.*	***Belief that Internet contains harmful content*** Negative attitude on IT in the older community members *Negative attitude stops them from learning*	*Negative IT Belief* Parents' Negative IT Attitude *Barrier to Learning IT*
14			
15	Conversion Factors - P - S - **Informant 6 -** Qn. Please explain again what you believed about IT before you came for the training. Did you think it was a good thing? What could it do for you? What could it not do for you? Ans. When I was in primary 8, our science teacher - who was also the headmaster of the school - used to tell us that we must make sure we learn computers. He would tell us that even for those that imagined they will look after cattle when they grew up there will be robots (controlled by the computer) that will look after and take care of the cows. He even told us that for those who were planning on pursuing a driving career, in future they will design computer-controlled cars that will operate without drivers. He therefore told us that it was mandatory to learn computers. When we heard this we said, "Wow, it seems everything will be controlled by computers!" *We therefore told ourselves that we must learn computers. When we got to secondary schools the issue of computers was there and we learned that in the future everything will be done with computers. Some people still took computers for granted while for people like me I took it very seriously*.	People we look up to can influence our view on IT *Positive belief on IT can positively influence IT adoption*	Influence of Leadership on Discourse Effect of Discourse on Adoption
16			

17	**[Conversion Factor - P] - Informant 3 - Qn. So after you got exposed, both through Mr. Lawi and afterwards you got trained, explain how that changed - your beliefs, your attitudes..?** Ans. *It has changed my attitude and my understanding because I find that the computer is a very vital tool. It is something that can widen understanding of many people because it has a lot in it. Secondly, I came to realize Computer is very addictive - when you get yourself [get hooked into?] the computer, sometimes it is very hard to walk out of it.* ***Also computer teaches you once you start working on it - it moves you from one step to another, it motivates you to be a friend to it all the time***. *So I came to realize that computer is friendly to various people, not just the researchers and the university people, but to any person who is willing to learn computers, it is friendly to people.*	*IT awareness and knowledge can change the beliefs and attitude towards IT* **Computer can motivate** *Computer is friendly*	*IT Awareness Influence on IT beliefs* **IT Motivation** *Computer Friendliness*
18	Resources - Effect on ICTs / **Conversion Factors - P - Effect on ICTs - Informant 5 -** Qn. There are people in this area who have not come for training and do not use IT like you do. What do you think hinders people in this area from being trained and using IT? Ans. Sometimes it may be lack of money because one needs to pay the computer training fee. *There are some people who have not gone to school or they did not manage to complete form four and they feel since they dropped out of school and they maybe reached class eight they cannot come and learn computers and they feel since they have low education they can't learn computers,* because they have low self esteem	*Belief that people with low or no education cannot learn IT* Low esteem can hinder IT adoption	Hindrance to IT adoption
19	Conversion Factors - S - Effect on ICT - **Informant 6 -** Qn. But now from your experience and what you have been able to do: What do you think - is that a reasonable assumption? Ans. For me I believe that everybody can be taught or can learn something. These are mythical believes which are not true.		
20	Conversion Factors - S - Effect on ICT - **Informant 6 -** Qn. *Would you say that those beliefs have hindered some people so that they are not able to come and get trained and use the knowledge for their lives?* *Ans. Yes*	Negative believes even though not true can negatively influence IT adoption	Belief Effect on Adoption
21	**Conversion Factors - P - Effect of Awareness of ICT Potential - Informant 2 -** Comment: I really like that example of what you were able to do to change the thinking of the people about computers. *So would you say that awareness of the potential of IT, of what one can use IT to do can change the thinking and the beliefs of the community about computers?* *Ans. Yes. In a positive way it can change; it can greatly change.*	*Awareness of IT potential can positively change belief of the community on IT*	Awareness Effect on Belief

22	**Conversion Factors -P - Influence of Personal Conversion Factors on ICTs use - Informant 2 - Qn. And so for you from your experience, it seems to me that what one beliefs about IT can either block or hinder them from using it to better their lives or it can help/it can facilitate.** *Yes it can. It is just the negative belief about IT is what hinders them from engaging IT. Those who have positive view, they like it. I once had an old man who has a positive view about IT come and ask me to open for him a facebook account.* I then asked them, "Why would you want to be on facebook? Will you be able to understand and use Sheng [colloquial informal language used mostly by the urban youth of Kenya]? He answered and said, "No, I just want to learn about young people and how they behave on facebook so that I can teach my kids not to behave badly. *So he has some positive view that through IT he can change the lives of his children.*	***The belief about IT can either cause people to reject or accept IT use*** Positive view about IT can cause one to overcome age and discourse barrier and adopt trending IT *Belief - with IT one can change people's lives*	Effect of IT Belief Positive IT view Transformative IT Power
23	**Conversion Factors - P - S - Effect on ICTs - Informant 5** - Qn. *As for you, do you think those people who have gone as far a class eight or they dropped out of school can still get trained and use the IT knowledge in their lives?* *Ans. Yes, they can. It is what they think and believe that hinders them.*	*Education not a hindrance to IT Adoption* *IT adoption hindered in the community by negative belief*	*IT Adoption Hindrance*

24	**[Conversion Factor - P] - Informant 3 - Qn. At the time when you got exposed to this you were quite knowledgeable on electrical work and installation, you have a good level of education, you have very good command of English, you are a man. *I would like you to see how each of your talents, your characteristics, your experience, your life, your personality, things in you, things that you have, how this helped you identify the potential in IT.* { I ask this because there may be other people who are not educated, may be they do not speak English very well, maybe they don't have any other knowledge - like now you had professional knowledge, may be they are women who are stay-at-home mothers} So I'm trying to find out, with that background as George, if you think about the things that you have, your talents, your gifts, your abilities, your profession, your education - what in that helped you to clearly identify this potential in IT and run with it?** Ans. If we talk about the education, as for me I'm not that educated - I went up to standard seven in 1982, but I was not able to proceed with my education because of my family background, so I just moved to 'Jua Kali' [informal sector, with no formal training], learned to be an electrician [electrical fitting craft], but *due to my flexibility, due to my eagerness to learn, is what sounds to many as if I'm somebody learned. Due to my personal respect, and due to the way I learned to present myself to people, it sounds as if I'm somebody learned*. But to me, *I like to know what is happening in everyday life*. Even for ICT, I was very eager - after getting an explanation from Lawi Odongo, I was very eager to know much about this because I like to know something better - I lack words - but I like to understand things better before I can [migrate] from one place to another, I need to know it in a way that I can be able to explain it in case I'm being approached. So that's why I decided that besides doing electrical, because *people were telling me* - look George, y*ou are now aged, why are you going to class to learn - you are having to sit somewhere and learn.* But I *said no - I need to learn what is happening today, rather than sitting where I am*. So *it is just motivation - I just decided to get to know what is happening in the modern life*.	Personal attributes can influence desire to learn IT hence adoption Awareness of IT can create interest in IT *Individual inquisitiveness and Personal motivation can overcome negative discourse to adopt IT*	Personal Attributes and IT IT Awareness *Personal Motivation*

25	**Conversion Factors - P - Effect on ICTs Informant 1** **Qn. That is interesting - about the people in the village [Kogere] who are being taught, but at least they need a bit of literacy?** Ans. Yeah, *you need to be a little literate in some way ...because for people who are literate they don't struggle so much, because as you use the pointer to point at something [{i.e. as you put the pointer at say an icon}], it always tells you what to do [i.e. tool tip], and you now you can't translate what is there in vernacular so that those people can understand - it needs some literacy*, that one I see but for them may be for the illiterate they are just being told what to do, how to open it, there must be somebody to guide them , may be to get the information and then may be translate what is going on. But you need to have some understanding of the English language; if you have it, you will find it very easy as you work with the computer.	*Basic literacy can assist in IT training*	*Literacy*
26	**Conversion Factors - P / Conversion - Identification of Potential of ICTs Informant 1 Qn. What in you (your characteristics - e.g. being male, educated, having good command of English, etc) helps you to utilize that IT to get the things that you want to make your life better, in other words. Do you think the attributes (demograhics) of a person can affect their ability to utilize IT to better their lives?** Ans. *I can say that having the knowledge at a very tender age is important, it can make somebody to see a lot of opportunities more so from these localities, you may not be able to interact and see a lot of opportunities that are there, but if you can introduce this to the village, and now people have the knowledge they can come and see many opportunities* - they can browse, they can get connected to the world, you can even get a young kid, having a lot of information, having a lot of knowledge, seeing a lot of opportunities in future. If for that short time I get to lean about Industrial chemistry through the Internet and I was just surfing, and I saw that our country is planning to get industrialized in future and I knew they will need people with the knowledge of industrial chemistry and I said, God willing, if I get good results, I will go for this course, so that may be we will become the implementers of Vision 2030. So if we could get some 30 people from the village who have the knowledge of IT and they think along those lines, somebody thinks along another line, we realize that with time we shall better the future. So having the knowledge is very important and enables you to transform the whole society. *If you have the knowledge it is will open for you ways indeed. It will make you see whatever you were not able to see before.*	*Getting IT Knowledge at a young age will enable people to be aware of possible opportunities available through IT* IT knowledge enables you to transform the society - belief IT knowledge will open a way and enable you to see new things	Age Transformative IT Power IT as Access

27	**[[Conversion - ICT Role - Identification of Potential of ICTs]]/ Conversion Factors - P] Informant 1 Qn. From your experience, give your take on how someone is able to take this knowledge and utilize it and convert it to a better life, convert it to livelihoods, convert it to education or business. how is one able to take this knowledge and computers; how do they utilize them or convert them to make their life better. Things which improve their lives - that process - can you try and interrogate that process** Ans. I can say that after you getting this knowledge, the most important thing is you don't sit back with the knowledge, In deed computer is something if you learn today and you stay for five months without touching a computer, you will realize that as you come back you are having a lot of difficulties, may be to remember whatever you are supposed to do with that computer, *so after getting this knowledge, you plan with it, you plan whatever you are going to do with this package. So as you partake it you ask yourself, What will this one help me with? Having this knowledge, how will this help me?* And people have been earning livelihoods with this computer. Like you find others were not trained as teachers, but they learned computers, they are now teachers and they only step in class when computers are being taught. They attend classes only when they have lessons, but at the same time they have cyber cafe's and browsing, at the same time they offer photocopies. You realize that they are able to earn a livelihood. Nowadays when you have a function, you must make a program for that function - whether it is a wedding or a funeral , you can make it a better place, you have a the knowledge you have the , digital camera, you can be taking people's photos you may even produce passports for them, so this IT - it is very wide, you can connect with even people from around the world and get even a tender to do a job for them . There is a person who comes here, and when I interacted with him, he told me he works in the house, he sits in the house, he is working for a company in another country - he works over the Internet and that's how he earns his livelihood. He can even sit in his car and continue to earn a living. and that is a very admirable life - someone sits at home and continues to earn		Self

28	Conversion Factors - P /Conversion - ICT Role Qn - **Informant 4 -** Qn. Can I ask how your IT knowledge affects your access to resources like information, like education, like social interaction, like services; how has it affected your access to things that you like to do? Ans. *I can say it has affected me.* Like in education: *when I have a research to do or an assignment to complete, I'm not able to do it on my own - instead of taking time to think and try to do it, my mind doesn't want to do it - I just feel there is computer and I just find myself on Google, I look for the information and just do the assignment. I know that gives me limited time to read.* **So this make me depend a lot on the computer such that whatever you are given you find yourself turning to the computer. That I can say it has affected me** For my social networks, for example when I have a private issue to deliver, I can't post it in facebook - so may be through the email of the person, through Twitter, and if I can't access that message through the computer, I can use my phone.	*Computer has affected me* *Computer has affected way of working* **Computer dependence**	
29	**[ICTs - Training] - Informant 3 - Qn. After you learned about the training, what motivated you to come for the training?** Ans. As I have said, I just wanted to do things by myself. *You see, when you are typing a quotation, the terms you are using to describe our items is quite different. If you make a little change, you find that you make a different thing. For example it is a tender that needs to go to the board and there are people there who know what the tender is all about, if you make a little change it brings out something completely different from what you had intended. So I used to find these mistakes over and over again when I would have other people doing the typing for me; I sometimes would have to change the quotation that has been printed again and again. I decided that if I can type the quotation myself, I will avoid those type of errors. It is this desire to do things myself and avoid these type of errors that made me look for a place where I can learn computers and do things myself.* I therefore came and learned and now since I'm the one who does the quotation, these errors have been avoided.	*Awareness of potential of IT to enable every-day work motivated training attendance*	IT Potential Awareness Training Motivation

Appendix F: Emergent Concepts and themes – Case 2

	Emergent Concept – With Informant and Row)	Emergent Theme
1	*Discourse on IT* - Informant2 -1 *Negative Discourse* - Informant 4- 2 *Negative ICT Discourse* - Informant 1 - 10 Influence of opinion leaders on Discourse - Informant 6 - 15 *Effect of Discourse* - Informant 6 - *15*	*Discourse on IT*
2	Positive IT Belief - Informant 4 - 2 Belief about IT - Informant 6 - 3 IT Belief Effect - Informant 6 - 3 IT Belief and Interest - Informant 5 - 4 Positive IT Belief - Informant 1 - 5 Community Belief on ICT Informant 4 - 6 Community Belief Effect Informant 4 - 7 *Awareness Influences Belief* - Informant 3- 8 **Belief on IT** - Informant 3- 8 Belief on Internet Content - Informant 3 - 8 *Negative IT Belief* Informant2 - 13	Belief about IT
3	Effect of Belief on Adoption - Informant2 - 22 Belief Effect on Adoption - Informant 6 - 19, 20 *Effect on IT Attitude* Informant2 - 13	*Effect of Belief about IT*
4	*Illiteracy Effect on IT Belief* - Informant 3- 9 *Literacy Effect* - Informant 1 - 25	Literacy
5	Personal Attributes Effect - Informant 3 - 24	Personal Attributes
6	Age - Informant 1 - 26	Age