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The Practice and Need for Rural ICT for Development Evaluation: An Experience of the Siyakhula Living Lab Baseline Study

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Abstract

Information and Communication Technologies (ICTs) have been identified as essential tools in supporting rural development as information and knowledge are key strategic resources for social and economic development. A number of cases exist where ICTs are known to have beneficial effects in communities. However, there are also cases where ICTs have made little difference, or have actually worsened the development status in a rural community. The benefits and challenges associated with ICTs in rural areas need to be questioned in terms of the relevance and actual impact of such programmes on rural development. Fundamentally, development organisations should be aware of the need for evaluation and its significance for ICT projects that aim to support development. On the other hand, ICT projects that have attempted to implement evaluation frameworks are also confronted with shortcomings and challenges which influence the reliability of evaluation conclusions. It is essential that these shortcomings and challenges are understood, so as to improve existing evaluation frameworks, and/or to develop frameworks that more effectively address them. A Baseline Study of the Siyakhula Living Lab in the Eastern Cape of South Africa presents an example of an evaluation approach of the first stage of an ICT project evaluation. The practices applied and experience illustrate the benefits and challenges associated with conducting this evaluation approach.

Keywords: evaluation, rural development, Living Lab, information and communication technology

1. Introduction

ICTs are known to have social and economic benefits in rural communities as information and knowledge are key strategic tools for development. However, there are cases where the implementation of ICT projects has actually not made a difference, or the effects have been harmful in communities (Buré, 2007; Gomez and Hunt, 1999). Accordingly, debates have arisen with growing scepticism about the usefulness of ICT for development, given significant evidence of failure and a wastage of resources linked to sudden massive implementations of ICT projects in developing countries, with the hope of promoting development and alleviating poverty (Musa, 2006). Moodley (2005) emphasizes that governments and development organisations need to understand that the role of ICTs as powerful tools to fight poverty are, at best, a “working hypothesis”. Many key questions associated with ICT for development (ICT4D) remain largely unanswered, with no concrete or credible data to support a wide range of claims concerning the use of ICT for development (Buré, 2007; Wagner, Day, James, Kozma, Miller, and Unwin, 2005). The evaluation of rural ICT projects is indispensable as it determines the need, effectiveness, impact, sustainability and extent of the awareness of the contribution such projects or programmes can make in poverty alleviation and development. This research paper examines the fundamental needs for rural ICT evaluation and the shortcomings that it is confronted with, and presents the Siyakhula Living Lab Baseline Study to explore the practices applied and experienced in an attempt to conduct an effective evaluation. It is concluded that the concept of *programme evaluation* needs to be understood as it provides a guideline for developing a comprehensive framework that addresses and considers the shortcomings and challenges of current ICT4D evaluation.

2. The Need for ICT4D Evaluation

A variety of needs exist for the evaluation of rural ICT projects. The needs identified are an on-going phenomenon with the growing implementation of ICT projects in different contexts, and with different development goals. In order to understand the need for evaluation, it is important to have a good understanding or definition of what evaluation comprises. This research adopts Rossi, Lipsey and Freeman’s (2004) definition on *programme evaluation*, where evaluation is defined as: “*The use of social research methods to systematically investigate the effectiveness of social intervention programs in ways that are adapted to their political and organisational environments and are designed to inform social action to improve social conditions*”. From the above definition, it is evident that evaluation encompasses a number of aspects, which the concept and subject area of programme evaluation can elaborate. Four key aspects describe the process and purpose of programme evaluation, that is, the adoption of social research methods, the need to evaluate the effectiveness of programme interventions, the need to be sensitive to the political and organisational context of the programme, and lastly, the purpose of informing social action to improve social conditions. This concept and structure of programme evaluation can play a fundamental role in shaping ICT4D evaluation frameworks to conduct an effective evaluation in rural environments.

Over the past few years, with the increasing emergence ICT for Development (ICT4D) projects, the focus of evaluation has changed. According to Heeks (2007), interest in different aspects of the ICT4D value chain have changed over time, where a strong diffusion of such projects have created more particular interest on *impact assessment*, as opposed to uptake, availability, or readiness (Figure 1).

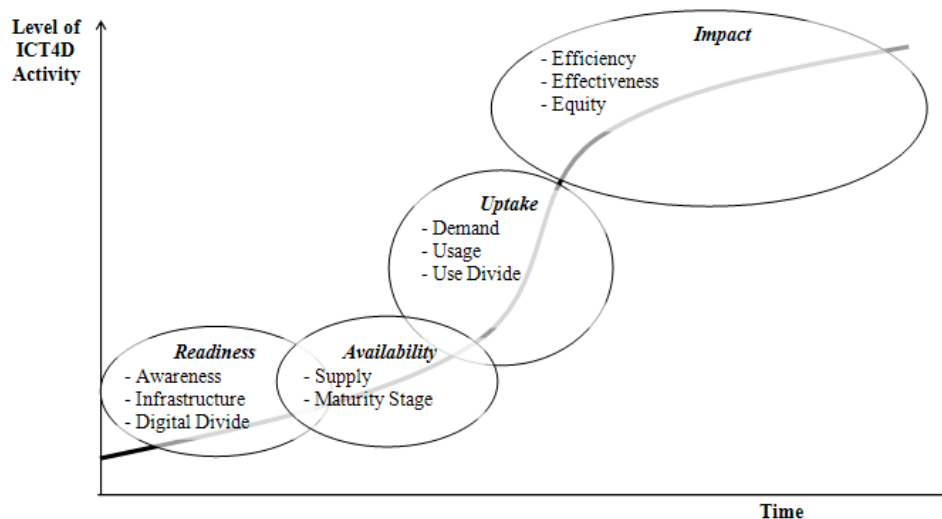


Figure 1: Changing Focus of ICT4D Assessment Over Time (Heeks, 2007)

However, some authors such as Rossi *et al.* (2004), and Babbie and Mouton (2001), may argue with this particular focus of ICT4D evaluation, as the evaluation of impact is best developed based on the evaluation of previous aspects of the project at different stages of its life. Therefore, the evaluation of uptake, availability, readiness, and process are equally important and should be linked. The key needs for the evaluation of ICT4D projects identified in literature are discussed as follows.

2.1 To Understand the Impact of ICTs

A growing need exists to understand the impact of ICTs on development, and Batchelor and Norrish (2006) indicate that there is still little rigorous understanding of the condition for success associated with these innovations. Rigorous impact evaluation is needed to understand the role that ICTs play in all sectors of social and economic development, and how well they respond to information and communication needs (Batchelor and Norrish, 2006; Whyte, 2001). Knowledge exists as information that can be structured into concepts and facts to accomplish some development purpose (Whyte, 2001). Consequently, within a specific knowledge context, it is necessary to examine the use and impact of information, so as to judge whether it is relevant, timely, understandable, and of practical benefit to individual users in the community.

An impact assessment, in most cases, is based on the pre- and post situations of the ICT intervention (Wakelin and Shadrach, 2001). This is known as the 'before' and 'after' approach, and is only effective if the objectives set are correct and appropriate. If not, the approach only identifies changes that occurred from the ICT programme, but not how they have occurred and why. The 'how' and 'why' aspects of impact assessment play a significant role in informing decision making associated with new and emerging ICT projects.

2.2 Mainstreaming ICTs

Trade-offs exist between social and economic programmes that support development, and governments and development organisations need to strategise and decide which programmes are most relevant and best meet the development needs of a community or country. Batchelor and Norrish (2006) explain mainstreaming of ICTs as follows: "Mainstreaming involves not only subordinating ICT to broader strategies and goals, but also more effectively navigating the trade-offs between ICT and other interventions in resource-poor environments and the links between ICT interventions and other elements of broader sectoral strategies (in education, health, rural development etc.)". Investment in ICTs for development means investing less in other development priorities, such as water, sanitation, health, education etc (Wakelin and Shadrach, 2001). Evaluation of ICT4D programmes is fundamental to demonstrate the usefulness of ICTs in acting as change agents that complement other development sectors associated with poverty alleviation and sustainable development. Rigorous evaluation reports of ICT project performance helps to inform and guide effective public policy and programme planning (Garrido, 2004).

2.3 Assessing ICT Pilot Projects

Rural environments and poverty challenges are complex and dynamic; therefore it is essential to initially implement pilot projects to test the feasibility, relevance *etc.*, of such projects. ICT projects that aim to support more than one rural development activity should initially implement the project in smaller components at an experimental level to realise the actual benefits and feasibility of using the technology in particular rural environments (Pade, 2006). Bachelor and Norrish (2006) stipulate that ICT pilot projects need to be evaluated to ensure that they are working effectively to achieve their purpose, including their contribution to wider development priorities, and also to demonstrate how it may be scaled for future implementation. Taking a pilot project to scale is rarely straight forward, and requires a broader understanding of enabling conditions, and what the impact may be if it is brought to scale.

2.4 Promoting Community Awareness of ICTs as Change Agents

Evaluation from the start of a project can create awareness of the relevance and use of ICTs in a community, which is essential for community buy-in. For instance, Buré (2007) indicated that community participants in an evaluation exercise for telecentres in Ecuador and the Philippines appeared more organised and passionate about using and encouraging others to use the telecentres. Therefore, applying a bottom-up approach through community participation in an evaluation can promote awareness of the ICTs, as the results of the evaluation become more relevant and applicable to community members. Hudson (2001a) explains how a baseline evaluation for an ICT project raised awareness of a telecentre in a community. The baseline evaluation, served as a form of market research through identifying, community information needs, training needs, preferred hours of operation, and a willingness to pay for services. This provided a means of improving rural ICT projects, and the likelihood of long-term sustainability (Hudson, 2001a).

2.5 Promoting Awareness of Community Needs and Local Context

While it is important for a rural community to be aware of the potential of ICTs as change agents, it is also essential for external stakeholders to be aware of community needs and the local context. ICT projects are required to work with local needs, especially considering demand driven needs in accordance with the assessed requirements for information and services (Gigler, 2004). Different communities operate in diverse local conditions, based on the needs and desires of the people, and the factors (economic bases, cultures, social organisation, *etc.*) that influence their uptake of technology (Keniston and Kumar, 2003). A project should conduct a thorough needs assessment that determines the requirements of particular communities, thereafter adapting the technology to suit and serve their needs (Keniston and Kumar, 2003). Otherwise, ICT projects imposed on a community that has not independently determined a need for it are more likely to fail or not be sustainable.

Baseline studies have been used to establish yardsticks for key indicators of community-related variables and needs that the project is expected to influence (Gomez and Hunt, 1999). Establishing key project objectives based on the variables and needs provides a good foundation for conducting an effective impact evaluation of a rural ICT project.

2.6 Research Guidance for Future Innovations

On-going rural ICT initiatives guide future investments in similar initiatives through documenting and applying lessons learned (Garrido, 2004). Research is important to develop appropriate methodologies and frameworks that are sensitive to local requirements, challenges to ICT use, and critical success factors that lead to long-term sustainability. According to Garrido (2004) a collaboration of universities and research institutes provide a fertile ground for the generation of knowledge and scientific know-how to contribute to advancing and shaping part of the intellectual agenda of ICT for development. In this case, systematic research approaches which are multidisciplinary, comparative and multicultural contribute to research on social, economic, and political evaluation aspects associated with rural ICTs.

2.7 Assessing Project Process Management

Rural ICT projects should be monitored and evaluated to demonstrate good project management, learn lessons for future projects, and show that there is accountability for the implementation process (Gigler, 2004; Myers, 2005). For instance, Pade, Mallinson and Sewry (2008) propose a Rural ICT Project Life Cycle (RICT-PLC) model which comprises project management techniques associated with the critical success factors for rural ICT project sustainability. The phases across a rural ICT project life cycle should encapsulate the critical success factors of

sustainability that are sensitive to the complex rural environment. The extent to which appropriate project practices apply these factors may reveal the potential sustainability of a project in a rural area.

2.8 Igniting Confidence among Stakeholders

Evidence of successes in different rural ICT initiative evaluations can ignite confidence among key external stakeholders (Garrido, 2004). Evaluation results can bring together different stakeholders, especially in cases when decisions need to be made about projects which compete for limited resources. The private sector and non-profit organisations are aware of the potential benefit and influence of ICT in poverty alleviation and development, but are also concerned of the limitations of affordability and accessibility (Batchelor and Norrish, 2006; Wakelin and Shadrach, 2001). Evaluation is necessary to show that ICTs can support solutions for poverty alleviation and sustainable development in various sectors of the rural economy. In addition, a baseline study can provide an understanding of the distribution of affordability and accessibility in a community, and how best to manage these challenges throughout the implementation and on-going operation of an ICT project or programme.

3. The Shortcomings and Challenges of ICT4D Evaluation

It is evident that the need for evaluation is fundamental for ICT4D programmes or projects. The growing implementation of such projects has resulted in the development of a number of evaluation frameworks to account for the programmes implemented in various contexts (rural or urban) and development targets (education, health, empowerment *etc.*). Examples of such evaluation frameworks include the Framework for the Assessment of ICT Pilot Projects (Batchelor and Norrish: 2006), Berkeley Roundtable Rural Telecentre Impact Assessment Framework (Rothenberg-Aalami and Pal, 2005), Alternative Evaluation Framework based on the Capability Approach (Gigler, 2004), the Acacia Evaluation and Learning System for African Telecentres (Hudson, 2001), Stories Evaluation approach for community based ICTs (Harris, 2001), Gender Evaluation Methodology (Buré, 2007). ICT4D evaluation is faced with certain shortcomings and challenges which influence the accuracy and relevancy of evaluation results. It is important that these shortcomings and challenges are understood, so as to improve existing evaluation frameworks, and/or develop frameworks that more effectively address them. The following shortcomings and challenges have commonly been identified in the literature.

3.1 Accounting for Unexpected Benefits

The results and impact of rural ICT programmes can have both intended and unintended outcomes. Normally, donors and funders desire post-project evaluation reviews to focus on measuring whether a project has delivered on its targets, without necessarily exploring other unintended impacts that may have emerged along the way (Wagner *et al.*, 2005). ICT pilot projects have failed to produce expected benefits fast enough to satisfy funding agencies, but instead have produced unexpected results which evaluators can have difficulty accounting for, if not considered in pre-evaluation planning (Harris, 2004). Wakelin and Shadrach (2001) suggest that in order to obtain a broader picture of development, assessments need to take a longer-term view, which observes intended and unintended benefits across a variety of rural livelihood concerns. For example, it could be that an ICT programme for improving the education performance in a rural school has had an insignificant effect, as measured by the examination system, whereas learners and teachers may have actually gained other skills and knowledge from the programme (for example, access to other educational information, communication with learners and teachers from different countries) (Wagner *et al.*, 2005). In this case, the latter impact may be missed entirely in an evaluation that does not account for unintended benefits or outcomes.

3.2 Sensitivity to Rural Contexts

Rural contexts encompass a variety of social and cultural factors which are interdependent. Evaluation frameworks need to be sensitive to these diverse and dynamic factors. It can often be a shortcoming of evaluation to concentrate on more direct technological factors associated with the community's interaction with technology, such as, access and usage. However, evaluators need to be aware of other anthropological dimensions of rural ICT interventions, especially those in multi-cultural societies (Wagner *et al.*, 2005). Consequently, monitoring and evaluation needs to be refined to suit local needs and cultures as ICT technology is not culture-neutral. Although there is no singular 'best approach' to evaluation, a flexible approach that recognises cultural specificities is essential for ICT evaluation to be effective in a variety of rural contexts (Hollow, 2007).

3.3 The Diversity of Indicators Required

The dynamic rural environment and the variety of objectives associated with ICT4D projects require an evaluation to consider a diverse collection of indicators to assess effectively a rural ICT project. Indicators are central to any evaluation and are defined as measuring devices or a piece of information which “communicate a certain state, trend, warning, or progress of a project, hence defining what data to collect and at what time intervals” (Rothenberg-Aalami and Pal, 2005). The common shortcomings and challenges of selecting and using appropriate indicators in ICT4D evaluation are as follows:

Data gaps in ICT4D assessment, at times make it impossible to create indicators using standard international formulae. Such shortfalls result, for instance, from data not collected in the required way by national statistical agencies, private ICT providers who are unwilling to release strategic business data into the public domain, or the scarce supply, and poor relevance of data. (Menou, 2001; Thlabela, Roodt, Patterson, and Weir-Smith, 2007).

Evaluation indicators need to be based on *local* indicators of impact. A critical problem identified by Rothenberg-Aalami and Pal (2005) in telecentre evaluation is that they tend to lack uniformity in the kinds of issues analysed. Some indicators are either not easily measured without context, or simply impossible to measure. In this case, evaluators need to understand better the regions or contexts in which they conduct an assessment.

The selection of ICT indicators can at times exclude traditional ICTs such as television, radio, and the telephone, even though these are still key modes of communication in rural areas. It can be difficult to measure a community’s opinion on ICT programmes if they have little media choice (Myers, 2005; Wagner *et al.*, 2005). Considering all technologies provides a clearer view of ICT influence, the gaps of local communication and information, and the potential to integrate modern and traditional ICTs.

Most impact evaluations have excessively focused on objective quantitative issues, for example, how many people accessed, what technologies are used, *etc* (Wakelin and Shadrach, 2001; Hollow, 2007). However, evaluations also need to consider human livelihood issues that are subjective in nature, and best assessed qualitatively. A qualitative approach promotes community participation through dominantly adopting a bottom-up approach to assess community needs and project impact on targeted individuals and groups. Nevertheless, a mixed approach that considers both quantitative and qualitative methods should be applied for a more in-depth evaluation (Hollow, 2007; Harris, 2007; Rothenberg-Aalami and Pal, 2005).

3.4 A Lack of Direct Community Participation in conducting the Evaluation

It is often assumed that external evaluation experts can independently and effectively conduct an evaluation in a specific community (Hollow, 2007). Tools, procedures and even results of the ICT evaluation are often meant for specialists (Menou, 2001). As a result, the community is only exposed to interpretations made by key actors in the techno-structure or the media, with little to no contribution or involvement by target audiences. Wagner *et al.* (2005) indicates that “few studies actually take into consideration or report the attitudes and opinions of the end-beneficiaries of ICT-based educational initiatives”. Consequently, these initiatives may actually end up not meeting the needs and priorities of communities. A rural environment encompasses a variety of aspects, which are not directly evident to specialists that do not reside in a community. A broad range of appropriate stakeholders are fundamental for identifying suitable and pragmatic monitoring and evaluation techniques (Wagner *et al.*, 2005; Whyte, 2001). At local level, key target groups or gate keepers in the community need to be identified, and an effort should be made to understand the anticipated outcomes associated with each group. Community members can provide evaluators with false information if they feel the project may be taken out of the community once the challenges or barriers they face become more evident (Pade, Mallinson and Sewry, 2007; Wagner *et al.*, 2005). However, if the evaluator works closely with community members and encourages participation, they become more aware of the purpose, need, and benefit of conducting an evaluation of the rural ICT project.

Wakelin and Shadrach (2001) distinguish between Donor-focused conventional evaluations and Beneficiary-focused participator evaluations, as shown in Figure 2. Conventional approaches make evaluations Donor-focused, without being sensitive enough to the context the ICT project is applied, hence not providing sufficient interaction to effectively conduct an evaluation. Community participation, allows for better interaction in the evaluation process, hence producing relevant and useful results, and encouraging beneficiary-focused participator evaluation.

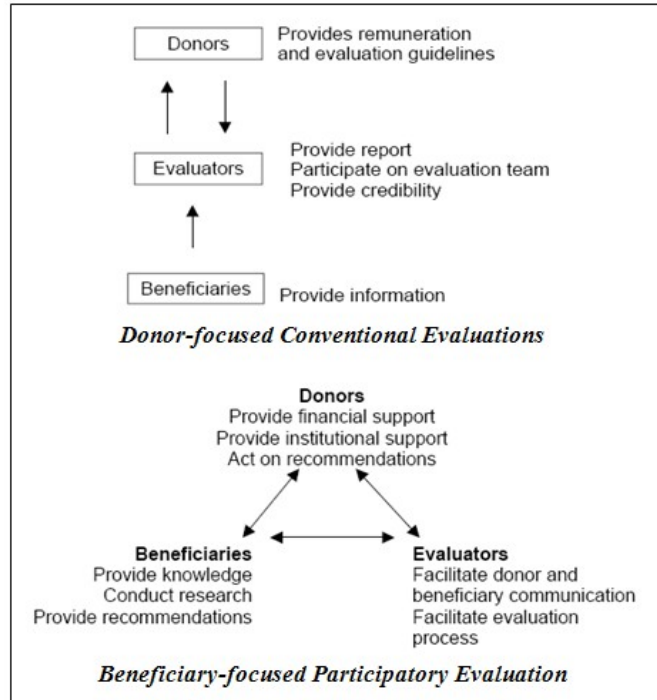


Figure 2: Comparing Conventional and Participatory Evaluation (Wakelin and Shadrach, 2001)

3.5 Evaluations that are Political and Subjective

Evaluations are not free from the problem of subjective and political perception (Rosas, 2005). Evaluators can simply apply their perspective from their expertise, but overlook certain methodologies and frameworks that make the evaluation more accurate and relevant. The evaluator needs to make every effort to conduct an open and participatory evaluation, so that he/she may be more accountable for their decisions. It is also difficult to conduct evaluations in highly politicised areas and places of conflict (Myers, 2005; Rosas, 2005). An evaluator can be influenced by political perspectives, in order to satisfy certain stakeholders that fund the evaluation. Evaluation initiatives may remain uninteresting in some developing countries, unless they provide some sort of political benefit (Rosas, 2005). As a result, evaluations that are performed based on political criteria and positivist approaches tend to show a more deterministic view of technology – if more people have access to the internet, then there is development. However, from the previous discussions, it is obvious that rural ICT evaluations should encompass more than only a technology focused view.

3.6 Insufficient Funding and Resources to Conduct Evaluations in Developing Countries

Rural ICT evaluations require increased budgets, time devoted, and evaluation skills, which do not come cheaply (Rosas, 2005; Wagner *et al.*, 2005). Sufficient funding for ICT4D evaluations is a challenge in developing countries, as there is limited money or will to conduct evaluations that usually do not have direct or evident impacts from the beginning of implementation; or even, a political benefit. A sufficient budget for monitoring and evaluation should be established from the start of a project (Wagner *et al.*, 2005). If not, it becomes a challenge for evaluation implementers to spend their time searching for additional resources to continue conducting the evaluation, hence detracting them from proposed evaluation activities. Furthermore, if funding becomes tight, some project stakeholders may be tempted simply to cut costs by cutting monitoring and evaluation (Wagner *et al.*, 2005).

The outcomes or impact of ICT4D evaluation can occur at various levels or across scales, from individual, to household, group, community, regional, national, and international levels (Harris, 2007; Rothenberg-Aalami and Pal, 2005). This presents a challenge to evaluators as their scope of evaluation can be restricted by narrow perspectives, insufficient tools, or limited resources. Furthermore, conducting a national survey to collect the desired data can be extremely expensive, and there may be no private or NGO organisations with available resources to collect such data (Thlabela *et al.*, 2007). Evaluators need to plan appropriately and select viable levels, scales or approaches to conduct an effective evaluation.

3.7 The Time-dependent Nature of ICT4D Programmes

Evaluations need to take into account that many changes or impacts brought about by ICT initiatives are long-term and often indirect (Buré, 2007; Wagner *et al.*, 2005; Myers, 2005). ICT4D initiatives are a form of human development infrastructure, which therefore makes evaluation highly time dependent. Often, the time-scales required for communities to fully appropriate and use ICTs exceeds the expectations of promoters and evaluators who become impatient and incongruously declare projects as failures too early in the project's life (Harris, 2004). Heeks (2007) indicates that this has been a classic impact assessment failure, as projects are assessed too early and usually at a pilot stage when it is not operating at a full-scale level in the community.

The misconception lies between defining an ICT4D initiative as a *project*, rather than a *process*. Harris (2007) explains that telecentres are commonly viewed as projects with defined beginnings, middles, and endings, resulting in the development of pre-defined outcomes. However, rural communities view ICT4D initiatives as a process in which (Harris, 2007): “...*learning proceeds through multiple stages, each one building on the previous, until the technology is appropriated by them and new problems and opportunities are addressed progressively in a manner that adapts to the accumulated experience and shifting priorities*”. Rural ICT projects in this case, need to be iterative in nature, hence allowing an ICT project to be built on increasingly throughout its progressive development (long-term), considering changes in the rural environment (Pade, 2006). Within the iterative process, evaluators should systematically document changes and identify impacts that result over time, and also consider barriers that could hinder long-term impacts (for example, a lack of funds, community despondency, sustainability issues *etc.*) (Hudson, 2001b). ICT evaluation therefore needs to invest in longitudinal studies that result in reliable and relevant conclusions.

3.8 Not considering all Stakeholders

A rural ICT programme consists of internal and external stakeholders that show an interest in the success or sustainability of a project. External stakeholders include funders, project managers, the project implementation team, government, other development organisations *etc.* Internal stakeholders consist mainly of individuals in the rural community, or the community as a whole, which the ICT project aims to target. It has often been the shortcoming of ICT4D evaluations to concentrate on evaluating internal stakeholders, especially with regard to the impact the ICT project has had on their livelihoods. However, key external stakeholders such as funders and project managers who make essential decisions should also be evaluated as the initial decisions they make and approaches they apply will eventually contribute to rural ICT impact. Wakelin and Shadrach (2001) therefore advise that evaluation should look beyond target beneficiaries and consider *all* stakeholders.

3.9 No direct and Causal relationship between ICT and Poverty Alleviation

A development change in a rural community may not always be clearly linked to an ICT programme, as there may be other social, economic or political factors that may have contributed to the change (Myers, 2005). This makes it difficult to measure impact where there clearly is no direct causal relationship between ICT and poverty alleviation. According to Gigler (2004), the majority of ICT evaluations have focused primarily on ‘access’ and ‘usage’ hence assuming improved ICT access will have a direct positive influence on community development. However, a number of factors or indicators come in to play when assessing rural ICT programmes. Gigler (2004) defines the ICT and poverty relationship as more complex and indirect in nature whereby: “...*the issue of the impact on the livelihoods of the poor depends to a large extent on the dynamic and iterative process between people and technology within a specific local, cultural and socio-political context*”. Evaluators therefore need to design their evaluations appropriately to capture rural development impacts or aspects that can be linked to ICT initiatives. On the other hand, ICT initiatives are best implemented when they support an existing rural development project or programme. Therefore, ICT impact could possibly be measured based on the objectives of rural development programmes.

The need for evaluation is fundamental to ICT4D; however, emerging evaluation frameworks are confronted with shortcomings and challenges which influence the effectiveness of ICT4D evaluations. A real-life case study example of the Siyakhula Living Lab Baseline study illustrates the benefits, challenges, and lessons learned in appropriating an introductory evaluation approach for an ICT4D project.

4. A Case Example: A Presentation of the Siyakhula Living Lab Baseline Study

The Siyakhula Living Lab (SLL), previously known as the Siyakhula ICT project, has in 2009 adopted the Living Lab concept in collaboration with Rhodes University, the University of Fort Hare, COFISA (Cooperation Framework on Innovation Systems between Finland and South Africa), the Meraka Institute and the Nokia Siemens Networks. It exists to provide new technology and skills to the rural community of the Mbashe municipality, specifically in Dwesa on the Transkei coast. It was launched in 2005 as a collaboration between the Centres of Excellence at the University of Fort Hare and Rhodes University. Siyakhula is a Xhosa word that means 'We are growing', as the project would desire: it aims to grow in its innovation and sustainability. The SLL, since its inception in 2005, has been running in five schools that are its base in the community. These schools are Mpume Junior Secondary School, Ngwane Senior Secondary School, Mtokwane Junior Secondary School, Nondobo Junior Secondary School and Nqabara Secondary School.

The primary objective of the SLL is to develop and field-test a distributed, multifunctional community communication platform, to deploy in marginalised and semi-marginalised communities in South Africa, where a large number of the South African population live. The second objective of this project is to equip people with technical skills in the field of e-commerce particularly (but by no means only to support e-commerce activities). Tertiary level students will also gain skills through exposure to the processes of applied research and by experiencing actual ICT projects in their area. This second objective in turn supports the first.

The SLL platform was originally designed to support the marketing of local arts, craft and eco-tourism through e-commerce. It now includes a number of additional features pointing to new sub-projects. Local wireless connectivity and connection to the Internet are good supports for e-health, e-government and e-learning. Building up a local force of skilled ICT users and further ICT training in the area are basic to the Living Lab's programme. Examples of other sub-projects include software engineering of a robust, cost-effective e-commerce platform for disadvantaged communities; an assessment of adoption barriers to ICT; project management techniques for sustainable rural ICT; and backhaul connectivity options for ICT deployment. Collaborating on these sub-projects widens the vision of the Living Lab, adds to its goals, and deepens its support for rural development in the Mbashe municipality.

The focus of service delivery so far has been via desktop computers and fixed line telephony. There is a move, however, to extend to cellphones. With this in mind, the SLL will pilot the Nokia Siemens Networks Village Connection platform, which offers affordable voice and SMS services specially designed for rural communities. The technology provides an addition to GSM networks and extends coverage beyond the point at which a conventional network rollout would be too expensive. The SLL baseline study serves the initial stages of the Village Connection project by informing all stakeholders of the current status of the community. It should then be possible to develop and implement the project appropriately, with good awareness of the livelihood needs and challenges of the community. The research questions that have guided the activities to fulfil the objectives of the Baseline Study are as follows:

1. What is the status of the local economy and what directions can it take?
2. What is the quality of life in the communities?
3. What is the readiness of the communities to be or become partners?

4.1. The Baseline Study Evaluation Process

The Baseline Study research approach was developed jointly by departments at Rhodes University and Fort Hare, with industrial input from Nokia Siemens Networks. The Baseline Study Research team consisted of the following individuals and expertise: Caroline Pade (Information Systems), Robin Palmer (Anthropology), Hannah Thinyane (Computer Science), Mitchell Kavhai (Communications), Sibukele Gumbo (Computer Science), Handsome Mpofu (Computer Science), and Stephan Martin (Nokia Siemens Networks in Singapore). The baseline study process was divided into two focus areas: 1) A socio-economic assessment of a sample community, 2) An assessment of current users of computers in the community.

4.1.1. The socio-economic study

The socio-economic assessment was conducted in a village in Dwesa that is representative of the rural area. Mpume was chosen as the sample site for the following reasons:

- Mpume is the first village where the ICT project was implemented, and hence has been operating in the community for the longest period.
- Mpume has focused more on a broad training of residents, unlike other villages where it is mostly just the teachers and students who have been trained.

- A training register showed that a number of residents had received some form of computer training already
- Mpume is more representative of the challenges that can be faced when implementing such a project, and would provide an ideal learning experience.
- The project team had formed good community ties, and had the support of influential project champions.

The data collection process was divided into two stages. First, a survey was conducted using a socio-economic questionnaire to assess all Mpume households. The second stage followed on a filtering process of the first stage to select appropriate representatives of the community for an in-depth qualitative investigation.

Stage 1

The baseline study aimed at being participatory so as to assess the community and their needs appropriately. The first stage began with a community meeting to introduce the baseline study and encourage community participation in the interests of producing relevant, context-sensitive results. The research instrument used was a *questionnaire* to assess socio-economic and technology adoption/readiness factors in the community. The questionnaire which consisted of both quantitative and qualitative (open-ended) questions was developed to survey all Mpume households. Although, the baseline study team had initially planned a sample of just 40 households in Mpume, the community asked at the meeting that each household (approximately 80) be interviewed, as they each believed they had different views and experiences to share. The study therefore applied a *bottom-up* approach to elicit the information needs of the community. In this case, three local residents were selected, with the assistance of one of the local project champions, to conduct the survey of all the Mpume households. The baseline study team trained the four people to conduct the survey appropriately, and the local project champion was chosen to lead the survey locally. It was later discovered that the Mpume community is estimated to have about 102 houses, but some of these are currently unoccupied – the assumption is that their owners reside outside Dwesa. The local team therefore conducted a survey of 80 households, which is a more than adequate representation of the occupied households in Mpume.

Stage 2

This stage aimed at more focused discussions to generate qualitative data. Data from the stage 1 survey were used to guide and probe discussions in the focus groups. Three main research instruments were used: *interviews*, *focus groups* and *participant observation*. Appropriate representatives of the community were chosen to take part in the discussions, as follows:

- **People involved in Arts and Crafts:** The arts and crafts people are one of the key groups who have the potential to benefit from tourism through the Dwesa nature reserve, and have shown direct interest in attempting this.
- **The Youth:** Here the aim was to understand how they saw the status of the community and what aspirations they had; especially how they felt they could make a contribution to the community, what changes were needed, and what would encourage them to stay in the community, considering a number of them planned to leave.
- **The Elderly:** The elderly have the longest experience of the community and developments, and were particularly asked about emerging challenges or problems.
- **Teachers:** They gave their perspectives on the status of the community and on local education needs.
- **Unemployed:** They also gave their perspectives on the status of the community, and especially helped with their explanations for local unemployment.

The following interviews were conducted:

- **The clinic nurse:** She had a clear understanding of the health challenges and needs in the community (face-to-face interviews).
- **Migrated workers:** Their views provided insights on why they left, their information and communication needs, and what they would like to see change in the community to encourage them to return to the community (telephone interviews).
- **Employees of the nature reserve:** In the event, there was only one person living in Mpume who actually worked in the nature reserve (face-to-face interviews).
- **A breadmaker:** This woman was one of the few self-employed residents in the community. She represented a group who jointly own and run a bread-making business in the village (face-to-face interview).

The project team worked closely with the community project champion, to choose participants for the focus groups. The first day of the trip was spent visiting various households to invite certain villagers to attend the focus groups. In the end, the Arts and Crafts, Youth, and Unemployed groups were interviewed together in one session due to logistical constraints. They were combined appropriately, though, given their characteristics. For example, the Youth focus group was combined with the Unemployed because most of the unemployed in Mpume are the youth.

4.1.2. An assessment of local computer users

The Siyakhula Living Lab has been implemented in five different villages, at particular schools that met the criteria for inclusion. The baseline study thus also ran an assessment of people in the Mpume community who had already received computer literacy training and the general impact of the project; the findings revealed fresh areas needing further research, which SLL plans to carry out. The research instrument used was a *questionnaire* for those who had received some computer literacy training from the initial project stage. Some team members have suggested the survey be conducted at all villages. This will form part of the future research agenda for SLL.

4.2 Analysis of the Baseline Study Evaluation Process

The process applied was beneficial to the baseline study which aimed to be relevant and effective in the rural environment. It was also confronted with challenges which contributed to lessons learned for similar evaluation or research endeavours in ICT4D evaluation.

4.2.1 Advantages

Applying a user-centric approach: The Living lab encourages user participation and collaboration. The baseline study opted for a user-centric method, collaborating with the community to decide on an appropriate approach for collecting baseline data to assess the current status of the community. The baseline study team accepted the community meeting's preference to have all households surveyed, for the widest range of perspectives. Four local youths were trained to help conduct the survey. The focus groups discussions and interviews were also highly inclusive in assessing the community's views of the current status of the community and former Siyakhula ICT project. The nature of the relationship that already exists between the community and the universities further promoted community participation and collaboration. This advantage attempts to address the following ICT4D shortcomings: sensitivity to rural contexts; and a lack of direct community participation.

Diverse research views: The baseline study team consisted of individuals with different and relevant research backgrounds. These included information systems, anthropology, communications, computer science, and Nokia Siemens research. This range contributed to producing a baseline study that would address the three research questions from a wide spread of research views. For instance, information systems, communications, and computer science linked the socio-economic status to the technological readiness of the community in terms of information needs and existing communication patterns; anthropology provides a people centred approach for assessing the social economic status and quality of life of Mpume. Lastly, Nokia Siemens Networks provided a perspective on essential factors that should be assessed to determine the status of cellphone use in the community. This advantage attempts to address the following ICT4D shortcomings: the diversity of indicators required; no direct and causal relationship between ICT and poverty alleviation; and sensitivity to rural contexts.

4.2.2 Challenges

Surveying every household in Mpume: The community requested that each household in Mpume should be surveyed, which posed a challenge to the team initially, due to resource and time constraints. However, it was essential that the survey presented the community's views suitably and respected their request, believing that they knew best how to portray the community's status. It was also on this basis that it was decided to train four youth members who reside in the community to assist in conducting the survey, which proved to be a success.

Data collection challenges: Six focus groups were targeted for the baseline study. However, one of the focus groups, Arts and Crafts, attended their meeting two hours late, and we therefore had to combine them with the Youth and Unemployed groups. These two latter groups had already been combined because most of the unemployed in Dwesa are the youth. The views of the Arts and Crafts group were at times similar to those of the youth, but there were differences on some topics. The research team opted to group or separate comments as appropriate.

Time constraints: Members of the team also had other research (PhD and Masters theses) and departmental commitments, which proved a challenge in completing the baseline study in a short period of time. In addition,

during the year, new experimental/untried research approaches had to be developed which would suit the rural and Living Lab context. Nevertheless, in the end the team were better equipped to carry out the baseline study, which has proved a good learning experience for all, including the community itself.

The challenge of eliciting the needs of the community: Eliciting information needs during the focus groups discussion was not a clear-cut exercise. The community is not always particularly aware of what their *information* needs may be, even though it is quite evident that there is a great need for information in rural development. Nevertheless, it has been suggested (Mulder, Bohle, Boshomane, Morris, Tempelman and Velthausz 2008) that rich insights can be gained for understanding a rural community through eliciting what they *value* and *challenges* in the community that they are more familiar with, rather than focusing on the potential of innovation and technology. Information needs were therefore elicited from what was said; and from there, it was possible to understand the kind of information that people would want to share with nearby villages, around South Africa, and globally. This 'Value-Challenge' approach proved to be useful compared to simply asking 'information need' questions.

4.3 Future Agenda of the Living Lab Evaluation Process

The baseline study forms the initial part of the ongoing evaluation of the Siyakhula Living Lab. Three stages of evaluation are proposed, to be implemented from the start of the project to its conclusion:

Stage 1 The baseline study, which has assessed the current status of the community.

Stage 2 A process assessment, to start when the Village Connection component of the Living Lab is up and running. This will gauge delivery in terms of, for instance, the programme's activities, performance, component parts, resources, and stakeholder relationships (the private sector, universities, government and funders). In addition, an elaborated needs assessment should be done to elicit specific information needs for particular development programmes, as well as to capture demand-driven needs that arise as the community becomes more involved in the development and use of Living Lab innovations.

Stage 3 An impact/outcome assessment will be needed when the pilot project turns into a sustainable commercial service (and if, against all likelihood now, the project does not do so, the assessment will still show what went wrong and so aid further planning). Direct and indirect effects of the Living Lab on people's livelihoods will be assessed. This assessment will also aim to identify a 'technology adoption' path of least resistance for rural areas and determine how best to implement such projects in rural areas.

5. Conclusion

The growing significance of ICTs as supportive initiatives in rural development renders the need for evaluation of such programmes which can have beneficial effects, as well as negatives effect on communities. The evaluation of ICT initiatives is essential as it will generally determine the need, effectiveness, impact, sustainability and extent of the awareness of the contribution of such projects in poverty alleviation and development. Nevertheless, current ICT4D evaluations are confronted with shortcomings and challenges which influence the feasibility and reliability of evaluation conclusions. The SLL baseline study presents an example of the practices applied and experience in an attempt to conduct an effective evaluation. This evaluation approach which formed part of the initial stages of the newly adopted Living Lab concept endeavours to advise external stakeholders of the current status of the community but also raise a general awareness in the Mpume community of ongoing challenges and involve villagers in identifying possible solutions to alleviate local poverty. Evidently, it keeps in mind the need for the evaluation, as well as attempts to overcome most of the common shortcomings associated with ICT4D evaluation. The baseline study provides a foundation for subsequent evaluation domains that should be conducted throughout the life of the project, particularly, process assessment, a needs assessment, and impact/outcome assessment. Evaluation should be a continuous iterative process to elaborate on and develop key aspects highlighted in the baseline study, such as local information needs. Understanding the concept of *programme evaluation* can provide a guideline for developing a comprehensive evaluation framework that addresses and considers the shortcomings and challenges of current ICT4D evaluation.

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