

# Sustaining ICT for Development Projects: The Case of Grameenphone CIC

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Information and communications technology is increasingly being used to enable social and economic development of underdeveloped economies. In this paper we draw on the literature on ICT for development to propose four conditions necessary for the sustainability of such initiatives: appropriate positioning of the project for finance flow, appropriate content, the need for a local catalyst, and an appropriate view of ICT within the project. We then present an evaluation of the Grameenphone CIC initiative against these four conditions. We argue that while it may not always be possible to discover linear cause-effect relationships vis-à-vis sustainability, ICT for development initiatives such as Grameenphone CIC can build in mutually reinforcing elements of sustainability based on the four conditions proposed here.

## 1 Introduction

ICT initiatives in underdeveloped countries (ICT4D) financed in some form or other by western countries need to be evaluated and assessed to determine whether they are successful or not. This is especially true of community telecenters such as Grameenphone Community Information Center (GPCIC) in Bangladesh, which are specifically aimed at bringing the benefits of new technologies to the rural poor.

However, before we come to the thorny question of defining *success* in this context, a more basic issue needs to be addressed first. For any ICT initiative to have a chance of success, it has to first survive. In other words, it has to be sustainable. While there are several dimensions of sustainability in this context as elaborated later in this paper (Ali and Bailur, 2007), the vital one is financial or economic sustainability. In simple terms, it must be a going concern where income must be at least equal to expenditure.

The challenge therefore is this: how can initiatives such as GPCIC become sustainable? In this paper, we will draw upon the growing body of literature in the

area of ICT4D, especially on sustainability to propose four conditions for sustainability. We will use examples from around the world to illustrate our points. Then we will examine GPCIC against these four conditions and list some specific issues that GPCIC need to address in order to achieve sustainability. We will comment on some specific aspects that link these issues to success, based on theoretical and conceptual work done by researchers and practitioners in ICT4D including ourselves. Hopefully, the ideas expressed in this paper will help GPCIC and Telenor to plan similar projects. We will also reflect on implications these ideas can have on research in ICT4D.

## 2 Sustainability

### 2.1 Dimensions of Sustainability

As indicated in the Introduction section, there are various dimensions of sustainability. Table 1 summarizes these dimensions.

While all these dimensions of sustainability are important in their own right, and provide us with a

Type of sustainability	Description
Economic or financial	The long-term ability of ICT projects to generate adequate income to meet their operational and maintenance costs
Social	ICT4D projects to address social concerns, involve local actors, impact social structures (for example through empowerment of marginalized groups)
Technological	The long term availability and durability of the technology without recourse to major changes in hardware or software
Institutional	Linked to social sustainability but mainly focuses on political stakeholders that might affect the project and its viability
Environmental	The use of environmentally friendly equipment and the use of recycling and safe disposal of PCs etc.

Table 1 Dimensions of sustainability (based on Ali & Bailur, 2007)

deeper understanding of the term, they all contribute, in some form or other, either to financial sustainability or are dependent on it. For example, social sustainability focuses on whether the project can survive in a specific social context. This is important because any project that is not socially acceptable will not survive in the long run. However, a socially accepted project still has to be run and expenses have to be met. The question then is how an initiative such as GPCIC (or telecenters in general) generate revenues? Below we explore factors that influence sustainability.

## 2.2 Factors Influencing Sustainability

There are essentially two ways of generating revenues for CICs: either users have to be charged for usage or it has to be funded by some agency. Thus positioning for steady funding is a crucial factor. We then come to the crux of the matter: irrespective of the type of approach or category of source that will ensure sustainability, the fundamental question is why should users (customers) or sponsors pay? In other words, what is in it for the CIC's customers or sponsors? The answer to this is essentially quite simple: the service provided by the CIC should be useful to them. Thus the type of content and service provided by the CIC are vital. However, providing the right content and the right service requires that those who provide these services and develop the content are the appropriate people. We call such persons "champions or catalysts". Further, these catalysts must view ICT in a manner that will enable them to develop the right services. Below we further elaborate these issues.

### Positioning for Revenue Flow

The revenue flow necessary to sustain CICs can come from the public or the private sector or an external agency such as an NGO or foreign aid agency. Aid agencies or NGOs cannot be expected to fund such initiatives over a long period. The solution then lies in the first two alternatives, namely public or private funding. There can also be a combination of these, the most prominent being public-private partnership (so-called PPP).

The public sector can fund CICs in a number of ways. They can be seen as investments in infrastructure building and thus platforms to achieve some governmental objectives such as providing employment or motivating the youth to become social entrepreneurs (Choudhury, 2007). Alternatively, CICs can be part of a bigger project so funds will continue to be allocated. There are examples of such initiatives from around the world; for example such centres could be part of a library (seen in many countries including Norway, USA, South Africa), they could be undertaken within publicly funded municipal projects (Sao

Paolo in Brazil) or as part of e-Government initiatives (e.g. Tanzanian Ministry of Industry).

A good example of a public-private partnership is the e-Seva initiative in the south Indian state of Andhra Pradesh. It offers a range of government-to-citizen services (G2C) at a single location, such as payment of utility bills and taxes and issuance of permits and licenses (Prashanth, 2004), as well as business-to-customer services such as payment of credit card bills. E-Seva began as a government-funded pilot project in two urban locations, and was then extended to cover much of the state through privately run centers.

The most obvious example of a privately funded information centres would be the numerous cybercafés or Internet cafés seen in Bangladesh or elsewhere. We will not discuss such cybercafés in this paper as these are often set up by private individuals and therefore not relevant to our discussion on GPCIC, which we classify as being part of a private organization's strategic initiative. An example will illustrate this category. E-Choupal is a CIC project initiated by the Indian Tobacco Company explicitly to tighten its link to the tobacco growers who are their main suppliers (Kumar, 2004). While checking prices and being generally informed about the tobacco market are the main drivers for e-Choupals (Choupal means market in Hindi), they also serve as a general purpose CIC.

In a similar vein, GPCIC is a strategic initiative of Grameenphone and tied to its fiber optic network expansion strategy. The fact that it can at the same time bridge the digital divide and has thus the potential to achieve development objectives highlights the interplay of different stakeholder objectives that can achieve a mutually desirable end, no matter what these objectives are.

### Content and Service Provided

It is almost axiomatic that unless the service provided by a CIC is useful, no one will use it. The literature abounds in examples of such useful services – crop prices, weather, government forms etc. There have been attempts to determine best practices in terms of contents and to replicate successful content from one site of CICs to another. The results have been mixed. The reason is rather obvious; the focus on 'Best Practice' content misses a vital point – that useful content is context specific and therefore highly localized. What is relevant in one context is not necessarily relevant in another. Take for example, prices of 'shutki' (a certain type of dried preserved fish) in Chittagong in Grameen's CIC. This information is extremely important in the context of Chittagong, where 'shutki' is produced and traded. It does not necessar-

ily mean that it would be considered equally important in say, Munshiganj where the original Village Computing kiosk of Grameen Communications (a sister organization of Grameen Bank but unrelated to Grameenphone) was set up. The success of the Munshiganj venture was attributed to a great extent on the importance of pineapple farming in that area. Apart from the fact that “shutki” is hardly a favourite food item for the people from Munshiganj, “shutki” and pineapple differ in other aspects as well. Pineapple is seasonal and the need for information is important during the monsoon when it is harvested, but irrelevant at any other time of the year. Commodities such as “shutki” are not affected by seasonal fluctuation.

Thus, an external consultant may not be the right person to determine content. This has to be undertaken locally. In other words, the driver and the catalyst for the content has to be a local champion or activist or catalyst.

### **Catalysts – the Appropriate Developers of Content and Services**

The concept of an activist or catalyst was explored by Sein (2005) who proposed four different paradigms of ICT in development: functionalism, social relativism, radical structuralism and neo-humanism depending on how the actors involved view the ICT application and development. We briefly describe these paradigms below.

In *Functionalism*, arguably the most common paradigm, the main actors are foreign experts from donor agencies with the host government taking a relatively passive role. Here, a real understanding of the local context is often missing as ICT is seen as neutral and development is taken to imply modernisation with no reference to the local context. In *Social relativism*, while the main actors are still external experts, they are seen to play the role of facilitators, and the host country is represented by a local agent such as an NGO who is viewed as a partner. Here a more enlightened approach is often taken to ICT as it is now viewed within its context but development is still seen as some form of modernisation. Both *Radical structuralism* and *Neo-humanism* assume alternative paths to development that are context-relevant but while the main actors of the former view see ICT as neutral and act as partisans for the “exploited” class, the actors of the latter view are often activists whose aim is emancipation of the local population.

The key objective of the paradigms approach is to force the ICT4D actors to question their view of development and ICT so as to contextualise the intervention. Clearly, this is relevant to development of content and services in a CIC. As we explained

above, these contents and services have to be contextual. The paradigm needs to be at least social relativism but most ideally, neo-humanism. The vital requirement though is that the content developer should be local.

### **Appropriate View of ICT – Ensemble and Enabler**

In the context of ICT4D, we have found that ICT is all too often viewed as a tool. Sein and Harindranath (2004) present four views of ICT based on the work of Orlikowski and Iacono (2001): tool view, computational view, ensemble view, and enabler view. Here we present a brief summary.

According to the tool view, ICT is conceptualised as merely a technical artefact that is used to achieve something. The computational view conceptualises ICT as the technology and the algorithms and codes that make up the system. The tool and computational views, while essential for understanding the ICT artefact, do not have much developmental impact. On the other hand, the enabler and ensemble views do have developmental implications as under the former, ICT is conceptualised as a knowledge enabler, while the latter ensemble view conceptualises ICT as part of a bigger ‘package’ going beyond the technology “to activities and interactions performed in specific social and cultural contexts” (Sein and Harindranath, 2004, p.19). Here, ICT is part of an ensemble with social and contextual factors helping to determine how it is conceived within a given project. Simply providing access to information does not ensure that the user will be able to benefit from it. To illustrate, just because a farmer can check the price of their products in distant markets does not help them if they have no way of selling their products in those markets.

The significance of context means that ICT4D interventions must conceptualise ICT as an ensemble when implemented. Eventually, in its use and impact, ICT becomes an enabler. Since CICs are a general purpose manifestation of ICT, they need to be viewed as an enabler, i.e., an ICT intervention designed to enable the flow of information and knowledge to the rural poor. Indeed, information and knowledge flows have been shown to play a critical role in poverty reduction (see for instance, Marker et al., 2002).

### **2.3 Summarizing Sustainability**

The arguments we presented above can be encapsulated in four theses about sustainability of CICs:

First, CICs must have a steady flow of financing – either through revenues generated by charging users or through the public sector in the form of entitlements from governments, or through a private sector’s strategic initiative or partnership between public

and private sectors. Therefore, positioning for steady financing flow is vital. We call it *the appropriate positioning for finance flow condition*.

Second, such steady funding will only come if the content and service provided by the CICs are useful and fill the needs of the potential users. We call it *the appropriate content condition*.

Third, such content and service are highly localized and contextual which requires that only local catalysts and activists can determine the right content. We call it *the local catalyst condition*.

Fourth, these perspectives will not be taken by the stakeholders until ICT is viewed as an ensemble when planning and implementing it and then as an enabler when in use. We call it *the appropriate view condition*.

Only when all four conditions are met will a CIC be sustainable and survive.

### 3 Examining Grameenphone CIC

In order to evaluate the GPCIC projects, one should take into consideration their vision, motivation and objectives. As expressed by Sultanur Reza, Project Manager, Grameen CIC, "Grameen CIC's vision is to bring Internet and information based services to the unserved rural community." (Mahmud 2008)

In the rest of this section, we examine GPCIC against the four conditions of sustainability we proposed above.

#### 3.1 Evaluating against the four Conditions

##### Evaluating against the Appropriate Positioning for Finance Flow Condition

GPCIC is initially funded by Grameenphone, a private consortium of which Norway's Telenor is the majority owner (the other owner being Bangladesh's Grameen Telecom). Grameenphone is a successful business enterprise. The company is the largest mobile phone operator in Bangladesh with over 10 million subscribers and its revenues for 2006 are estimated to surpass USD 600 million. The company's total revenues increased by 57 per cent in the third quarter compared with the same period last year (Telenor 2007).

Thus GPCIC is positioned in the 'private sector led initiative' category and it started with a sound financial backing. Whether this backing would continue, or needs to be continued, depend on several factors. Important among these factors are the objectives

(both financial and social, as well as short-term versus long-term) of the parent company, support from the government for national development by improving and developing infrastructure, and the long-term financial ability of the GPCIC project itself to generate adequate income in order to meet its operational and maintenance costs.

The CICs are designed to be commercially viable and sustainable, so that local entrepreneurs could buy a 'Business in a Box' with a low-cost loan from Grameen Bank. A CIC is equipped with a computer, a printer, a scanner, a web and an EDGE modem (GP has established a nationwide EDGE – enhanced data rates for global evolution – network coverage, an advanced mobile technology that enables high-speed mobile internet and data services). The initial investment in a typical CIC ranges between BDT 70,000 to BDT 100,000 (USD 1,000 to USD 1,425). Grameen Telecom Corporation and the Society for Economic and Basic Advancement (SEBA), the two partners of the CIC initiative, are involved in the selection and training of entrepreneurs, and the distribution of kit and marketing materials. Users pay a small fee to use the CIC's services. The entrepreneurs are expected to become self-sufficient and sustainable through this business model.

Essentially, Grameen CIC's are franchise telecentres that offer marketable services and are expected to meet break even point in 12 months. Whether or not the expected one-year gestation period is working well for most of the CICs, we do not know yet. More time and data are needed to see if the CICs are reaching their break-even point successfully within the expected timeframe (Liyanage 2007).

We came across an example of one Mr. Rezaul Karim that perhaps can be considered as typical. Mr. Karim began his GPCIC franchise on March 23, 2007 in Salimpur, Chittagong. Grameen kickstarted his business with free Internet connection for a period of six months and a two-day training program. His revenue, after about two months in existence, was about BDT 2,000 per month but his monthly expenditure was BDT 4,000 (made up of BDT 1000 for the Grameen subscription and rent, and the cost of utilities at BDT 3,000). Mr. Karim was confident that his earnings would rapidly increase to around BDT 10,000 in the near future. He also hoped that Grameen would provide him with all the promised services (telemedicine or healthline education linkage, video chatting with experts and government service facilitation). He was also hopeful that Grameen would extend their free Internet access to a further six month period (Shaddy 2007).

In sum, GPCIC began with appropriate objectives with the backing of a sound business model. The model is based, in part, on recruiting, encouraging and nurturing local partners (entrepreneurs). We conclude that it is well positioned to generate a steady income flow.

### **Evaluating against the Appropriate Content Condition**

Currently, the content and service provided by CICs are what can be best described as “contextualized best practice”. The GPCIC brochure lists several services that are general in nature (for example, Internet surfing and e-mailing, chatting, video conferencing, computer composing, scanning and printing etc). Also offered are e-Government services (such as access to government forms, access to government web sites), job searches and market information. Actual content development for the local context is not stressed beyond tailoring of some of these services. An example of “contextualized content” could be early warning of cyclones and inclement weather in coastal regions.

Expanding services in areas that are important from social and humanitarian perspectives is important in helping attain social sustainability. Exploring new services that reflect the distinct needs of the people is the key to success. Grameenphone seems to be aware of this as adding health and medical information services in the CICs is encouraged. Recently Grameenphone launched HealthLine, a 24-hour call centre manned by registered physicians who provide basic health information. This can greatly enhance the services provided by the CICs.

GPCIC has also initiated a move to enter into partnership with important government and non-government organisations so that important content can be made available in local language. Providing good, consistent and reliable service is somewhat dependent on basic infrastructure such as electricity. Alternative arrangements may be necessary for handling occasional power outage, which is not uncommon in Bangladesh. One promising avenue could be partnership with Grameen Shakti, a sister organization of Grameen Bank that provides solar powered electricity to its clients in villages.

In summary, we find that the GPCIC still has some way to go in fulfilling the appropriate content condition.

### **Evaluating against the Local Catalyst Condition**

CICs are run by local entrepreneurs (activists), who are supported at the outset with training, loans and technology. GPCIC encourages entrepreneurship. It

has developed sound criteria for selecting CIC project owners from among local entrepreneurs. This helps in achieving social sustainability. Whether this also impacts institutional sustainability, depends on the political “clout” of these entrepreneurs.

Currently, the main criteria in selecting these entrepreneurs seem to be financial solvency and educational background. These are vital characteristics to look for in CIC operators. However, it will be fruitful to also include ‘activist’ individuals who are influential, energetic and motivated, in addition to having a good financial and educational background. They should have the ability to influence people, and to earn their respect and trust. In addition, an activist entrepreneur should have the knack for engaging people in social issues, such as education, healthcare, empowerment of women and other marginalized groups in the society. Our conclusion is that GPCIC has done well in engaging local entrepreneurs but could expand the criteria to seek activists.

### **Evaluating against the Appropriate View Condition**

GPCIC selects the entrepreneurs for CICs, trains them and provides them support. This indicates that they view CICs as more than mere tools, and recognize the need to see CICs as part of a “package”. This is in keeping with the ensemble view.

GPCIC also appears to take an enabler view of CICs. As an example it focuses its CSR (Caring Society for Rural Distressed) involvement in three main areas – Health, Education and Empowerment. As a responsible corporate citizen Grameenphone believes that for sustainable development, it is important to ensure primary healthcare for the economically disadvantaged people, both in terms of service and access. (CSR is a Non-Government Organization that conducts free Friday clinics providing primary healthcare to the economically disadvantaged community. The CIC established by Grameenphone will make CSR self-sufficient by serving as an alternative source of income.)

Despite the fact that GPCIC has adopted the right perspective, and there are examples to support this, it is still too early to claim success of the GPCIC projects as enablers and as ensembles.

## **3.2 Success of GPCIC**

GPCIC has been in existence only since February 2006. It is too early to evaluate whether it has been successful or not in a setting as enormous and complex as Bangladesh. We can simply point out that its growth to 560 centers in two years is impressive. It indicates that GPCIC services are being rapidly

adopted. However, as pointed out by *The Economist* (2008), adoption does not necessarily predict diffusion and actual use. Whether the number of centers can reach a level where they can meet the needs of a reasonable fraction of a country of 140 million people remains to be seen. In any case, the growth is simply a measure of what Sein and Harindranath (2004) call the “first order” or “primary” and possibly “second order” or “secondary” effect. It is necessary to eventually reach tertiary effect to achieve a developmental impact. Below, we discuss these three types of effects and indicate the key issues that GPCIC needs to address to ensure a successful impact.

### The three Levels of Impact

Sein and Harindranath’s (2004) model posits that ICT impacts society through three effects. The *first order or primary effect* is simple substitution of old technology by the new. Primary effect is observed when people use the ICT to do things that they would otherwise do without computers. For example, they would use the word processing capability in a GPCIC to write letters instead of by hand. Another example could be checking market prices of commodities through the Internet in a GPCIC instead of say, asking travellers, or reading newspapers or using a telephone. So far, there are indications that GPCIC has had primary effect although no statistics exist. We rely only on anecdotal evidence. We argue that while the primary effect does not necessarily indicate development, it is essential for higher order effects to take place.

The *second order or secondary effect* is an increase in the phenomenon enabled by the new ICT. In case of GPCIC, a secondary effect is observed when people seek more information about markets, or write more letters. Another indication of secondary effect is more people seeking useful information than before. There is no statistical evidence about secondary effect of GPCIC either. However, a surrogate measure could be the growth in the number of centers, the logic being that more centers would lead to more users and thus more use. There is however no evidence for this yet.

The *third order or tertiary effect* refers to societal and economic changes resulting from the introduction of new ICT and their use. It is here that GPCIC has the potential to have the greatest impact on development. For instance, they could become centres of new entrepreneurial initiatives such as ICT training, as happened in the Akshaya programme in Kerala, India (see Pal et al., 2005) or provide opportunities to empower women and unemployed youth as in the case of the Amader Gram Learning Centres (AGLCs) in Bangladesh (Raihan and Roy, 2007). The secondary impact of GPCICs in terms of increased com-

munication and knowledge flows may also result in further tertiary impacts such as a more open society or changes in societal norms. There is some anecdotal evidence of it happening. In a conversation with one of the authors, Sultanur Reza recounted the story of an incident where a village market was being cleaned through tearing down of several buildings. When the building housing GPCIC came under threat of demolition, it was the power elite in the village that opposed it and eventually the building was saved. This indicates that the elite have come to realize the enabling potential of ICT.

There is also precedence in Bangladesh that tertiary effect can be achieved. Real structural change resulted from the Grameen village phone program, through the empowerment of women (Welle-Strand, and Molden, 2007). One way to achieve this is for GPCIC to target women – just as Akshaya did in Kerala and the Grameenphone did in Bangladesh.

### 3.3 Summarizing Assessment of GPCIC

Grameen CIC’s objectives are (Reza, 2006)

- To develop a Business Model which is suitable and sustainable;
- To identify various content relevant to villagers’ lives which will help ensure financial stability of the centres;
- To find suitable partners to spread it at grass root levels.

The number of Internet users at the CICs is going up and the number of CICs is also on the rise. According to Sultanur Reza, “We hope that 80 per cent of the present 560 CICs will become sustainable (economically viable) by June and 90 per cent by the end of this year (2008)” (Esther 2008). It is a good sign that Grameen CIC’s proponents are aware of the importance of developing a sustainable business model. Considering all four conditions, GPCIC has the potential to become a sustainable project. Its performance and promise, however, are varied when evaluated with respect to individual conditions as we have described above.

There are additional issues that we would like to mention. One question is identifying the intended audience of GPCICs. At present it is mainly the educated middle class – the slick advertising films show a country cousin telling his visiting relative from the city that “we may not have this and that, but we have Internet”. This is also reflected in some of the content. For example, one of the health tips on GPCIC sites CIC tells people to have parsley everyday, which is good for health. To the overwhelming

majority of the people in Bangladesh, parsley is an unknown word. This is an example of context-neutral application of ICT, i.e. the absence of an ensemble view.

It is however important to keep in mind that the audience discussed above is mainly the direct users of the GPCIC. There is a vast audience who do not use the CICs directly but nevertheless gain from it. The prime example is the farmer from Bhanga, a remote town who was facing problems when virus infected his chilli plants. A CIC operator who became aware of his problem collected information from a web site and advised the farmer accordingly leading to a resolution of the problem. Giving the fishermen the latest weather forecast from the Internet over a loudspeaker in Andhra Pradesh in India is another example. Such “chauffer driven” use of the computer is nothing new. In fact the first such users were top level managers in business organizations who neither had the ability nor the motivation to learn to use the computer.

This of course leads to the possibility of manipulation of information. Is the farmer getting all the information he needs or is any information deleted that would be useful but that runs counter to the interests of the operators or controllers of the CIC? This is especially a concern with centers that are part of a private organization’s strategic plan. For example, e-Choupal’s centers are located in the houses of prominent villagers who are not immune to vested interests – either their own or a powerful group’s. It is even more critical to view ICT in its context, as an ensemble, in such cases.

## 4 Discussion

In this paper, we have argued that the vital issue of sustainability needs to be addressed satisfactorily before impacts of ICT4D initiatives can be examined. We proposed four conditions that must be met to attain sustainability. The discerning reader can readily point out an omission in our conditions – that is reliable technology and uninterrupted service. We deliberately did not go into this aspect because we feel that it is a given – without reliable technology and service, no ICT initiative can survive. Besides, it is captured in the ensemble view of ICT. There is another aspect of service provision that needs to be pointed out. Regrettably, the concept of good service is not widely shared in a typical Bangladeshi business environment. The principle that consumers/subscribers have a right to good service is often ignored, or not appreciated by most businesses in the service sector of Bangladesh. In most cases it is an issue of cultural mind-set and can be improved by setting examples.

We stress that we mainly relied on secondary sources and anecdotal evidence, augmented by some conversations with some key informants, such as Sultanur Reza, in our analysis in this paper. Our conclusions should be interpreted in that light. We recognize that a more accurate evaluation requires data based on rigorous field research. An “on the ground” field study is highly recommended either to confirm our evaluations or refute them.

In ICT4D projects such as GPCIC, there is no linear relationship between clearly causal and clearly effectual factors. Rather, they are intricately tied in a mutually influencing relationship where factors continuously and cyclically affect and are in turn caused by other factors. This is especially true about the mutually dependent relationship between sustainability and success – the more a project is sustainable, the more its chance to become successful, which in turn makes it more sustainable. The key is to make this a “virtuous cycle” where each element mutually reinforces the other in the “right” direction. The danger is of course that it can also become a “vicious cycle” – unsuccessful projects do not sustain, and projects that do not sustain have little chance to achieve success.

While we argue that only sustainable projects can lead to development, there is evidence that resolving the inherent tension between the stated (macro) objective of development and the essential requirement for financial sustainability at the micro level – through, for instance, entrepreneurial activities – can be a major challenge (see for instance, Kuriyan et al., 2006). Addressing such inherent tensions would require us to understand the social, economic, and political context of ICT at the local and national levels; i.e. viewing ICT as an ensemble.

World Bank figures (The Economist, 2008) indicate that underdeveloped countries are quick to adopt new ICT, but they do not diffuse or use them in any meaningful manner. This implies that while we have been good at introducing new technology in these countries, we have failed in spreading their use. Clearly, this is a key problem with sustaining the use of such technologies. Our arguments in this paper shed some light into the reasons for such lack of diffusion or use.

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