Frameworks for ICT Policy:
Government, Social and Legal Issues

Esharenana E. Adomi
Delta State University, Nigeria
Chapter 4

Analysing an ICT4D Project in India Using the Capability Approach and a Virtuous Spiral Framework

Helena Grunfeld
Victoria University, Australia

Sriram Guddireddigari
Monash University, Australia

Benita Marian
The East West Foundation of India, India

John Peter
The East West Foundation of India, India

Vijay Kumar
The East West Foundation of India, India

ABSTRACT

The field research covered in this chapter represents the first wave of a longitudinal study, aimed at testing a framework for evaluating the contribution to capabilities, empowerment and sustainability of information and communication technology for development (ICT4D) projects. Key features of the framework are: it is conceptually informed by Amartya Sen’s capability approach (CA), uses a participatory methodology and longitudinal timeframe, and considers the micro-, meso-, and macro- levels in understanding the role of ICT in development. Despite the longitudinal nature of the framework, each stage of the research is designed to be a case study in its own right. The research, conducted at a computer centre in the Indian state of Tamil Nadu, centred on the perception of participants with respect to whether the centre had played a role in any improvements in the community and whether they could see a role for it in changes they would like to see, or aspirations they may have for their communities.

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A key finding of the field research was that participants valued the centre mainly for its contribution to education of their children. Education was appreciated beyond its instrumental utility and included intrinsic value, i.e. value that exceeds its potential as a path to higher incomes. Participants frequently referred to how a higher level of literacy would empower them to deal with government officials without intermediaries. This finding is consistent with the CA’s emphasis on development as a process facilitating capabilities that enable people to lead lives they have reason to value.

INTRODUCTION

When allocating scarce development resources, governments like to see hard evidence of the benefits. In the absence of such evidence, there is a risk that decision-makers misallocate resources, either through ineffective ICT deployments or no deployments. An appreciation of the environment in which ICT infrastructure is considered or deployed will “make us wary of blindly following the technological imperative and alert to situations where there is a trade-off between efficiency and human well-being” (Sawhney, 1996, p. 311). It will also contribute to awareness of many benefits of ICT that are not necessarily quantifiable in economic terms, e.g. in the exchange of ideas and for governance processes.

As recognised by many researchers in this field, research aimed at understanding environments in which ICTs have been deployed and their impacts has not kept pace with the significant investments in ICT4D initiatives (e.g. Alampay, 2006a; Batchelor & Norrish, 2004; Gagliardone, 2005; Harris & Rajora, 2006; Hudson, 2006; Nielsen & Heffernan, 2006; O’Neil, 2002; Sciadas, (Ed.) 2005; Souter, Scott, Garforth, Jain, Mascarenhas, & McKemey, 2005; Torero & von Braun, 2006; van Dijk & Hacker, 2003).

ICT4D project evaluations exhibit diversity in frameworks, methodologies, methods and focus. They can be analytical, descriptive and/or prescriptive. Case studies represent a common approach (e.g. Batchelor & Sugden, 2003; Evans & Ninole, 2004; Falch & Anyimadub, 2003; Harris, 2001; Meera, Jhamtani, & Rao 2004; Overà, 2006; Talyarkhan, Grimshaw, & Lowe, 2005) and, apart from a few macro-level studies, they provide much of the evidence of the benefits of telecommunications in rural development (Hudson, 2006).

Whereas case studies indicate the importance of telecommunications in different sectors, such as agriculture, education and health, and functions such as marketing, they do not in general include any systematic analysis and are not undertaken within a specific theoretical framework. Some of the case studies include assertions based on varying levels of analysis, concluding with recommendations for authorities and other implementers of future projects. In commenting on the inadequate theoretical depth in ICT4D research, Heeks (2006), noted that while there has been reasonable theoretical underpinnings related to the first three letters of the ICT4D acronym: ‘I’ (library and information sciences), ‘C (communication studies), and ‘T’ (information systems), this is not the case for ‘D’ (development studies), which in his view have been meagre.
The case study presented in this chapter represents the initial field research in a longitudinal study aimed at providing an input into the debate on suitable frameworks for understanding how ICT can contribute to capabilities, empowerment and sustainability from a development perspective. Despite the longitudinal nature of the framework, each stage of the research is designed to be a case study in its own right and be useful on a stand-alone basis, as it enables others to learn as the study progresses, even without an opportunity of reading results from subsequent research phases.

The conceptual framework is outlined in the next section, which includes an introduction to the capability approach (CA), as this has informed the conceptual framework. The case study includes sections on the micro-, meso-, and macro environments, methodology and key findings of the field research data, which was analysed through the lens of the conceptual framework.

**BACKGROUND AND CONCEPTUAL FRAMEWORK**

This chapter presents and tests a conceptual framework, designed to understand how and under what circumstances an ICT4D project can contribute to capabilities, empowerment and sustainability, taking into account factors that facilitate and inhibit their achievement.

The conceptual framework, the capabilities, empowerment, and sustainability virtuous spiral framework (CESVSF) is informed by the CA and applies a forward-looking longitudinal perspective to the micro-, meso- and macro-levels, using participatory methodologies. It recognises that many impacts are not direct, but are similar in nature to the concept of spillovers in economics, i.e. their influences may extend in unpredictable ways, even to those not directly involved in an activity.

"Static, one-shot, cross-sectional studies” identified by Orlikowski & Baroudi (2002, p.54) as the main form of IS research, are also predominant in ICT4D, where most evaluations are undertaken upon the completion of a project. Although it may take some time before new technologies are accepted at a community level and even longer for them to have an impact, longitudinal studies are sparse (Gaved & Anderson, 2006). The study by Ramirez (2001) on community-based networks in Canada is one of the exceptions.

The micro-, meso- and macro-levels refer primarily, but not exclusively, to the geographic dimension. The micro-level is the smallest unit under consideration. In this case, it comprises the Vicki Standish e-Education Centre (VSeEC), the focus of this study, villages in its catchment area, and possibly the next institutional layers above, the panchayat. The central government, with its policies and practices are at the macro-level. The boundaries between these two and the meso-level are more difficult to define, as there are several nested hierarchies within this somewhat simplified three-tier scale. In addition to the central government, the state government can be considered to operate at the macro-level, although it has some meso-level characteristics, as do mediating organisations, such as NGOs.

The boundary of the meso-level extends to the micro-level, in the geographic domain. It is not the exact definition of these layers that is of relevance in this context, but rather an understanding of the dependencies and information flows between them and the impact they have, can, or should have on each other. Analysis of these interdependencies is akin to systems theory, an approach advocated by Ramirez (2003) and Andrew & Petkov (2003) to enhance understanding of ICT and its contexts, particularly in rural environments.

In a conceptual dimension, the three tiers can be thought of in terms of the extent to which it is possible to generalise. From this and the geographic perspective, the meso-level is useful when considering scalability and replicability, as it is “less sweeping than macro concepts, without claiming that everything is different” (Bebbington, 2004, p. 348), i.e. it is expected that
some degree of generalisation will be possible. Focussing on either the macro-level with studies on the relationship between ICT, the policy and regulatory environments and/or economic growth, or on implementation of specific projects at the micro-level, most ICT4D research overlooks the meso-level, despite the likelihood that it is at this level service provision can be most responsive. In addition to government authorities, this level is inhabited by infomediaries and a range of organisations that can facilitate effective use of ICT (Duncombe, 2006; Ramirez, 2001).

In terms of ICT deployments, there are several illustrations from India of three-tier ICT4D initiatives. The three-tier n-Logue (Jhunjhunwala, Ramachandran, & Bandyopadhyay, 2004) structure and the model used by the Informatics unit of the M.S. Swaminathan Research Foundation (MSSRF) illustrate the diversity in the application of the three levels, with private sector involvement in n-Logue and a community based model in MSSRF. At the time of the study, MSSRF, headquartered in Chennai, had 18 Village Resource Centres (VCRs) spread across several states, supporting 94 Village Knowledge Centres with functions such as technical assistance, information gathering and coordination of training. A three-tier approach is not a guarantee for success, as indicated by Jain & Raghuram (2005) in their study of Community Information Centres in Nagaland, which, despite the involvement by central, state and local authorities, did not accomplish their objectives.

In contrast to classical economic theory, where motivations and perceptions of participants are not relevant, these often play a major role in the CA and in participatory frameworks (Anyaeogbunam, Mefalopulos, & Moetsabi, 1999; Ramirez 2001; Robeyns, 2001), where local participation in assessing how ICT can contribute to capabilities would be important. The CESVSF envisages that participants would identify basic capabilities that are common to different places and cultures, such as literacy and employment as well as capabilities that are specific to each environment. Some capabilities assumed to be essential for development and likely to be required for and facilitated by a sustainable ICT infrastructure are illustrated in Figure 1, which depicts a ‘virtuous spiral’ that is expected to emerge for appropriately implemented ICT4D projects.

The CESVSF assumes that a minimum set of capabilities are required to establish, manage and use a basic ICT infrastructure - shown as ‘obtain initial funding’ in Figure 1. Alternatively, this function can be performed by a mediating organisation such as the VSeEC, in this case study. Using a basic level of IT artfulness, individuals can gain confidence and increase the control over their own lives (Corea, 2007). This in turn can strengthen the IT infrastructure in their communities, whether in the form of better skills, equipment and/or services. With each cycle of this spiral, there are new insights and improvements in capabilities, which strengthen community members and expose them to new realities that can improve their livelihood conditions to enable them to do and to be what they have ‘reason to value’ in a sustainable way.

The Capability Approach

“Instead of asking about people’s satisfactions, or how much in the way of resources they are able to command, we ask, instead, about what they are actually able to do or to be” (Nussbaum, 2000, p. 12). This question is central to the CA and stands in contrast to questions about utility, preference satisfaction, and/or access to resources, indicators that characterise the utilitarian and welfare approaches to development.

The seminal book by the 1998 Nobel Laureate in Economics, Sen (2001), ‘Development as Freedom’ (‘DAF’), first published in 1999, was the culmination of considerable work carried out by Sen at least since the 1980s to develop a framework for development that is grounded in human development as an alternative to the prevailing focus on economic development. Oth-
ers (e.g. Alkire, 2005; Comin, 2001; Corbridge, 2002; Gasper, 1997; Robeyns, 2001; Stewart (2005), Stewart & Deneulin, 2002; Nussbaum, 2000, 2006) have contributed to the development of this framework both before and following the publication of DAF. The versatility of the CA is illustrated by the wide range of research to which it has been applied, e.g. definition by children of their capabilities in an endeavour to understand appropriate dimensions of children’s well-being (Biggeri, et al. 2006), analysis of poverty alleviation programmes in New Zealand and Samoa (Schischka, Dalziel & Saunders (2008) and addressing a river water dispute between different Indian states (Anand, 2007).

Rather than focussing on economic growth and income to evaluate outcomes of development initiatives, adherents of the CA have argued in favour of using capabilities of individuals to ‘lead the lives they have reason to value’, as an informational base for evaluations. This approach has had considerable influence on welfare and development economics and is reflected in the UNDP human development index (Sen, 2000).

At the heart of the CA lies the importance of the “expansion of freedom … both as the primary end and as the principal means of development” (Sen, 2001:xii). Development is considered to be an extension of freedoms, which are viewed as the basic building blocks to development, as well as “the expansion of ‘capabilities’ of persons to lead the kinds of lives they value — and have reason to value” (Sen, 2001, p.18). This focus on freedom, which distinguishes the CA from frameworks advocating growth at any price, including doctrines justifying that the end justifies the means, does not mean that economic variables such as income and access to commodities are considered irrelevant. They are, however, inadequate for measuring quality of life and livelihoods. In the CA framework, certain political and social freedoms, such as the freedom to participate in political activities and to receive basic education are considered to be constitutive of development (i.e. they are relevant whether or not they contribute to economic development and/or growth). Certain capabilities are required to achieve and enjoy freedom. There is also a link between capabilities and human equality, as discrimination of any kind is considered a
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“failure of associational capability” (Nussbaum, 2000, p. 86).

As individuals, according to the CA, are responsible for their own well-being, it is up to them to decide which capabilities are important to them and how, subject to external constraints, these should be translated into functionings. These describe what a person is actually doing with his or her capabilities or the state of being resulting from this.

As many who have tried to effect change in a community would be able to attest to, there are many barriers, of an institutional nature, between somebody’s capability of doing something and actual achievements. Considering the CA to be too focused on individualism, Stewart & Deneulin (2002) suggested an extension of the concept to include “valuable structures of living together” (p.68), i.e. structures that can impact positively on people’s well-being. They specifically enumerated “functional families, cooperative and high-trust societies and social contexts” (p. 68) and argued that this inclusion would be important from a policy and research perspective. From the policy angle, more attention would be placed on structures that facilitate or inhibit development.

This critique of the CA did not take sufficient account of the CA’s recognition of external constraints, including institutional constraints, involved in obtaining and using capabilities. Furthermore, the CA recognises reciprocity between individuals and institutions in that a person’s capabilities not only depend on social arrangements and institutions but also influence others, as described by Sen (1985a): “Given the intrinsic importance of well-being, and indeed of agency, it is not credible that a person can morally evaluate his or her actions without taking note of their effects on the well-being and agency aspects of others (including their well-being freedom and agency freedom)” (p.216). This means that the CA accounts for impacts at a wider community level, without defining geographic or other limitations in the definition of a community.

Another way of illustrating the importance attached to institutions in the CA framework is the recognition that, although poverty “entails a lack of basic capabilities to lead full, creative lives” (UNDP 2003, p.27), capabilities represent only one of four dimensions identified by Sen (2001) as essential for poverty alleviation. The others are: opportunity (access to markets and employment), security/vulnerability to economic risk and to all forms of violence, and empowerment, external to as well as within households, all of which depend on institutional frameworks at the macro-, meso-, and micro-levels. The importance of these domains played out in several ways in the research, whether in the form of absence of a broadband infrastructure, potential security issues when accessing VSeEC after dark, and education as a tool for empowerment.

Developed as a critique against the more prevalent utilitarian approach to evaluation and with its emphasis on the importance of capabilities as the basis for evaluations, Comin (2001) described the CA as “a framework for evaluating and assessing social arrangements, standards of living, inequality, poverty, justice, quality of life or well-being” (p. 4). However, a main difficulty of applying this framework is the lack of operationalisation of the concept (Alampay, 2006a; Comin, 2001; Gasper, 2002).

One way of overcoming the lack of operationalisation, thereby making the concept more useful to development policy could be to list basic capabilities. Nussbaum has been a vocal advocate of doing this and has also developed a tentative list, which she admits must be subject to review over time and in different contexts. Despite insisting that capabilities should be formulated through democratic processes, in his practical work, Sen has nevertheless assumed that there would always be democratic support for capabilities of being healthy, well nourished, and educated: “expansion of health care, education, social security, etc., contributes directly to the quality of life and to its flourishing” (Sen, 2001, p. 144). Sen
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has also recognised the role that ICT can play in contributing to these basic capabilities.

**ICT4D and the Capability Approach**

In the CA, access to physical ICT infrastructure would not be a sufficient determinant of how individual preferences, capabilities and choice would influence the use of and benefits derived from it. Inherent in the CA is a reciprocal relationship between ICT and capabilities in that individuals require certain capabilities to be able to benefit from ICT, which in turn facilitates the free flow of information: vital to democratic freedom. As expressed by Sen (2005), “… access to the web and the freedom of general communication has become a very important capability that is of interest and relevance to all Indians” (p.160). ‘Access’ to physical infrastructure alone is not sufficient and the concept of access must be extended to include capabilities, (e.g. [computer] literacy), to actually use the infrastructure.

Several studies have applied the CA to ICT, or at least referred to a relationship between these (Alampay 2006a, 2006b; Barja & Gigler, 2005; Byrne & Sahay, 2007; Garnham, 1999; Gigler, 2004; Madon, 2004; James, 2006; Mansell, 2006; Musa, 2006; Thomas & Parayil, 2008; Walsham & Sahay, 2006; Warschauer, 2003, Zheng & Walsham, 2008).

A common thread in the literature linking the CA and ICT is the attention given to the capabilities of the user to benefit from technology in ways that will achieve the desired functionings. In this context the CA can be useful in actually shaping the design of ICT interventions, taking into account interests and perspectives of individuals. For example, rather than treating ICT4D interventions as just infrastructure, Musa’s (2006) modified version of the technology acceptance model (TAM), refers to the relevance of CA in its focus on the intrinsic value to individuals of such initiatives. Garnham (1999) analysed the contribution made by communication media to enhancing a range of functionings, using the capabilities approach to highlight that both the type of infrastructure and the ability of people to use it should be taken into account when evaluating impacts of ICT on human development. This is similar to the concept of ‘effective use’, which has been of concern in the community informatics approach. Calling for more resources to be allocated to the development of applications and support, rather than just infrastructure, to benefit users in developing countries, Gurstein (2003), defined ‘effective use’ as “the capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals”.

Other researchers with an interest in the CA have gone a few steps further and applied the framework to specific countries or projects. Alampay (2006b) used the CA for explanatory purposes in an investigation of ICT ownership and access in two locations in the Philippines and concluded that in order to contribute to human development; those who are marginalised must first be made aware of opportunities inherent in new ICTs. In their case study on a community health information system, Byrne & Sahay (2007) referred to DAF when advocating in favour of a participatory methodology for establishing the informational base for the project and determining how the information collected should be used, taking into account capabilities of community members to actually use the information. Informed by the CA, Barja & Gigler (2005) suggested a conceptual framework for measuring information poverty in Latin America that recognised the role of ICTs in the advancement of human freedoms. They drew attention to the requirement for new capabilities for the exchange of information about the economy, politics, and society in addition to the need to strengthen the capabilities of the poor with respect to ownership and use of economic assets.

Applying the CA, or ‘functionings’ approach, as he referred to the CA, James (2006) explored the relationship between the Internet and poverty, focussing on what occurs after the ‘point
of purchase’, i.e. the usage, contrasting this to traditional welfare economics, where the focus is on the point of purchase. In doing so, he critiqued the ‘telecentre’ model in favour of initiatives that blend the Internet with radio, using the example of Kothmale in Sri Lanka. Several single initiatives have in fact deployed a mix of technologies and a range of different methods to reach a wider audience. Others are planning to do so.

Comparing research results from one village in Kerala and one in Andhra Pradesh, Thomas & Parayil (2008) found better capabilities to use ICTs and convert information to useful knowledge in Kerala and attributed this to the more equitable socio-economic development in that state. They concluded that access to ICTs does not in itself lead to development, but requires social and political intervention to achieve progress in this area. These findings are similar to those made by Niles & Hanson (2003), in their analysis of the key role played by the social context in the process of conversion from physical Internet infrastructures to useful knowledge. Conditions existing prior to the deployment of ICT infrastructure shape both constraints and capabilities to use this medium.

Despite this reasonable body of work related to ICT and CA, the literature is nevertheless sparse when it comes to applying the CA to participatory evaluation of ICT4D initiatives. Unlike writers who refer to the CA as a way forward for future research in general terms, but without including reference to in-depth field studies based on this approach, Mansell (2006), suggested that “one way of ensuring greater participation of the poor in ICT4D initiatives could be an evaluation of priorities in the light of entitlements as outlined in DAF …” (p.903).

This research accepts the challenge presented by Mansell. Attempting to fill a knowledge gap in the relationship between ICT and the CA at the empirical level, the research aims at developing a framework that can explore the reciprocal influences between ICT and capabilities in a systematic, forward looking longitudinal manner through a participatory approach. In doing so, the significance of having contrasted the CA with the more traditional development economics lies in the method of choosing the informational base for exploring the impact on individuals and communities of an ICT4D initiative in India. Consistent with the CA, the impact will be assessed in areas that are relevant for the population, rather than using pre-defined indicators. Outcome Mapping (Earl, Carden, & Smutylo, 2001) and Most Significant Change (Dart & Davies, 2003) are two approaches that, although not making specific reference to the CA, have adopted participatory methods in identifying factors that are relevant for evaluative purposes in different contexts. These methods have influenced the design of this research and some aspects of them may be useful for operationalising the CA in general. However work on trying to synthesise the CA and these approaches is beyond the scope of this chapter, but could be an important research topic in its own right in an endeavour to contribute to operationalising the CA.

CASE STUDY: VICKY STANDISH E-EDUCATION CENTRE (VSEEC)

In this section we present the first phase of research conducted at the VSeEC in the form of a case study. Although this research forms part of a three-year longitudinal study of VSeEC’s influence on communities in its coverage area, we have designed the research to enable each phase to also be analysed and presented on a standalone basis. The section starts with describing the centre and the environments within which it operates. We then report on the field research, including methodology and key findings.

Micro-Level

The East West Overseas Aid Foundation (TEWOAF), an Australian based NGO and its Indian
partner organisation, The East West Foundation of India (TEWFI) fund and operate the VSeEC, the Uluru Children’s Home (UCH), with which it is associated, a health clinic, and other community development initiatives in the Alamparai-Kadapakkam area in the Indian state of Tamil Nadu. The funding comes from private donations to these organisations. Engineers Without Borders Australia (EWB), was responsible for designing and has been instrumental in operating the centre. No charges had been applied for use of the VSeEC when the research was conducted. Financial sustainability of VSeEC, an issue that has plagued many ICT4D initiatives, is not addressed in this study. VSeEC was established as a non-profit centre, funded through donations to TEWOAF. However, as the centre expands from its current nine computers to full capacity of 36 (through donation of additional funds to cover this cost), the operational expenses, including staff, maintenance and power, could increase to such an extent that it may be necessary to pay greater attention to financial aspects. There was one full time systems administrator, and one part time employee at VSeEC, when the study was conducted, but this may not be sufficient when the centre is fully equipped.

The TEWFI complex is located at the Bay of Bengal backwaters, in a relatively isolated rural coastal community, five km east of the East Coast Road (ECR), between Chennai (125km) and Pondicherry (46km). The catchment area of TEWFI’s activities is defined as having a radius of approximately five km. Seven villages are located within this distance, three of which are defined as fishing villages and the others as farming villages. The main village of Kadapakkam, on the ECR and the market one km inland are included within this radius. Administratively, the area is in the Edaikalinadu Panchayat, Cheyyur Taluk, Kancheepuram district. There are also informal leadership structures within the villages. The 2001 census showed a population of 25,793 in Edaikalinadu, the lowest administrative level for which census data could be found.

Consistent with the inscription on the inauguration plaque at the entrance of the VSeEC building: ‘….with intent to serve the local community’, the aim of the centre is to serve as a resource for the local communities as well as for the children living at UCH. Inaugurated in 2008, the VSeEC had been operational for only eight months when the research reported in this chapter was conducted in September/October 2008.

Although no loss of life was suffered when the fishing villages were affected by the December 2004 tsunami, many homes, fishing boats and other fishing equipment were damaged or lost. The villages were subsequently relocated further from the coastline. As part of tsunami rehabilitation projects there has been an influx of foreign NGOs. The economic characteristics of the area are atypical because of the influence of TEWFI’s presence, which has contributed considerably to employment levels. In addition to TEWFI’s permanent and casual staff, the purchasing power of TEWFI and its overseas volunteers has boosted employment in the private sector. To the extent possible, TEWFI sources food, for approximately 50 people, and other requirements locally. The transport, primarily in the form of auto-rickshaws (three-wheelers), and construction sectors have also been stimulated by the requirements of TEWFI. Other employment opportunities in the area are limited and remittances from family members working elsewhere represent another income source. There is limited scope for higher paid employment in the area, which however has some potential for tourism (Lummen & Ruiter, 2008).

There are several castes in the area, but in order to avoid bringing up an issue that could potentially be divisive, the issue of caste was not addressed during the focus groups. Caste is not relevant to the activities of TEWFI. The government’s affirmative action policies for scheduled castes and tribes have contributed to overcoming some of the disadvantages that previously plagued
their lives. TEWFI has also been open to employing persons of all caste backgrounds and especially those from disadvantaged communities.

A key obstacle confronting VSeEC has been the lack of broadband connectivity throughout the area and Internet was not available when the research was conducted. Access via dial-up was not an option, as the location of the centre was serviced with narrowband wireless local loop lacking data capability. Some of the mobile operators had limited data coverage (GPRS and CDMA) of questionable quality and high prices. This wireless connectivity was primarily used for administrative purposes and had, on occasions provided villagers with information, e.g. for examination results. The local telephone exchange in Kadapakkam, despite being located along a main road and serving a reasonable population size, had not been equipped with DSL at the time of the study. While regional telecommunications infrastructure initiatives and the introduction of competition into the market may have improved network access in some rural regions of India, this area was still under-served and lacking reasonable broadband infrastructure. And this despite the fact that the normal reasons for lack of adequate infrastructure in rural areas, viz mountainous topography and/or thinly distributed population, do not apply for the Alamparai-Kadapakkam area. There were no public Internet facilities in the area. A Drishtee outlet in Kadapakkam (at ECR), where services, including computer courses and access to computers for typing and other functions were available on a commercial basis, did not have Internet access either.

From a CA perspective, the absence of broadband infrastructure is an illustration of a barrier inhibiting both the development of capabilities and the conversion of capabilities into functionings.

**Meso- and Macro-Level**

There are rarely clear boundaries between macro- and meso-environments. For the purpose of this study, India with its central government constitutes the macro-environment. This is where the telecommunications policy is formulated and administered. With almost 70 million citizens, the state of Tamil Nadu can sometimes be too remote from a village to be considered as a meso-level. The boundary between the macro and meso-levels is therefore somewhat blurred in this analysis.

On paper, India has a regulatory framework, including a Universal Service Obligation (USO) Fund which, through a levy of 5% on gross revenue on licensed carriers, is intended to support broadband connectivity and a progressive transformation of village public telephones into ICT community centres (Thomas, 2007). Several reasons have been suggested for the lack of progress in implementation of these policies. According to Rao (2008) various operational, procedural, legal and regulatory issues have impeded progress, whereas Thomas (2007) argued that consideration of access as a basic right is no longer a public policy priority. These reasons describe what has happened, without advancing any explanations as to why the ICT infrastructure momentum has abated. For example, it would be useful to know whether the central government re-evaluated the policies in light of any research findings and whether it consulted with meso- and micro-level authorities and mediating organisations on the usefulness of ICT projects for rural development. If so, what was the reaction? A key objective of undertaking research of the nature covered in this chapter is to provide authorities with a relevant informational base for deciding between competing interests and to provide the public with evidence that is useful for influencing government policies.

In the meantime, for whatever reason(s) and despite the government’s promising framework, villagers have been deprived of a tool they could have used to obtain capabilities for facilitating implementation of changes they want to be able to effect in their communities.
The macro-level also has an important role in the provision of e-government services and to that end the Indian government and many of the state governments have developed many innovative e-government applications. At the central government level, the portal (http://india.gov.in/) provides access to a range of services, including the Right to Information Act, 2005, referred to in some of the focus groups as potentially being of great significance in their dealings with the government.

Despite the resources devoted to these many initiatives, the Indian e-readiness index, according to the 2008 UN e-government study (UN, 2008) declined from 0.4001 in 2005 to 0.3814 in 2008. This resulted in India dropping from 87th place in 2005 to 113th out of 192 countries in 2008. The UN study (UN, 2008) noted the paradox that, whereas India has witnessed significant growth of ICT use in urban centres, this has not been the case in rural locations, despite the initial view that e-government would be a means of overcoming distance. The study hypothesised that the lack of progress was, to a large extent, due to underestimation of the infrastructure challenges.

There also appeared to be an absence of institutions at the meso-level that could influence the government to ensure that such infrastructure be provided. One ‘official’ path for villagers to approach the government is via the panchayat ward councilor, who can raise issues with the panchayat. We understand that this had not occurred, so there is scope for more action by elected representatives at the meso-level.

Despite having embraced the development of the IT sector from an early stage with a comprehensive IT policy and the implementation of several initiatives (Mitra, 2000), Tamil Nadu seems to be losing its foothold at the top of the Indian e-readiness index league table. Although still ranked among the eight e-readiness leaders in the 2006 survey, Tamil Nadu’s position dropped from 2nd to 7th place between 2005 and 2006. Its composite index declined from 0.99 to 0.82. While the e-readiness and e-usage indices both increased, the “environment” index fell from 0.97 to 0.69. This index reflects infrastructure and associated regulatory and market environments (DIT & NCAER, 2006).

The meso-level also includes non-government organisations, many of which can and have played a very important role for the diffusion of ICT, particularly as infomediaries (Ramirez, 2001; Ramirez & Richardson, 2005). The VSeEC already had a working relationship with some mediating organisations; it was using Aid India’s lesson plan material for training and was making extensive use of primary school education material produced by the Azim Premji Foundation. Partnerships also extended to local institutions. One computer had been made available to one of the primary schools in the area. An environmental studies teacher employed by the NGO Pitchandikulam Forest/Bio Resource Centre used another VSeEC computer in his work at the government secondary school in the area. India in general, and the state of Tamil Nadu in particular have a long tradition of involvement by innovative mediating organisations in the provision of ICT services to rural areas. Tamil Nadu is home to several pioneering organisations, well known in the ICT4D community, including the Telecommunications and Computer Networks (TeNeT) Group at the Indian Institute of Technology, Madras (Chennai) and MSSRF. At the time of the study the VSeEC was actively seeking co-operation with these and other organisations.

The situation in the Kadapakkam-Alamparai region fits with the general trend in many developing countries in Asia, where limited connectivity in rural areas has tempered improvements in broadband penetration at the national level. WSIS (2008) attributed this to “inadequate and restrictive policy environments, lack of focus on technological R&D innovations, and limited understanding of the effects of ICTs on communities” (p.7). The research described in this chapter
has been conducted in an endeavour to improve this understanding.

**Research Design**

Before describing the research methodology, we first elaborate on what we mean with the term ‘participatory’, which is used to define one dimension of the evaluation framework. Parfitt (2004) differentiated between participation as a means and participation as an end. The former, unlike the latter, is politically neutral in that it does not deal with any power relationships. It simply invites participants to present their views about what is important to them and may, by doing so in a group situation, be able to draw on the strength of others. This is participatory in contrast to the utilitarian approach, which would typically not involve participants in defining the scope of the research. However this type of participation does not occupy the top rungs of Arnstein’s (1969) ladder of citizen participation, where Arnstein placed partnership, delegated power, and citizen control. Although the methodology used in the field research was not designed to transfer any power, there was also no cynical intent behind the participation, as in the middle rung—“tokenism”—of Arnstein’s ladder (informing, consultation, and placation). Whereas the objective of the research was learning and understanding, the participatory research process could well have contributed to empowerment, although this was not defined as an objective for the research.

Falling within the definition of the interpretivist or naturalistic paradigm, the research methodology adopted for this study was of a qualitative nature, with focus groups, each consisting of participants from specific stakeholder groups: leaders from fishing and farming villages, parents from fishing and farming villages, a women’s self help group including members from fishing and farming communities, a youth group and employees of an NGO. A separate focus group with teachers had been planned, but due to practical difficulties this did not take place. Three teachers participated in the focus group with leaders from farming villages.

As this was an exploratory study without any claims of being representative, there was no attempt to use probabilistic sampling for the invitations to participate in focus groups. Invitations were instead to a large extent based on existing contacts and some snowballing. No information on socio-economic, caste or any other status (except for the village leaders) of the participants was obtained.

The seven focus group sessions were conducted over a period of 20 days in September-October 2008. The intention was to conduct additional focus groups, but for practical reasons that was not possible during this wave of research. The seven focus groups are considered sufficient for a meaningful, albeit limited analysis.

As the lead researcher did not speak Tamil, the local language, the research was somewhat complicated by the need for interpretation, which was undertaken by a social worker employed at TEWFI’s health clinic and the systems administrator at VSeEC. They were also responsible for recruiting participants.

It is reasonable to question the objectivity, representativity, and reliability of the information provided by participants, when considering that the sessions took place in the presence of staff, with what could be perceived as vested interests in the outcomes of the research. Their presence could have influenced participants to express views considered favourable to them and to avoid critical comments. There was also a risk of bias arising from the lead researcher’s reliance on interpretation by staff members and that the views could reflect what the participants expected the researcher wanted to hear. Despite these potential biases, some of the responses were critical of the existing arrangements associated with the VSeEC, e.g. participants in two groups expressed the view that the VSeEC needed publicity to attract more
users and the remoteness of the centre in relation to where people live was raised in three groups. These views indicate that participants were not afraid to voice any criticism. In any case, this was not an evaluation of the performance of staff, so whatever bias there may have been is not considered to have seriously influenced the results. It was also in the interest of staff for VSeEC to provide services that are useful for the intended target groups and that maximum use is made of the centre.

There were also some benefits associated with the role of staff members as interpreters in this study. As they had not previously been exposed to this type of research, the study provided capacity building opportunities for them, particularly in the form of learning the importance of listening to perceptions of community members about services provided by them. Their presence also enabled the focus group sessions to take on the form of exchange of information and impressions as well as research, as they were able to respond to questions from participants. This would not have been possible by an interpreter without knowledge about VSeEC. Such exchanges are consistent with a naturalistic form of inquiry (Guba & Lincoln, 1981).

In some cases, the views expressed by participants were simply noted and in others some probing was applied for the purpose of clarification and verification when bias was suspected. For example, when the fishing village parent group suggested longer opening hours and more computers, we probed why this was necessary, as VSeEC was not always fully occupied.

The research centred on the perception of participants with respect to whether the VSeEC had played a role in any improvements in the community and whether they could see a role for it in changes they would like to see, or aspirations they had for their communities. Using a strength-based approach, the structure of the question framework and conduct of the focus groups were organised around first identifying strengths in the communities. This was followed by asking participants to refer to recent improvements and consider contributing factors to these improvements. This questioning aimed at exploring the role of the VSeEC in any improvements. We then asked participants whether there were any changes and/or enhancements they would like to see in their communities, how they would go about implementing these changes and the role VSeEC could play for this purpose. With those questions we intended to capture the essence of capabilities and functionings they would value and the role VSeEC could play in contributing to their achievements. The framework thus encouraged participants to identify their own solutions to development and to think about ICT as a potential tool. In concluding, participants were invited to provide general comments, views, and suggestions about the VSeEC.

Cognisant of the difficulties and dangers associated with attribution, the focus of the inquiry was on contribution, rather than attribution (Ramirez, 2007) of ICT to communities. Any outcome is likely to be attributable to several factors, some of which are within and others beyond the control of VSeEC’s management, e.g. government policies. The study revealed an insight among villagers that there are multiple sources of attribution to different outcomes, including education.

Consistent with the CA’s views on the informational base for evaluating outcomes and impacts, participants were encouraged to suggest possible indicators that would be useful in measuring the extent to which the suggested changes have been achieved. Participant involvement in defining community based indicators is not limited to the CA. One illustration of where this has been done in the context of ICT is the KNET (2001) project in indigenous communities in Canada.

As the information sought was related to perceptions of the groups, rather than facts, triangulation using other methods for obtaining data was
not undertaken. However, the conduct of several focus groups could be considered as some form of triangulation, as it enabled views to emerge from different contexts. The results were verified by participants at a meeting called to discuss the outcomes of the research.

Key Findings

This section summarises the general direction of responses during the focus group sessions. Where any of the groups did not include the issues included in this section, neither did these...
groups express views that contradicted any of these findings.

Table 1 captures themes that arose in at least two different focus groups. There are some apparent holes in the table, e.g. farmers did not mention farming as a major strength. This does not mean that they would disagree with farming being a major strength, only that they did not raise it. As shown in Table 1, to be educated emerged as far the most important capability, both in terms of defining strengths, identifying recent improvements in the community and as an area where further improvement is required.

The Importance of Education

A striking feature of most focus group discussions was the enthusiasm about the use of computers by children at the centre and the words expressed in one of the sessions that the VSeEC is the “Gift of God” reflected a widespread perception. The children’s ability to use computers had strengthened their, and thereby their parents’ confidence and self-esteem.

It did not matter for the participants, all of whom were over the age of 18, that they did not fully understand what their and other children were doing at the VSeEC. There was trust that the activities were useful and an understanding that the children used programmes with cartoons (Azim Premji software) to learn different subjects.

A prevailing perception was that the new capability acquired by children to master computers was valued as a capability for empowerment, and not only because of any immediate increase in prosperity that would result from this new skill. This does not preclude that the greater confidence can later expand to economic aspects, (e.g. by improving their ability to find employment or start their own businesses). The capability of finding work outside the farming and fishing sectors was mentioned as a high priority. Participants recognised the importance of narrowing the gap between current skill levels and the requirements for employment in the ‘formal’ sector, through investment in education.

Education was a recurring and dominant theme throughout the sessions, whether in the context of identifying strengths or expressing priorities for improvements and the role of the VSeEC in this. There was general agreement that the VSeEC has boosted the prospects for good education outcomes for children. Education also appeared to serve functions other than being a ticket for better employment opportunities. It is also a tool for empowerment, as illustrated by a description in one of the sessions of how community members felt stigmatised and embarrassed when having to rely on others to complete forms and accompany them to visit government authorities due to their low or non-existent literacy skills. This is reminiscent of the concept of being ashamed to appear in public, used by Sen (1985b) to define one aspect of deprivation. Another example of deprivation was the reliance on interpreters when dealing with English speaking NGO representatives in the aftermath of the tsunami. In addition to the material nature of this deprivation in the form of suspicions that they may not have received their full entitlements, there was a sense of powerlessness in not understanding discussions about their lives and livelihoods.

The empowering features of education for normal village life implied in these examples could be one reason for the high importance attached to informal as well as formal education, where the former refers to acquiring specific skills outside the formal education system and the latter to education within the formal system. Participants nevertheless considered certificates to be of significant value, whether or not these are issued by accredited institutions. They represent a sense of achievement. The VSeEC thus has an important role to play in facilitating supported and self-directed learning about topics that are of relevance for community members. High on the list of priorities were computer and English language skills and there was a widespread per-
ception that the use of computers was helping the children with their English skills, (e.g. by getting used to the alphabet and a few English words on keyboards). The importance attached to these skills is consistent with the CESVSF, as these capabilities are fundamental to being able to exploit the full potential of ICT.

**Diversifying Livelihoods**

Despite the inherent value of education, the capabilities of being educated and employable were nevertheless so intertwined in the minds of the participants that it is difficult to refer to these in separate sub-sections of this paper. Participants in several groups, particularly from fishing villages, were adamant that they wanted their children to find employment in other sectors. Education was considered a pre-requisite for reasonable employment conditions, particularly better English language and computer skills. The level of English language skills was quite low in the area.

The wish for a local vocational school and other higher educational institutions were suggested in the context of education for livelihood diversification. Several participants considered this particularly important for young women, many of whom, due to cultural and financial barriers, do not continue their education after completing high school in the local area. They commented that women just sit at home, waiting to get married, but marriage often does not solve their livelihood situation. There were several cases of women having been abandoned by their husbands after giving birth.

The VSeEC, in partnership with accredited vocational education providers, could play an important role in developing capabilities that would enable both genders to diversify their livelihoods.

**The Illusion of and Search for Unity**

One unexpected finding was the frequent reference to ‘unity’ and co-operation, in response to the topic dealing with strengths and assets. Having expected something more directly related to livelihoods, ‘unity’ came as a surprise. It was particularly astonishing against the background of what appeared to be common knowledge of instances of disunity. There were considerable tensions within at least one of the villages, between some of the fishing villages, and between the fishing and farming communities. Participants in the youth group explained that they refer to community members helping each other as unity and illustrated this with how members of their group were funding tertiary education for one of their members who suffers from physical disabilities. Hidden behind the term ‘unity’ could also be a wish to portray the community as being united, a valued capability that could relate to previous dealings with government authorities and NGOs. It is understood that villagers were told that they must speak with one voice in order to obtain certain benefits for their communities.

The ability to unite, form and join groups is another essential capability, which in turn can also be a source of empowerment and a manifestation of the meso-level. There are many inspiring case studies of what can be achieved through groups, rather than by individuals acting alone, in terms of building sustainable livelihoods. However, according to Stewart (2005), disadvantaged persons often lack assets such as networks and human capital required to form groups. In an endeavour to overcome this disadvantage, the Indian government has facilitated the establishment of women’s self-help groups.

The extent to which the capability of forming groups (particularly at the regional level where they could add strength to individual communities) can be facilitated by ICTs could not be tested. Whereas ICT in education can be useful to a limited extent without any communications capability, this is not the case when considering ICT as a tool for establishing groups. Without Internet access, it was not possible to explore whether the VSeEC could be useful in extending...
the geographic coverage of groups, e.g. to facilitate communication between the different villages in the area and between the different panchayats in the taluk, etc. This will be explored in further detail in the next research phase, when it is expected that the VSeEC will be equipped with Internet access. But Internet access in itself is unlikely to be sufficient, particularly with the low level of literacy and inexperience with this medium. In order to maximise the benefits of the Internet, its introduction will be accompanied with involvement by infomediaries (mediating individuals and organisations) that can overcome barriers of low levels of literacy and skills to facilitate effective use of the Internet in a way that can improve livelihoods of the communities. The importance of infomediaries has emerged as a key success factor for ICT4D initiatives (Duncombe, 2006; Fillip & Foot, 2007; Ramirez, 2001; Ramirez & Richardson, 2005; Schilderman, 2002; Warren, 2007). MSSRF’s use of village knowledge workers, with access to facilities provided by the village resource centres, is one example of how infomediaries can synthesise information from different sources and facilitate contacts between villagers and the outside world.

**Dealing with the Government**

None of the groups presented positive views about dealing with government authorities. The reluctance to deal with these was reflected in reactions when asked how participants would achieve desired changes. The most common response was to approach NGOs. However, in considering whether and how the VSeEC would be useful in achieving changes, many participants appeared keen on using the Internet for contacting the government or obtaining information on different government (funding) schemes. For someone who has had limited, if any, exposure to the Internet, many displayed surprisingly high awareness of the Internet’s potential in dealing with government authorities. This included knowledge about the e-government portal and the Rights to Information Act, both of which enable citizens to deal directly with more senior government officials via e-mail, and access information about government grants and subsidies. There was a perception that community members missed many opportunities for funding due to ignorance of available grants.

Interestingly, while aware of the possibilities arising from access to the Internet, the knowledge about what is available through this medium did not translate directly into an eagerness to learn to use the computers themselves. Many of the participants seemed to be satisfied with using their children as intermediaries between themselves and information. This may well change when Internet becomes available at the centre and adults can experience its power, without intermediaries. Such access could become a catalyst for wider interest in using the Internet, although this would require a certain level of keyboard literacy, which, with its 247 characters, is not easily attainable in Tamil. Other options, including English and Hindi were not viable alternatives, as skill levels in these languages were very low.

There is a role for staff at VSeEC to act as intermediaries for those who cannot rely on family members or acquaintances to access information.

**Indicators**

The question about what indicators to use when measuring progress in achieving desired changes, gave some credence to the CA’s critique of the emphasis on growth and GDP by utilitarian and welfarist approaches to development. Most participants focused on indicators for education and employment. Against this, it can be argued that although the importance attached to indicators on employment levels and types was not explicitly linked to income, such linkage could nevertheless have been implied, at least to some extent. It is interesting to note though that income was raised by participants in one group only and material items arose only in the youth group.
Similarly, education was not explicitly linked to employment and thereby income. In the minds of the participants, there could have been flow-on effects from education to income via employment. But when explaining why education was so important to them, it was clear that it had an intrinsic value associated with empowerment.

Simply knowing the type of indicators the participants would find useful to measure is not enough. As government agencies do not collect this type of statistics, the challenge is now to develop the informational base to enable this analysis to be undertaken. One option being considered for this is to involve the local school community in this activity as part of the curriculum for high school students, possibly in conjunction with tertiary institutions in Tamil Nadu.

**Policy Implications**

The main policy implication to emerge from the meso- and macro-level perspectives is that an ICT initiative such as VSeEC requires a supportive regulatory environment that can deliver adequate infrastructure to the area. The lack of broadband infrastructure has made it difficult for VSeEC to operate as intended. While the absence of infrastructure is a reflection of the telecommunications policy and its administration, a central government responsibility, the different formal meso-level institutions also have a role to play, (e.g. by influencing the government). There was no evidence of elected representatives in the area doing this, so another policy implication is the importance of collaboration between the micro- and meso-levels in representing the interests of villagers. Inadequate representation also manifested itself in the lack of trust in governments, indicated by participants when suggesting they would turn to NGOs, rather than a government authority for support in realising aspirations for their communities. An NGO is limited in what it can achieve in an environment without active government involvement, particularly in providing services that are ultimately the responsibility of the government.

By more actively co-operating with initiatives such as the VSeEC, meso-level institutions could become major resources for their communities, amplifying the contributions made by NGOs, without necessarily incurring expenses. The type of research presented in this chapter could provide input into negotiations with authorities that have power and resources to address the inadequate infrastructure situation.

The results also suggest that the many indicators developed at a global level to measure the information society and which show levels of uptake and activity based on countable items, such as uptake of computers, Internet and mobile services, are not sufficient in themselves. They do not necessarily reflect what is important for the population. Governments and international organisations involved in developing and measuring ICT related indicators should therefore pay more attention to factors associated with effective use and contribution to improved livelihoods.

**FUTURE TRENDS AND RESEARCH**

Although the research conducted so far has provided important insights into the dynamics surrounding the application of the CESVSF to an ICT4D initiative, it would be necessary to undertake similar studies in other areas in order to assess whether this framework is a useful contribution to understanding how ICT can contribute to capabilities, empowerment and sustainability. A more extensive test of the framework would also include other types of ICT4D initiatives to compare the results, including mobile based initiatives. There has been a shift in focus on ICT4D from shared access facilities to mobiles, as these have become increasingly ubiquitous and affordable, over the past few years (Howard, 2008; McNamara 2008; Sey & Fellows, 2009). This may influence methods of incorporating ICT into rural livelihoods.
programmes. Comparisons of CESVSF results between public access centres and individually owned mobile services would provide an important input into policy reviews dealing with what type of ICT facilities to be encouraged and supported in the future to achieve development objectives.

**CONCLUSION**

With reference to the CESVSF, this research has positioned the VSeEC situation at the time of the research at the starting line of the spiral. The VSeEC was building skills that will be useful in mastering the next stage of deployment, which still awaited broadband Internet access. Participants in the focus groups demonstrated an understanding of the potential empowering qualities inherent in these skills.

The importance attached to education and employment provided empirical evidence to support the validity of the CA, as a framework for understanding what is important to villagers. It is not just a theoretical framework, but an approach that is consistent with the ways participants were thinking about their and their children’s lives.

While there were implied links between education-employment-income, education also emerged as having intrinsic value to participants. The intrinsic value was associated with dignity and empowerment, attributes that would enable individuals to “effectively shape their own destiny and help each other [and] need not be seen as passive recipients of the benefits of cunning development programs” (Sen 2001, p.11). Such attributes, important as they are for human development, are ignored in utilitarian and welfare economics, which tend to limit its focus to variables such as income and growth.

In this case, at this time, great importance was attached to measuring employment and education, but other factors may emerge in other places or in the next phase of the VSeEC study. These results indicate that, rather than focusing informational efforts relating to livelihoods solely on economic indicators, data collection should be channeled towards developing an informational base that incorporate indicators that participants consider important for leading lives they have reason to value. Collection of such statistics need not be expensive, as they could be conducted by community members themselves with some support on methodological aspects from the government and other entities, (e.g. tertiary education institutions).

This VSeEC case study has confirmed the limit to what local communities can achieve without supportive meso- and macro-level environments. The lack of Internet access had, at least until the time when the research was conducted, deprived communities of their entitlement to an important source of knowledge and a communication tool, preconditions for being propelled along the CES virtuous spiral.

The study supports the value of a longitudinal perspective when trying to understand the impact of an ICT initiative on communities. For this evaluation to have followed the common approach, which is to study the impact a short time after ‘project completion’, defined as installation of infrastructure, would have given a distorted view of the impact of VSeEC, as it will take some time for the community to understand and realise the potential of this facility. A report prepared to TEWOAF, TEWFI and EWB on this initial research has already encouraged some new initiatives. Had the study been undertaken at the ‘end’ of the project period, usually defined as the expiry of the funding period, it could have been too late to use the constructive input from participants.

The field research methodology, in the form of focus groups, was also found to be useful; both in providing insights that are unlikely to have surfaced in structured survey forms, and in actively contributing to greater awareness and promotion of the VSeEC among its constituency.

The next phases of the research at the VSeEC and other ICT4D initiatives are designed to populate the CESVSF with more empirical evidence.
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to gain a better understanding of the reciprocal relationships between ICT and capabilities.

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**KEY TERMS AND DEFINITIONS**

**Capability and Capability Approach (CA):** Capability in the capability approach means the freedom to achieve valuable beings and doings, i.e. diverse combinations of functionings that a person can achieve. The capability approach is an
economic and philosophical paradigm initiated by the Nobel Laureate in Economics, Amartya Sen.

**Capability, empowerment, and sustainability virtuous spiral framework (CESVSF):** is the conceptual framework underlying the research presented in this chapter.

**Empowerment:** is the process through which individuals and communities take charge of their multiple environments of which they form part, e.g. family, economic, physical, and cultural, in a way that gives them influence and a high degree of control over decisions affecting them.

**Engineers Without Borders Australia (EWB):** works with disadvantaged communities to improve their quality of life through education and the implementation of sustainable engineering projects.

**Micro-, meso-, and macro:** in the conceptual framework, there is no precise definition of these terms. Geographically, micro refers to the village and possibly the next layer, the panchayat and macro refers to the central government and possibly the state government. The importance is to recognise the interplay between the three layers. At the conceptual level, the terms refer to the degree of generalisation. At the extremes micro means that everything is different, so it is impossible to generalise and macro refers to sweeping generalisations that do not take into account any local differences. The boundaries between the meso- and the other two levels are blurred and dynamic, both from a geographic and conceptual perspective.

**The East West Foundation of India (TEWFI):** is the Indian partner organisation of TEWOAF.

**The East West Overseas Aid Foundation (TEWOAF):** is an Australian volunteer driven organisation, with operations in Alamparai, near Kadapakkam, a small fishing village in the southern Indian state of Tamil Nadu. Its main projects are the Uluru Health Care Centre, the Uluru Children’s Home, a coastal eco-education centre, community development programs concentrating on health, the environment and education in the region, and the Vicki Standish e-Education Centre (VSeEC).

**Vicki Standish e-Education Centre (VSeEC):** is TEWOAF’s computer centre located adjacent to the Uluru Children’s home in Alamparai, Kadapakkam, Tamil Nadu, India.