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in Bangladesh

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Operationalising the Capability Approach for evaluating
the contribution of ICT to development at ICT4D project
in Bangladesh.

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Abstract

This paper summarises key points of the Capability Approach (CA), with emphasis on its applicability to evaluation of information and communications for development (ICT4D) initiatives. It explains how this framework has been operationalised for evaluating the contribution to development of an ICT4D project in Bangladesh.

The reason for using the CA for this study is that we consider this an appropriate conceptual framework within which to understand how ICT can contribute to enabling people to lead the lives they have reason to value.

Grounded in human development, the CA offers an alternative to the emphasis on economic development as the sole avenue through which poverty can be alleviated. In contrast to the focus on income and/or consumption in utilitarian and welfare based approaches, the central question in the CA is ‘what they are actually able to do or to be’ (Nussbaum, 2000, p. 12), i. e. capabilities to lead the lives people have reason to value. The CA has had considerable influence on welfare and development economics. It has been embraced by the UNDP and provided the foundation for its human development index (Sen, 2000).

1. Introduction

Impacts of ICT on development have been analysed from different perspectives. At the macro-level, there are econometric studies endeavouring to demonstrate relationships between ICT, economic growth and other economic indicators. At the micro-level, there are evaluations using different frameworks, many of which focus on statistics such as number of users, reflecting an individualist or consumerist model of society (Menou & Taylor, 2006). Whether considering the macro-, meso-, or micro-level, the focus of the CA is always on the capabilities of persons to do or be what they have reason to value.

Developed as a critique of the more prevalent utilitarian approach to evaluation and with emphasis on 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 its lack of operationalisation (Alampay, 2006a; Comin, 2001; Gasper, 2002).

Having evolved since the 1970s, the seminal literature on the CA, "Development as Freedom" ('DAF') was first published in 1999, by the 1998 Nobel Laureate, Amartya Sen (2001). DAF consolidated previous literature on the CA by Sen (e.g. 1980, 1993). Several other authors from different disciplines (e.g. Alkire, 2005; Comin, 2001; Corbridge, 2002; Gasper, 1997; Nussbaum, 2000, 2006; Robeyns, 2001, 2005; Stewart, 2005; Stewart & Deneulin, 2002) have contributed to the development of this framework, both before and following the publication of DAF.

Sen (1982) suggested that the realisation of people's rights to capabilities should be part of a society's goal. Individuals and communities should decide how to define what capabilities are important and how to translate them into functionings, subject to external constraints.

The CA's versatility lends itself to application in diverse fields, e.g. a philosophical analysis of social justice and human rights (Nussbaum, 2003), 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 dispute between different Indian states (Anand, 2007).

2. Constructs of the capability approach

2.1 Freedom, capabilities and functionings

The centrality of the CA is the 'expansion of freedom ... both as the primary end and as the principal means of development' (Sen, 2001, :xii). Development is an extension of freedom and freedoms constitute the basic building blocks for development, together with 'the expansion of "capabilities" of persons to lead the kinds of lives they value - and have reason to value' (Sen, 2001, p.18). Certain capabilities are pre-requisites for the exercise of freedom and freedom in turn

facilitates the building of capabilities. Capability can also be seen as a freedom – freedom to achieve functionings, which describe what a person is actually achieving with his or her capabilities. Personal and external, e.g. institutional factors, affect the ability to convert capabilities into functionings. For example, having access to and knowing how to use ICT represent capabilities, and using these facilities; say to send an e-mail is a functioning. But the capability of sending an e-mail may not be realised, i.e. converted into a functioning for several reasons, e.g. lack of ICT access, lack of contacts, or lack of political freedom to express certain views.

Sen (2001, p. 38) identified five types of instrumental freedoms that contribute to the general capability of a person to live more freely:

- 3 Political freedoms – relate to what is generally associated with democratic rights
- 4 Economic facilities – in addition to opportunities to use economic resources, distributional arrangements of wealth is also an important consideration
- 5 Social opportunities – include access to basic facilities, such as education and health
- 6 Transparency guarantees – involve openness and trust and are important in preventing corruption
- 7 Protective security – provide safety nets, e. g. in the form of transfer payments to afford a minimum standard of living.

2.2 Agency, empowerment, and well-being

The concepts of development, freedom, agency, capabilities, empowerment, and functionings are interrelated central concepts in the CA. Agency involves the freedom of individuals to define and pursue their own objectives. Referring to the capability of individuals to act independently and to decide on matters affecting important life outcomes, agency is central to many conceptualisations of empowerment. Development is about removing various types of “unfreedoms” that constrain individual choice and agency (Malhotra, Shuler & Boender, 2002).

The pursuit of well-being, defined from a utilitarian perspective, may not necessarily be an objective of someone who is more interested in furthering the well-being of others. The CA’s concern over well-being is related to the freedom of individuals to choose how to define well-being and then for there to be opportunities for realising this well-being. In this context, material resources may be important, but only as means to an end.

2.3 Importance of institutions

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. Sen (1985) described this as: ‘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 or others’ (p.216). This means that the CA accounts for impacts at a wider community level.

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 Sen (2001) identified as essential for poverty alleviation. The others are opportunity (access to markets and employment), security (reduction of economic risk and to all forms of violence), and empowerment (external to as well as within households). Achievement of these objectives requires appropriate institutional frameworks at the macro-, meso-, and micro-levels.

3. Informational base of the capability approach

In the CA, the focus of the informational base for evaluating outcomes of development initiatives, is on capabilities that enable individuals to lead lives they have reason to value, rather than economic growth and income. Income and assets are important in so far as they can facilitate desired capabilities. There is still a place for economic variables, such as income and growth, but they are neither central nor ends, justifying means, but rather means to achieving what is valued. In the case of ICT, this means that access to this technology is important, not as an end in itself, but as the means through which someone can achieve valued capabilities. Economic indicators are thus in themselves, inadequate for measuring quality of life and livelihoods. The contribution of political and social freedoms to economic development is not the main benefit of these freedoms. In the CA framework, such freedoms are relevant, whether or not they contribute to development and/or growth, i. e. they are constitutive of development.

Because of its focus on non-income variables, Comin (2001) noted that the CA is particularly suited for micro-level studies. At that level, the CA can generate more relevant findings, as research can more easily analyse people's ability to choose what to do or be.

4. Critique of the capability approach

A common critique of the CA is that it is difficult to operationalise. Listing basic capabilities could be one way to operationalise the framework, thereby making it more useful to development policy. As a vocal advocate of listing basic capabilities, Nussbaum (2003) has developed a tentative list, which she admits must be subject to review over time and in different contexts. Despite insisting that important capabilities be formulated through democratic processes, Sen has, in his practical work nevertheless assumed that there would always be democratic support for certain capabilities. These include 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 has also recognised the role ICT can play in contributing to these basic capabilities.

5. ICT4D and the capability approach

In the CA, access to physical ICT infrastructure would not be sufficient. There is a reciprocal relationship between ICT and capabilities, in that individuals require certain capabilities to be able to benefit from ICT, the use of which is an important capability. 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). The concept of access thus includes capabilities, e.g. (computer) literacy, to actually use the infrastructure, which is similar to "effective use", a concept reflecting 'the capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals' (Gurstein, 2003).

Several studies have applied the CA to ICT, or at least referred to a relationship between these (e.g. Alampay 2006a, 2006b; Barja & Gigler, 2005; Byrne & Sahay, 2007; De', 2007; Garai & Schadrach, 2006; Garnham, 1999; Gigler, 2004, 2008; James, 2006; Kleine, 2009; Madon, 2004; Mansell, 2006; Musa, 2006; Thomas & Parayil, 2008; Walsham & Sahay,

2006; Zheng & Walsham, 2008). A common thread in the literature linking the CA and ICT is the attention given to capabilities of users to benefit from the technology in a way that will achieve the desired functionings.

The CA can be useful for shaping the design of ICT interventions and evaluating them, taking into account interests and perspectives of those involved in such initiatives. For example, rather than treating ICT4D projects as just physical infrastructure, Musa's (2006) modified version of the technology acceptance model (TAM), referred to the relevance of the CA in its focus on the intrinsic value to individuals of such initiatives.

Garnham (1999) analysed the contribution made by communication and media to enhance a range of functionings, using the CA to highlight that both the type of infrastructure and the ability of people to use it should be important considerations.

Informed by the CA, a conceptual framework for measuring information poverty in Latin America suggested by Barja & Gigler (2004), recognised the significant 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 the society, in addition to the need to strengthen the poor's capabilities related to the ownership and use of economic assets. Gigler (2004, 2008) set out to apply the CA in an analysis of two separate initiatives in indigenous communities in Latin America, but did not however interpret the projects within this framework

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. He 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 of a community health information system, Byrne & Sahay (2007) referred to DAF in advocating for a participatory methodology when establishing the informational base for the project and determining how the information collected should be used.

Madon (2004) and De' (2007) used the CA as an evaluative space for assessments of e-government initiatives in India: Akshaya in Kerala and Bhoomi in Karnataka, respectively. Madon, who focussed on functionings that were enabled by this initiative, what people did with these opportunities, and barriers to achieving functionings, found that Akshaya had enabled several capabilities and contributed to the empowerment of women, despite certain barriers. She concluded that it is the 'real opportunities and real achievement of functionings that matters' (p.10), rather than just indicators associated with access and use. Functionings matter for policy formulation, as focus on these enable governments to better balance the priorities of different socio-economic groups.

Focussing on Sen's five freedom types, De' (2007) did not find much evidence that Bhoomi had contributed to these – in some cases, the system instead reduced freedoms. There was no participatory approach to project design to enhance political freedoms. If anything, this freedom may have reduced, by transferring the land record function from the village accountants to remote offices. The economic freedom may have improved for those who could afford the time and money to travel to the Bhoomi offices, but not for the landless farmers. Unlike Akshaya, which provided meeting places, Bhoomi was not designed to improve social opportunities. Although Bhoomi contributed to some reduction in corruption, the system did not provide full transparency freedom, as officers were able to use the system in unintended ways. For example, through information obtained from the system, land speculators were able to exploit the financial distress of poor farmers and purchase their land cheaply, thereby reducing the protective freedom among the most vulnerable.

James (2006) applied the CA, or 'functionings' approach, as he referred to the CA, in exploring the relationship between the Internet and poverty, concentrating on what occurs after the 'point of purchase', i.e. usage, contrasting this to traditional welfare economics, where the focus is on the point of purchase.

In a comparison between villages in Kerala and Andhra Pradesh, Thomas & Parayil (2008) discovered better capabilities to use ICTs and convert information to useful knowledge in Kerala. They attributed this to the more equitable socio-economic development in that state and concluded that access to ICTs does not in itself lead to development, but requires social and political intervention.

Informed by Alsop and Heinsohn's (2005) work on operationalising Sen's work and incorporating elements from the sustainable livelihoods framework, Kleine (2009) developed the 'Choice Framework and applied it in exploring the use of ICT by microentrepreneurs in Chile.

As illustrated in Attachment 1, which contains more detail of the various applications of the CA to ICT4D, the literature on applying the CA to participatory evaluation of ICT4D initiatives is sparse, despite the reasonable body of work related to ICT and CA. Mansell (2006) recognised this when suggesting 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). Heeks (2009) noted that operationalising Sen's ideas on capabilities and functionings with respect to ICT4D, i.e. understanding how ICT can facilitate the realisation of "development as freedom" is 'an as-yet-unfulfilled task' (p.23). Embracing the challenge presented by Mansell and Heeks, the SIRCA research is an attempt to contribute to this, using the five freedoms as entitlements.

6. Operationalisation of the capability approach for SIRCA research

The significance of having contrasted the CA with the more traditional development economics paradigms in this paper is related to the method of choosing the informational base for exploring the contribution of the Bangladeshi ICT4D project to capabilities and freedom. Consistent with the CA, the informational base in this research focuses on what is important for users of the ICT4D initiative and the wider population in the catchment areas of the project, rather than using pre-defined indicators.

The research will centre on the five freedom types identified by Sen (2001), as shown in section 2.1. With the exception of De's (2007) analysis of e-government initiatives in India, none of the applications of the CA to ICT4D presented in Attachment 1, has this focus.

The study will include semi-structured focus group sessions and interviews with users and officials. The focus group sessions will start with encouraging participants to define criteria they would use to define the impact of the ICT4D project. Discussion topics will then centre on the extent to which the project has contributed to the five freedoms in the wider context of how it has impacted on the socio-economic development of respective village. Participants will also be encouraged to discuss whether, to what extent, and how the ICT4D project has affected their quality of life, focusing on its influence on factors of importance from the CA perspective, such as education, health, employment, legal and environmental matters.

Interviews will follow a similar pattern, starting with asking respondents to define what development means to them in the context of the five types of freedom. Tick boxes are provided for the following options: education, good health and better sanitation, recognition in the family, participation in decision making, having rice to eat twice a day, high income and social status, freedom from gender discrimination, and independence (economic, political, and social, which also relates to security). Respondents will then be asked to rate

different sources of information and channels of communication with respect to their influence and contribution to development associated with economic aspects, health, social security, legal protection, political awareness, education, and gender issues, including rights within families. The ICAT4D project will be compared with local/personal communication, and TV/radio.

Issues in the questionnaire related directly to Sen's five freedoms are:

- **Political freedom:** awareness of legal issues, preparedness to play an active role in the planning and maintenance of village facilities, ability to express opinions, participation in setting the agenda for issues related to the welfare of the village, and ability to interact with local government officials
- **Economic freedom:** The ICT4D project's contribution to improving livelihoods of the community and/or family, e.g. in the form of entrepreneurial skills, increasing access to economic resources, including knowledge of alternative credit sources and credit procedures, and market information obtained from the project
- **Social opportunities:** whether the ICT4D project has been appropriated by the community, information sharing within the family and broader community, improvements in leadership and management skills, improvements in social status through use of ICT, how family members view the involvement other family members in the project, and benefits from Gonokendra in terms of health, education, sanitation and marriage system
- **Informational freedom:** ease of access to and ability to process and critically analyse information from the project, ability to produce and publish local content, knowledge of how to collect specific and relevant information, extent of information obtained about government welfare services
- **Protective security:** impact on soil fertility of using chemical fertilisers, mechanisms for obtaining information on the weather and natural disaster warnings, reactions when notified of extreme weather conditions via disaster warnings, views on whether disaster warning systems can help protect the community from natural disasters, how general security is practiced in the neighbourhood.

The research is about perceptions of community members, rather than any 'objective' measures of causality. As other activities contributing to socio-economic development may take place in the villages, it will not be possible to attribute changes only to the ICT4D project.

7. Concluding remarks

This paper has outlined the rationale for adopting the capability approach as the conceptual framework for exploring the contribution made by an ICT4D project to community life. In summary, we consider the CA to a suitable framework for capturing what we expect to be the multi-dimensional influence of an ICT4D project towards enabling villagers to lead the lives they have reason to value.

In addition to providing information about perceptions of the ICT4D project, we expect the research will contribute to the operationalisation of the capability approach.

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Attachment 1. Summary of capability approach applications to ICT4D

Reference	Focus/case study	How CA is applied	Methodology Methods	Findings	Comments
Alampay, E. A. (2006) . Analysing Socio-demographic differences in the access & use of ICTs in the Philippines using the Capability Approach. The Electronic Journal of Information Systems in Developing Countries, 27 (5).	<p>Philippines - individual households in two separate areas: Carmona, an industrialising municipality at the fringe of Metro Manila and Puerto Princesa a city on the island of Palawan.</p> <p>Investigated capabilities of using ICT and functionings, i.e. whether people are able to access and use ICT. The latter is linked to the level of universal access. What people do with their functionings, i.e. frequency and purpose of use was also investigated.</p>	<p>Sen's concept of freedom, pertaining to choice was used to determine capabilities and opportunities to use ICT.</p> <p>Operationalisation of constructs: <u>Freedom</u>: people's preferences and perceived value of ICTs <u>Realised functionings</u>: recent use of ICT <u>Unrealised functionings</u>= "unfreedom", comparison between perceived value and actual use.</p>	<p>One focus group and survey interviews by local researchers. Multi-stage cluster sampling was applied to select households.</p> <p>Interviewees in randomly selected households chosen purposively, alternating between father, mother, and other family members > 12 years.</p> <p>Disproportionate sampling for sufficient numbers in each subpopulation. 250 in each area.</p>	<ul style="list-style-type: none"> • Not everyone with access to e.g. mobiles or computers knew how to use all features, e.g. SMS on mobile or Internet from computers. • Better educated, younger and more affluent segments more capable of using ICTs. • Higher proportions of women were capable of using ICTs. • Limitations of aggregate national statistics in presenting the state of ICT access. • Lack of ownership does not prevent capabilities of using ICTs • Importance of social use contrasted with economic arguments for ICT. 	<p><u>Micro-Macro</u>: Basically a micro-study with reference to macro-policies. The recommendations relate to universal access policies.</p> <p><u>Timeframe</u>: No reference to when the study was conducted, but it was a snapshot study.</p>
Barja, G & Gigler, B-S (2005). The	Develops a poverty line location	Sen's five freedoms are used as the	Defined information and communication	There are no findings, as this is just a	<u>Micro-Macro</u> : As comparisons would be

Reference	Focus/case study	How CA is applied	Methodology Methods	Findings	Comments
concept of information poverty and how to measure it in the Latin American context. In H. Galperin, and J. Mariscal (Eds.) Digital Poverty: Latin American and Caribbean Perspectives, Lima: REDIS-DIRSI.	approach to the measurement of information and communication poverty, emphasising that ICT is a variable included in a group of interdependent variables related to the general issue of poverty.	informational basis for measuring information poverty. Freedoms 'strengthen an individual's capability to participate in the information society; poverty is, from this point of view, the lack of basic capabilities'.	capabilities corresponding to physical, human, social, and economic assets.	description of a framework informed by the CA, but the measuring approach has not been tested.	made between different locations in the same country, rather than between countries, this is a meso-micro approach. <u>Timeframe:</u> Not referred to, but it is assumed that it is intended that the measurements be performed regularly.
Byrne, E. & Sahay, S. (2007). Participatory design for social development: A South African case study on community-based health information systems, Information Technology for Development, 13(1), 71-94.	Participatory design and development of a community-based child health information system in a rural area of South Africa.	'Expansion of health care, education, social security, etc, contributes directly to the quality of life and to its flourishing' (Sen, 1999, p. 144). Sen (1999, p. 44) argues for an informational base reflecting the connection between public expenditure on health care and poverty, e.g. if social benefits are to assist in alleviation of poverty, there is a need to have information on the criteria for the selection of those who	Interpretive case study Action research Participatory approach to developing indicators. Collection and analysis processes were iterative, evolving, and connected cyclically.	Because of the short time the project has been implemented, the findings relate to processes, rather than health outcomes. Community members viewed becoming part of the data flow and developing a community-level information flow as fundamental to their capacity to act. The link to the CA is related to the process for defining indicators, although this point was	<u>Micro-macro:</u> Although reference is made to the Department of Health, this is primarily a micro study. <u>Timeframe:</u> Recognises that ICT is not only about end products, but also process by which they come into being and are redefined over time. Design-evaluation 2002-Nov 2003.

Reference	Focus/case study	How CA is applied	Methodology Methods	Findings	Comments
		should (or should not) receive these benefits.		not made in the paper.	
De', R. (2007) The impact of Indian e-government initiatives, Regional Development Dialogue, 27(2), 88-100.	Seven Indian e-government projects, mainly delivered via kiosks, with special focus on the Bhoomi project in Karnataka. Examine the role of e-government systems in addressing needs of the marginal sections of India's society, particularly women and dalits.	Five Freedoms perspective <ul style="list-style-type: none"> • Political freedoms: did Bhoomi increase political participation? • Economic facilities: did Bhoomi help users access economic resources such as credit, markets? • Social opportunities: did Bhoomi improve access to education, health, justice, information? • Transparency guarantees: did Bhoomi improve transparency of citizen dealings with government? • Protective security: did Bhoomi protect against natural disasters? 	Explored first- and second-order effects. The only information about methodology is: 'This discussion is based on primary data collected by the author and some secondary sources'.	Impact of Bhoomi ICT4D project on freedoms: <ul style="list-style-type: none"> • Political freedoms: citizens not involved in design. Village accountant lost power. • Economic facilities: marginal relevance for landless, poor farmers and for women. Benefits for land speculators • Social opportunities: limited with no access to broader services • Transparency guarantees: limited reduction in corruption • Protective security: some improved access to insurance, but also loss of security for marginalised groups. 	<u>Micro-Macro:</u> Focus on micro-level: individual users <u>Timeframe:</u> No information on when the study was conducted and no reference to secondary data in text. E.g. a study by Lobo & Balakrishnan (2002) on Bhoomi is shown in the reference list, but there is no citation in the text. No reference to capabilities in analysis – only in text, introducing the framework: ' <i>freedoms enable and are enabled by capabilities</i> '.
Garnham, N. (1999). Amartya Sen's capabilities approach to the evaluation of	Focus on inequality "of what" – a conceptual chapter, rather than research.	CA provides theoretical framework for analysing issues such as broadcasting and universal access	No field research is involved. The chapter is a discussion of what policies would be appropriate from a CA	Concluded that it is distribution of social resources making access usable that is important, rather than	<u>Micro-macro:</u> The paper deals mainly with macro-level policy issues, but seen from the perspective of the

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welfare: its application to communications. In A. Calabrese, Andrew & J-C Burgelman. Communication, Citizenship and Social Policy: Rethinking the Limits of the Welfare State. Oxford: Rowan & Littlefield Publishers, Inc., 113-124.	Deals with the concept of entitlements from a CA perspective.	policies. In evaluating ICT policies, the CA moves away from the utilitarian metrics of money and pleasure toward ways of being and doing enabled by ICT and analysis of the barriers preventing people from benefitting from the potential of ICT. This can imply positive discrimination to overcome barriers to equality	perspective.	access. From a CA perspective, there should be measures and indicators that reflect what people in practice can or cannot do with ICT services and benefits derived, rather than measures relating only to access and expenditure.	individual. Timeframe: No reference to timeframe.
Gigler, B-S. (2008). Enacting and interpreting technology: from usage to well-being." In C. van Slyke (Ed), Information Communication Technologies: Concepts, Methodologies, Tools, and Applications. New York: IGI Global, 2464-2494.	Case studies in Venezuela and Peru to explore under which conditions ICT can enhance the well-being of indigenous communities in Latin America. Importance of intermediaries addressed.	Alternative Evaluation Framework (AEF): CA in combination with the sustainable livelihoods framework into which Gigler introduces informational capital. The expansion of capabilities is defined as the strengthening of people's capitals. Advantage of using CA is the emphasis on the ability of ICTs to improve the daily livelihoods.	The AEF is not applied or even referred to in the evaluation of the two case studies, which are mainly descriptions of projects and events, with commentaries.	Relationship between ICT and enhanced well-being is dynamic and multi-dimensional, affected by technology and social context rather than direct and causal. Success of Venezuelan project was partially attributed to role of an intermediary. Failure of the Peruvian project was to a large extent due to the community not having defined its own development priorities before embarking on the	<u>Micro-macro:</u> Refers to broader socio-political context of the countries and international level – e.g. through UN At the regional level – identifies importance of coordination of activities. But AEF is only applied to community level. <u>Timeframe:</u> Describes historical developments over unknown period. .

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				ICT project.	
James, J. (2006) 'The Internet and poverty in developing countries: welfare economics versus a functionings-based approach, Futures 38(3): 337–49.	Analyses two separate studies, one from an African telecentre and the Sri Lankan mixed technology project, Kothmale.	Contrasts traditional consumption theory with the 'functioning' approach, i.e. what happens at the point of purchase with what happens after the purchase.	Uses a data from a 2000-2001 IDRC survey on low telecentre usage and another study on the Sri Lankan Kothmale project. Telecentre model is critiqued. Advocates ethnographic approach to better understand impacts.	Argued that the Kothmale model was more appropriate than the African telecentre model, as it included a mix of technologies.	<u>Micro-macro</u> : both case studies were at the micro-level and no references were made to any other levels. <u>Timeframe</u> : no reference was made to any of them being longitudinal.
Kleine, D. (2009). The ideology behind the technology – Chilean micro-entrepreneurs and public ICT policies, Geoforum, 40(2), 171-183.	<u>Chilecompra</u> : a public e-procurement system – compulsory for government procurement <u>Red Comunitaria</u> , a network of telecentres offering free internet access and training How empowerment, choice, and ICT4D relate to small carpenters in a small village in Chile.	Focus on "development as freedom to choose". Operationalisation based on Alsop & Heinsohn, 2005: focus on agency and empowerment. Choice → →empowerment → →development	In-depth expert Interviews conducted at the national, regional and local level. Two focus groups with public servants and micro-entrepreneurs at the local level. Ethnographic fieldwork - five months participant observation in shops, workshops, offices and at meetings between public services at regional and local levels	Chilecompra made government procurement more transparent, but excluded many microentrepreneurs who had not registered. Too complicated for them. Larger local enterprises had registered but found it difficult competing online with larger companies located in the regional and national capitals. Telecentres improved digital inclusion.	<u>Micro-macro</u> : Both ICT policies at the national level and their impact on the most disadvantaged: microentrepreneurs in a rural town, were included. Also included interviews at regional level. <u>Timeframe</u> : 3 rounds: Jan–Mar 2005, Jul–Aug 2005 Feb–Mar 2006
Madon, S. (2004). Evaluating the	FRIENDS and Akshaya e-	Used the CA as an evaluative space for	Interpretive case study with social constructivist	Usage evolved from IT literacy programmes and	<u>Micro-Macro</u> : Focus on micro-level, but meso-,

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Development Impact of E-governance Initiatives: an exploratory framework. The Electronic Journal on Information Systems in Developing Countries 5, 1-13.	government projects in Kerala, India.	assessments. Analysis of: <ul style="list-style-type: none"> • functionings enabled • what people do with opportunities • barriers to achieving functionings. 	lens. Face-to-face, semi-structured interviews with government officials, local politicians, entrepreneurs, private sector employees and various citizens. Research instrument: set of issues, rather than a fixed schedule of questions. Same people interviewed over time. Additional data through participant observations and secondary sources.	communication with family members to a wider range of applications, e.g. transaction services, e-government, bill payments and banking, dissemination of information in key sectors such as health and education. Gender empowerment: women have somewhere to go.	and macro-level taken into account, as the project was e-government <u>Timeframe:</u> Longitudinal study over 15 months with 6-monthly intervals.
Mansell, R. (2006) , Ambiguous connections: entitlements and responsibilities of global networking, Journal of International Development, 18, 901-913 (2006).	Used OLPC and similar initiatives to illustrate that ICT4D initiatives are not necessarily the best means of responding to the entitlements of users.	Suggested that Sen's (1999) arguments about entitlements can be used to shift the emphasis in ICT4D away from economic assessments of the costs of technology, towards an assessment of the politics of any particular technology solution.	Thematic analysis of an online moderated discussion, 'Measuring the Impact of Communication in Development Projects and Programs', January–February 2005, hosted by DFID, the World Bank, IDRC, etc.	Suggested that one way of ensuring greater participation of the poor in ICT4D would be to evaluate priorities in the light of entitlements as outlined in DAF.	This is not an evaluation of a specific project, but rather a critical analysis of ICT4D practices in general. It includes elements of macro (referring to policymakers) and micro (referring to greater participation of the poor).
Musa, P. F. (2006) Making a case for modifying the	Develop modified technology acceptance model	Used the CA to define a modified version of TAM. Added	Survey questionnaire and structural equation modelling to validate	Found statistically significant relationships between:	<u>Micro-Macro:</u> Reference to importance of

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technology acceptance model to account for limited accessibility in developing countries. Information Technology for Development, 12(3), 213 – 224.	(TAM), which was validated by analysing survey data gathered in Kenya and Nigeria.	accessibility through appropriate technical infrastructure and extent of exposure to ICT. 2-way interaction between individual's perception of socioeconomic environment and accessibility of technology to individuals.	the revised TAM. 450 questionnaires distributed in Nigeria and 150 in Kenya to 'agent organisations'. Response rate 33%.	<ul style="list-style-type: none"> perceived negative impact factors and individual's perception of socio-economic environment individual's perception of socio-economic environment and accessibility of technology accessibility of technology and perceived ease of use ease of use of technology and perceived usefulness 	<p>understanding processes that affect interactions between global, regional, and local levels</p> <p><u>Timeframe:</u> not indicated, but snapshot study</p> <p>Contrasted use of ICT in the entertainment sector in Nigeria with what should have been more appropriate human development application, e.g health.</p>
Olatokun, W. M. (2009). Analysing socio-demographic differences in access and use of ICTs in Nigeria using the capability approach. Issues in Informing Science and Information Technology, 6.	Analysis of socio-demographic differences in access and use of different types of ICTs in rural and urban communities in Nigeria	Used Alampay's framework for the capability approach. Separated analysis into capability of using and realised functionings translated into actual use.	Survey of 500 respondents in randomly selected households in two locations. Purposeful sampling within households, alternating between father, mother and others >12 years. Structured questionnaire. Chi-square analysis to determine significant factors affecting access and use of ICTs.	Found differences in capabilities of using different types of ICTs based on gender, education, and location (urban vs rural), age, and income levels.	<p><u>Micro-Macro:</u> Macro referred to in the context of policy implications of the findings.</p> <p><u>Timeframe:</u> Not mentioned when study was undertaken, but only one snapshot.</p>
Thomas , J. &	Links between the	CA is used to interpret	Sratified sample survey	Capabilities to use ICTs	<u>Micro-macro:</u>

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Parayil, G. (2008). Bridging the social and digital divides in Andhra Pradesh and Kerala: a capabilities approach. <i>Development and Change</i> , 39 (3), 355 – 512.	digital divide and larger social and economic divides. Akshaya in Kerala and Kuppam in Andhra Pradesh (AP)	empirical research results to answer how socio-economic differences in Kerala and AP affect capabilities to use ICTs and information provided by ICTs among rural populations of the two states.	of 45 households for each of the projects.	and convert information to useful knowledge higher among sample households in Kerala than AP. Higher proportion of less educated users in Kerala. Conditions for agricultural growth more favourable in Kerala→ greater demand for info on agriculture. Digital divide is part of a larger developmental problem in which the poor are deprived of the capabilities to use ICTs, acquire information and convert information into useful knowledge.	The three levels incorporated: central government policies, state policies and surveys at the micro-level <u>Timeframe:</u> July–August 2004
Tiwari, M. (2008). ICTs and poverty reduction: user perspective study of rural Madhya Pradesh, India, <i>The European Journal of Development Research</i> , 20(3), 448 – 461.	Impact of Gyandoot in Dhar District, Madhya Pradesh	The conceptualisation of poverty is based on the CA. Poverty reduction impacts are therefore considered both in terms of economic dimensions, such as the expansion of the employment potential, and non-economic dimensions, such as improvement in education, health and the living environment.	Surveys of 100 households with users and non-users from 3 economic groupings. Primary data set comprising two categories: quantitative on household members' literacy levels, livelihoods, assets and other indices. Semi-structured, open-ended	The only service with reasonable uptake was land records, an entitlement enabling service. Also noted benefits of public-private partnerships in the Gyandoot structure – encouraging entrepreneurship in local economy.	<u>Micro-macro:</u> State context in terms of literacy rates <u>Timeframe:</u> No timeframe for the study was provided

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			interviews on usage and views on Gyandoot and understanding of poverty and its causes.	But gap in perception of how Gyandoot services can facilitate wider entitlements and capabilities of being educated, skilled, healthy and overall well-being.	
Walsham, G. & Sahay, S. (2006). Research on information systems in developing countries: current landscape and future prospects. Information Technology for Development, Volume 12(1)	This is an overview of literature dealing with ICT and the only reference to the CA is in a recommendation for future studies.	NA	NA	NA	Suggested that evaluation of ICT in developing countries could be broadened by wider definitions of development, e.g by exploring how freedoms of opportunity and choice can be extended using ICT.
Zheng, Y. & Walsham, G. (2008). Inequality of what? Social exclusion in the e-society as capability deprivation. Information Technology & People, 21(3), 222-243.	Social exclusion in the e-society from the human development perspective. Empirical studies of health systems in South Africa and China. <ul style="list-style-type: none"> • What capabilities are essential in the e-society? 	Social exclusion as conceptualised as capability deprivation, affecting well-being and agency freedom. Conversion from commodities to capabilities, i.e. the opportunity set of achievable functionings, rather than the actual	Interpretivist study. <u>South Africa:</u> participative observation, 8 interviews with officials and hospital staff and one focus group with 15 hospital staff. <u>China:</u> Primary research data through participant	Demonstrate relational features of social exclusion and different types of capability deprivation “unfavourable inclusion” which can be masked by technological diffusion. South Africa: ineffective mobilisation and exploitation of health	<u>Micro-macro:</u> Implications for government policies, which should consider socio-political, cultural and institutional aspects for effective use of ICT. <u>Timeframe:</u> South Africa: two cycles for a total of

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	<ul style="list-style-type: none"> Who may be disadvantaged when deprived of these capabilities? 	<p>choice of realising those opportunities.</p> <p>Illustrate how social exclusion can manifest in different forms under different conditions, as deprivation of different capabilities.</p>	<p>observation, semi-structured interviews, and questionnaire surveys. Also secondary data on SARS.</p>	<p>information due to low literacy levels and insufficient attention to cultural factors contributed to capability deprivation of staff.</p> <p>China: health workers deprived of agency freedom - not able to communicate effectively with other health workers, be informed of an epidemic and perform their health care role effectively.</p> <p>Public deprived of freedom to participate in public affairs → deprivation of well-being freedom by being exposed to SARS.</p>	<p>two-and-a-half months</p>