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ICT Initiatives, Women and Work in Developing Countries: *Reinforcing or Changing Gender Inequalities in South India?*

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2004

Abstract[+]

Information and communication technologies (ICTs) are increasingly used by developing countries in strategies that see the new technology as having the potential to deliver economic growth, employment, skills generation and empowerment. There is growing agreement, however, that the impact of ICTs in developing countries is not gender neutral, necessitating an engendered approach to ICT-based projects. This paper argues that ICTs as a form of new technology are socially deterministic, with varied implications for women in terms of employment and empowerment dependent on the context within which the ICTs are utilised. The paper presents findings from two ICT initiatives in South India showing significant impacts on women's employment, income and social roles. One ICT initiative – "gender-blind" and pursued within the globalised, competitive context of an increased role for markets and 'flexibility' – has generally reinforced gender inequalities. By contrast, a gender-focused ICT initiative involving significant state intervention has brought about positive changes to livelihood outcomes and empowerment of poor women.

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Introduction

The development of a global "information society" has largely been characterised by the diffusion of various information and communications technologies (ICTs). While the notion of information societies is contested, there is a clear sense of disparity between the industrialised nations, with educated populations, excellent telecommunication infrastructures and growing service sectors, and the developing countries which mainly lack these information society components (Lim, 1999; Castells, 2001). Fearful of missing out on the opportunities provided by ICTs, developing countries have therefore been adopting information society strategies, placing an emphasis on both the production side (hardware manufacture, software development, etc) and on the consumption side (e-commerce, e-government, etc) (Singall and Rogers, 2001; Heeks, 2002).

Arising from this growing use of ICTs in developing countries have come a series of studies and findings. Some have been largely optimistic and gender-neutral, seeing the contribution that ICTs can make, for example, to economic development generally or to poverty alleviation specifically (Wakelin and Shadrach 2000; Cecchini, 2002; Kenny, 2002). Other findings, though, have been more nuanced, seeing technology as socially-contextualised and thus, for example, as gendered with differential barriers to access and use of ICTs by men and women (Hafkin and Taggart, 2002; Huyer and Sikoska, 2002; Wambui, 2002). This, in turn, has led to identification of a gender dimension to the "digital divide" and to concerns that ICTs will be applied in ways that maintain or even exacerbate existing gender inequalities (Jorge, 2002; Marcelle, 2002).

In seeking to understand these issues in greater detail, this paper focuses on experiences of ICT application in India. India was selected for two main reasons. First, because it has for many years given a significant priority to ICTs both on the production side (as seen, for instance, in the development of its software industry) and on the consumption side (with significant investments in e-government applications, and attempts to push ICTs out into rural areas) (Heeks, 1996; Bhatnagar and Schware, 2000). Second, because application of ICTs has taken place through a variety of

different models; for example, from pure market to pure state, and from gender-blind to gender-focused (Singall and Rogers, 2001). India therefore provides a valuable source of data for other countries seeking to journey towards the "information society", and concerned about the gender consequences of this journey.

Because India is an entire sub-continent in itself, this paper focuses down even more tightly to look at experiences in one South Indian state – Kerala – that can be seen as a microcosm of the ICT experience in India. On the one hand, Kerala has caught on to the coattails of India's "software boom" (Dayasindhu and Pradeep, 2003), and can be investigated to see how demand for software labour has impacted women's paid employment in the mainstream ICT sector. On the other hand, Kerala has also played host to a number of innovative state interventions in ICTs, including *Kudumbashree*, a women-led poverty reduction programme that has made use of ICTs to enable the development of ICT-based enterprises run by cooperatives of poor women.

These two contrasting experiences will be used to explore differences between ICT projects that take a market-led, gender-neutral approach and those that take an interventionist and gender-focused approach. In order to do this, a qualitative and case-based approach was taken involving two periods of fieldwork in Kerala, during 1998-99 and 2004. During both periods, interviews were conducted at three main levels: women workers, managers (both men and women), and policy-makers (both men and women). Documentary analysis was also undertaken, ranging from government records to annual reports of enterprises. Observational periods were also spent in a small number of organisations. Some further details of data gathering are presented below.

The paper is structured as follows: Section A examines some of the debates relating to gender, ICTs and development; then Section B proceeds to examine the ICT context in India generally and in Kerala specifically. Section C examines survey research findings on women's employment in private sector software production, which can be contrasted with Section D's presentation of findings from the state-led Kudumbashree project. Final conclusions are provided in Section E.

A. Gender, Work and ICT

Feminist scholarship has pointed out women's unequal relation with technology, including ICT, as gender relations often determine the use and impact of technologies. Wajcman (1991:28), for example, argues that "though new technologies do represent a force for change … the outcomes are constrained by the pre-existing organization of work, of which gender is an integral part". Likewise, Wambui (2002) notes that barriers to effective use of ICTs in developing countries are a microcosm of existing gender relations in societies where women are socialised towards non-technical careers and away from technical work such as software development.

Despite this gender bias in the characterisation of men's and women's work, women have not been excluded from the ICT sector. Wambui's observations, for example, refer particularly to Africa whereas, in India, women have been an important part of the ICT workforce. Equally, research in industrialised countries has noted the feminisation of software production with a higher and increasing representation of women (Wright and Jacobs, 1994). Nonetheless, the contextual force of existing gender relations continues to exert a strong influence on the relation between women and technology in ICT-related work. The emergence and progressive reinforcement of a masculine culture in this field has been emphasised (Tierney, 1995; Wright, 1997). Studies have also found that in the software industry, women work as operators or programmers in the non-managerial group, while men are predominant in managerial positions of project leaders or departmental managers (Panteli et al, 1997).

Feminists in Western countries have explained such outcomes partly by focusing on the gendered nature of the concepts of skill and technology due to flexible specialisation, where flexibility is a process of economic restructuring driven by technological change, by increased globalisation and by growing marketisation that involves a drive towards a greater variability of skills, hours and contracts in the labour market and, in some sectors, a downward pressure on rights, wages and conditions (Cook, 2000; Walby, 2000). Two forms of flexibility have been identified in relation to employment: functional, which is the ability of firms to transfer labour between tasks and break down job demarcations; and numerical, which is the ability

to adjust the number of workers they employ to correspond with the demand for labour and goods. Competitive market pressures have driven forward the growth of these flexilibities resulting, for instance, in the creation of low skilled and insecure jobs for women reflected in growth in the European context of practices such as home working and part-time working (ibid.).

Such findings, though, relate almost entirely to industrialised countries. One can see the triad of technology, globalisation and marketisation come together in the Indian context to drive on the growth in call centres and in business process outsourcing: eulogised as the epitome of innovation and flexibility, these business activities are mirrored by the stress, insecurities and vulnerabilities of the employed workers; reflected in concerns about high attrition rates and gender implications (Ramesh, 2004). Nevertheless, in general terms, relatively little has been researched or written about the specifics of gender relations in the ICT sector in developing countries, and it is this knowledge gap that this paper partly addresses.

If the private sector and the market produce gender concerns in relation to women, ICTs and development, what of ICT projects driven by government or NGOs? Certainly hopes have been high that ICT projects can play an important role in reducing gender inequalities (Balakrishnan, 2002). Of course, there is a recognition that existing gender relations do have a strong influence – under "normal" conditions women will find themselves facing barriers of unequal access to ICTs, and unequal access to the benefits of ICTs (Huyer and Sisoska, 2002). Hence, the clear guidance on good practice for ICT project interventions from the micro-level of participatory assessment of needs to the macro-level of gender-sensitised policies on infrastructure (Jorge, 2002).

However, even here there are concerns about the gender-blind nature of some interventions (Bonder, 2002), and – as with market-led ICT production – the problem remains of relatively limited work based on actual experiences in developing countries. With this in mind, we now move on to outline the context for the cases to be reported in this paper.

B. The ICT Context in India and Kerala

As just noted, the context within which ICTs operate strongly influences – even determines – their impacts, including gender impacts. This section therefore sketches out some aspects of the generic context for our cases; both the general context of India and the specific context of the state of Kerala.

Shaped by economic liberalisation and privatisation, the informatisation strategy in India since 1991 has seen moves such as the de-licensing of the electronics industry and liberalisation in foreign investment and trade policies. The software and services component of the ICT sector has emerged as one of the fastest growing industrial segments, increasing from US$170-million worth of output in 1991-92 to US$8.8billion in 2003-04 (Heeks and Nicholson, 2004). Operating within a competitive business environment, with successful networking with overseas entrepreneurs and supportive government policies, the software industry benefits from impressive human capital and has gained a sustainable competitive advantage. In response, leading global software companies have set up subsidiaries and joint ventures in India, and many more local entrepreneurs have started software companies (Bajpai and Sachs, 2000).

Spurred on by this, many governments in the individual Indian states have initiated micro reforms to attract more investment in the ICT sector to their respective regions. The Government of Kerala state (GOK) in South India is no exception and it has developed policies that emphasise ICTs as an engine for industrial growth and employment. The state's ICT policy in this domain articulates a three-fold strategy: (1) establishment of a vibrant ICT industry; (2) building up a robust infrastructure; and (3) upgradation of the quality of human resources (GOK, 2003).

All three of these were brought together in the creation of the state's "TechnoPark" at Trivandrum as an identified location for ICT-based enterprises. It was India's first technology park and remains among the largest in India, hosting over 50 IT and information technology-enabled service companies which employ some 5,000 IT professionals (TechnoPark, 2004). These firms are active in a range of software-

related activities including production of business applications, Internet technologies, embedded systems, animation and Web technologies. The dominant field is software production and maintenance for large foreign and domestic clients covering a range of sectors (finance, retail, healthcare, telecommunications), innovation (from conversion of old "legacy" systems to design of new e-commerce solutions), and skill levels (from basic programming to complete "turnkey" projects) (Arun and Arun, 2002).

The firms operating in the TechnoPark are private sector; mostly either subsidiaries or joint ventures of foreign companies or larger domestic firms headquartered elsewhere in India. The government's policy actions in enabling development of the TechnoPark are therefore seen as market-oriented – the government plays no direct role in the park such as customer or supplier – and also as gender-blind, since there has been no specific consideration of the role of women.

The Government of Kerala's ICT policies stretch beyond this, however, and beyond gender-blind, market-oriented initiatives to direct ICT project interventions that tap into the broader range of relations between ICTs and enhanced social and economic development. Table 1 shows some of these project initiatives that link ICTs with state policies on governance, poverty alleviation and public service delivery. One area of emphasis (IT@School) is on increasing IT literacy in the state by promoting use of IT in the school curriculum: training of teachers and supply of IT hardware. In line with e-governance projects in other Indian states, initiatives such as Package for Effective Administration of Registration (PEARL) and Fast Reliable Instant Efficient Network for Disbursement of Services (FRIENDS) enable citizens to access a number of public services such as payment of bills through computerised networking systems. Akshaya, a recent initiative by the Kerala State's IT Mission, aims to act holistically, by providing skills, information and services to citizens. In all of these the state has a direct ownership and/or delivery role.

Table 1: State-Intervention ICT Projects in Kerala

Name	Programme and objectives	Location/level of implementation	Intended impacts
FRIENDS	Payment of bills	Capital city	Transparent administration, access to services
PEARL	Registration of land	Capital city	Transparent administration; access to services
Project Grameen	Education of local citizens and formulating grassroots programmes	Local council (Panchayat)	Employment, empowerment and increased local participation
Information Kerala Mission	E-governance	Local council (Panchayat)	Increased participation and empowerment
Akshaya	Providing e-services	Malappuram District	Governance, employment, participation, participation
Kudumbashree	Poverty alleviation scheme through women's self-help groups	State-wide	Self-employment, empowerment and poverty reduction
IT@School	Learning and teaching	All Kerala Government schools	Training and education

Source: Adapted from GOK (2003)

Our focus here, though, is the Kudumbashree initiative, selected because of the contrast it provides to the TechnoPark project. Not only does it rely strongly on government intervention, but it is also strongly gender-focused. *Kudumbashree* – which means 'prosperity of the family' – is an initiative of the Kerala State Poverty Eradication Mission (SPEM) which was launched on 1st April 1999 as a women-oriented, participatory and integrated approach to fight poverty (GOK, 2003). Families below the poverty line are identified by a multi-dimensional set of indicators based on non-monetary factors. Neighbourhood Help Groups (NHG) or *ayalkootam* – a type of cooperative of ten women – are formed as the basis for each Kudumbashree unit and they then operate in a multi-functional mode: partly as an enterprise aiming to increase employment and ensure stable income for the women, but also as micro-finance organisations in the form of thrift societies, and as self-help groups for discussion and action on issues such as health and nutrition.

The enterprise side of the Kudumbashree units can take many different forms (for example working in clothing production or in processing of agricultural produce).

However, one of Kudumbashree's most innovative aspects has been its use of ICTs to form the basis for some of its enterprises. This has been innovative in its instigation – very rarely has any attempt been made to enable poor women to make direct use of ICTs – but also in its outcome: as seen below, the ICT-based enterprises have now been operating successfully for five years albeit that the majority of their work is drawn from government or other public sector sources.

Before moving on to discuss the two main cases – TechnoPark and Kudumbashree – some mention must be made of the more general Kerala context. Kerala rates relatively highly – as least compared with other Indian states – on various social development indicators (Franke and Chasin, 1994; Parayil, 2000). The sex ratios are in favour of women in the sense that for every 1000 males there are 1036 women in Kerala, women have a greater life expectancy, and there is acceptance of the small family norm. More generally, levels of education and measures of strength of civil society are relatively high. Some therefore talk of Kerala having a very particular model of development based on specific institutions, interventions and historical processes (Tornquist, 2000).

While certainly recognising the specificities of any particular context, we would make two points. First, the nature of the generic Kerala context does not particularly interfere with our attempt to compare the two different types of ICT-related intervention since it is the contextual differences between the approaches that are seen as a main determinant of differences in outcome. Second, the Kerala context has not placed it outside the mainstream in many ways. For example, the economic marginalisation of women in Kerala has drawn considerable attention as a process providing an impediment to improving the status of women (Kumar, 1994; Arun and Arun, 2001). As one instance, while the female work participation rate in India increased from 19.7% to 22.7% between 1981 and 1991, in Kerala the ratio declined from 16.6% to 15.9% (GOK, 2003).

C. Market-Oriented and Gender-Blind Approaches to ICTs and Gender: Flexibility, Insecurity And Inequality in the TechnoPark?

As noted above, the creation of the TechnoPark was a "market-friendly" initiative. We studied it through a survey of 110 software professionals from twenty TechnoPark software firms, each of which employed between ten and 300 workers.[1] The survey sample was classified on the basis of work experience into three groups:

- Category A: those with more than five years' software development experience.
- Category B: those with two-five years' experience.
- Category C: those with less than two years' experience.

A summary of their views on some work-related issues is presented in Table 2 (Arun and Arun, 2002); these and other findings are discussed below.

Table 2: Perceptions Of Work Practices and Prospects in Software Production in the Kerala TechnoPark

	Category A		**Category B**		**Category C**		**Total**	
Agreement with statements about software production	Male	Female	Male	Female	Male	Female	Male	Female
Provides increased economic prospects	18 (*69%*)	2 (*40%*)	8 (*73%*)	27 (*63%*)	10 (*91%*)	8 (*57%*)	36 (*75%*)	37 (*60%*)
Appraisal systems are crucial to performance and pay	20 (*77%*)	2 (*40%*)	6 (*55%*)	12 (*28%*)	10 (*91%*)	9 (*64%*)	36 (*75%*)	23 (*37%*)
Nature of skills in the workplace are changing	24 (*92%*)	4 (*80%*)	9 (*82%*)	40 (*93%*)	9 (*82%*)	10 (*71%*)	42 (*88%*)	54 (*87%*)
Increased flexibility and skill development are offered	12 (*46%*)	1 (*20%*)	6 (*55%*)	12 (*28%*)	10 (*91%*)	8 (*57%*)	28 (*58%*)	21 (*34%*)
Work practices affect domestic responsibilities	20 (*77%*)	4 (*80%*)	9 (*82%*)	40 (*93%*)	4 (*36%*)	7 (*50%*)	33 (*69%*)	51 (*82%*)
Require more social welfare measures	23 (*88%*)	3 (*60%*)	8 (*73%*)	37 (*86%*)	6 (*54%*)	8 (*57%*)	37 (*77%*)	48 (*77%*)
Total	**26** (*54%*)	**5** (*8%*)	**11** (*23%*)	**43** (*69%*)	**11** (*23%*)	**14** (*23%*)	**48** (*44%*)	**62** (*56%*)

[1] The sample was representative in terms of firm types, level of employee experience, and most other work-related factors. However, it was not completely representative in terms of gender – 56 per cent of the selected sample were women, compared to an average 40 per cent of the software workforce in the Technopark overall.

On the positive side, employment rates for women in the surveyed software firms (c.40 per cent) were high relative to software industry averages in India (c.20 per cent) (Bajpai and Sachs, 2000). This seems to have been driven by a relatively gender-blind high demand for software labour caused by the competitive nature of the industry plus high participation rates for women in Kerala in relevant education. Managers in the surveyed firms thus stated that they were keen to recruit professionals, irrespective of gender, with the necessary expertise or potential in engineering and computing.

Employment in software production also brought considerable economic benefits: on average, basic monthly salaries for both women and men were up to two or even three times higher than comparable non-ICT work categories in both private and public sectors. There was thus a general perception – rising with experience in software – that the software sector provided better economic rewards than other sectors.

However, in other ways, the competitive and marketised nature of work in software had facilitated the reproduction of existing environmental gender relations. Work in the software firms necessitated a particular set of competencies identified by project managers: IT skills, English language skills and client sector knowledge but also capacities including team working, ability to work under pressure, and ability to work flexibly.

For some of these skills – such as those related to technology, language, or team working – no immediate gender differences in relation to work practices could be detected, although women were less likely to perceive skill development opportunities within their workplace than men. However, within the notions of 'working flexibly' and 'working under pressure', there were some clear differences. Discussions showed that these notions contained within them assumptions that staff in firms offering consultancy services (the majority) would travel frequently and at any time for the upgrading and maintenance of software systems. They also contained the assumptions that staff would work long – even continuous – hours in order to finish projects on time.

For women, burdened still with traditional expectations of particular roles in family and in society, meeting those expectations was harder than it was for men. All of this had a knock-on effect since these expectations were built into appraisal and promotional systems, both of which are important determinants of the impacts of work (for example, in addition to basic salaries, pay and economic rewards were based on periodical appraisal, which led to differences in pay between employees).

Because of the gendered assumptions built into competency requirements and, hence, appraisal and promotion, gender differences in attitudes towards these systems were evident. Around 75 per cent of men felt the appraisal system was fair; only about half that proportion of women agreed. Women felt that performance depended on individuals and ethos rather than objective systems of appraisal. Procedures were secretive and subjective, and therefore – in an industry where senior managers are predominantly male – the potential for both a perception and a reality of gender bias crept in. Women were more likely to rate appraisal systems as stressful, and even among category C respondents (who were generally positive towards appraisal), women were significantly less likely to view appraisal positively than men, particularly in terms of its economic benefits. Thus, while initial basic pay rates may be relatively equal and while salaries may be high for women compared to work in other sectors, appraisal systems can still have a tendency to create divergence between the economic benefits to men and to women.

The same could be seen in relation to the system of promotions, which had helped create a situation in which women were significantly under-represented at the higher echelons of software firms. For instance, despite the survey's slight skew of subjects towards women, only two women in the survey were project leaders, compared to eighteen men.

Women were also less likely to perceive benefits in the notion of flexibility than men, partly because this notion was translated into systems of work on contract or temporary basis that were only renewed when firms were able to obtain further software contracts from foreign or local clients. Flexibility was also translated into particular patterns of work. Normal working hours were eight hours per day for six days a week. However, employees from all categories felt they spent more time than

this in the workplace, largely because of tight project deadlines and the need to put in extra hours to meet those deadlines.

Both men and women with children and with other domestic responsibilities found these market-driven work practices to be stressful, particularly as teams worked in an extremely competitive way to finish projects before deadlines. However, the stress of work—life balance seemed to fall disproportionately on female rather than male software staff. As one reflection, around 82 per cent of women felt that domestic responsibilities were affected by the longer working hours, whereas only 69 per cent of men felt the same. Respondents reported that, when someone was sick at home, it was women who typically took time off from work. Similarly, many women discontinued software work on becoming pregnant or having children as no support was provided, and they were unable to undertake roles both in the home and the workplace without such support.

For those women who continued (or began) working in software after having children, additional support was the major factor enabling continuity of work. In many cases, this support was met by help from other family members (typically themselves women). In other cases, though, what had been seen traditionally as a family-bound role had itself been marketised: female software staff were relying on increased levels of paid domestic help (further reducing their net income, especially because domestic labour in the city was costly), and some had resorted to paid private tuition for their children, as they themselves did not have time to help the children with their school work.

Finally, the implications of market-based job flexibility worried women because of their concerns about long-term income security; generally absent in the software sector where employees were typically expected to make their own pension or provident fund provisions.

In some organisations worldwide, some of these issues can be addressed or mitigated by the presence of particular policies and practices – such as flexible office hours, working at home, adequate maternity or paternity leave, and childcare facilities – and/or by the presence of particular institutions, such as workplace unions. These can

often have a disproportionately greater positive impact on women than men. Their absence in the software firms studied had a correspondingly negative gender-skewed effect.

D. Interventionist and Gender-Focused Approaches to ICTs and Gender: Empowerment Through Kudumbashree's ICT-Based Enterprises

In contrast to the TechnoPark initiative, Kudumbashree involved significant and direct state intervention that was gender-focused. Data gathering included substantial semi-structured interviews with four state officials involved with the project. In addition, interviews and observations were conducted with ten members of Kudumbashree ICT-focused units. Analysis of statistical and qualitative data provided by Kudumbashree ICT units was also undertaken.

In all, 1,206 Kudumbashree units are now operational in a range of sectors (Kudumbashree, 2004). As noted, all are cooperative enterprises owned, managed and operated by women from poor families and, among these units, there are three types of ICT-based enterprise:

- 45 are IT training units which provide IT training to schools;
- 56 are data entry and digitisation units which mainly create local digital content for public (and to a lesser extent private) sector organisations, but which may also do some other IT work; and
- 5 are hardware assembly/maintenance units.

Some – particularly the data entry units – are attempting to move up the value chain into basic software and Web development work. A short case example of one ICT-based unit is provided in Box 1.

Box 1: Example Kudumbashree ICT Unit

Technoworld Digital Technologies (TDT) is a Kudumbashree ICT unit initiated in 1999 by ten women from below-poverty-line families who provided US$300 of their own money, which was matched by a US$3,000 bank loan and a US$2,500 local government subsidy used to purchase a basic computing set up. Their total asset base had risen five-fold by 2004 to a system of 22 computers plus computing peripherals worth US$30,000.

The unit mainly undertakes data entry work for state government departments under the government's digitisation programme. It has undertaken work such as CD rewriting and some Web site maintenance, and it also provides IT training to a number of government schools. Work patterns are based on two main shifts (7.30am to 1pm, and 1pm to 6.30pm), and forty additional staff have been employed over and above the original ten women members, including a number of men.

Source: Interviews and TDT (2003)

As in the TechnoPark, there has been a sizeable employment impact, with the ICT units creating jobs so far for 2,000 women. Initially c.US$30 per month was set as the income for each member in the ICT units contacted but today c.US$50 is being earned by each member. In addition to this, loans for various purposes have been approved within the groups and surplus funds are being diverted for reinvestment in the business. Therefore women have built these small enterprises into sustainable income livelihoods. In addition, as seen in the Box 1 case study, the Kudumbashree units are also generating jobs and enterprise-based incomes for a significant number of other community members.

One of the TDT unit members interviewed, Janu, specifically reflected on the relative merits of Kudumbashree vs. TechnoPark work: 'initially my family was concerned about the financial sustainability of the project, compared to a secure paid employment in related computer firm … they preferred that I work in the TechnoPark, but with the recent slump in the IT industry and associated insecurities related to employment has changed this, most probably the thriving nature of our project has instilled confidence in self-employment as a viable livelihood'.

Most of the women contacted to date – although unemployed prior to their involvement with Kudumbashree – do possess high levels of human capital in terms of educational qualifications and further technical training. However this initiative

has provided them with important additional competencies because they have had to take on roles traditionally the preserve of men. Another TDT member, Meena, summed up this impact: 'of course you may earn slightly more in paid employment but we have attained increased levels of both personal and professional skills ranging from human resource management, marketing, personal skills, not to mention the flexibility that this livelihood permits'. In this case, then, flexibility is not an external factor imposing constraints on women's lives, but something inherent and controlled by the women themselves.

There is also a genuine perception of the women themselves that they have been empowered; and have at least partly achieved a break with pre-existing gender relations. This is seen partly in the capacity of women to take on all of the managerial roles required in an ICT-based enterprise, and in their ability to grow the enterprises in both employment and asset terms. It is particularly seen in the capacity of the women to hire and manage men as employees. This empowerment has already had broader impacts, with a number of women from the units having been elected as local government councillors.

It must be recognised that development of the Kudumbashree IT units has required a significant degree of institutional support from government departments, banks, other financial intermediaries, and other local organisations. This is a reminder of the downsides of interventionist ICT projects – they may rely strongly on the interventions and find it difficult to sustain themselves without ongoing intervention and support. On the other hand, one should also see this as a two-way process: the institutions have helped the women's enterprises develop but, simultaneously, those institutions have themselves developed. In particular, they feel they have now developed a much better understanding of the livelihoods and needs of women in poor communities.

E. Conclusions

Persistent gender disparities in developing regions such as South Asia, the Middle East and sub-Saharan Africa need to be tackled. Not surprisingly, the 2000 UN Millennium Development Goals include gender equality and empowerment as one of the eight key goals, seen both as an end and means to achieving social and economic development. There is thus growing interest in ways in which ICTs may be used to help deliver on this goal, but there are different approaches to using ICTs in order to achieve this.

This paper has presented two case studies from South India that reflect two of the possible approaches: a market-oriented and gender-blind approach that enables the competitive forces to exert an effect, and a state-led approach that deliberately and concertedly intervenes with a specific focus on gender. The two cases are drawn from the same geographical area, involve women with relatively similar educational qualifications (albeit drawn to some extent from different economic groups), and involve activity falling broadly within the ICT sector. Because of their differences, they cannot provide an exact, like-for-like comparison suitable for quantitative hypothesis-testing. Instead, they provide the basis for a qualitative and exploratory investigation of the ways in which the two different approaches do or do not lead to a reproduction of the existing – and unequal – gender relations that exist within the case environment.

The first case, that of Kerala's TechnoPark shows that "market-friendly" ICT initiatives readily draw in the forces of globalisation and competition. This undoubtedly bring short-term benefits to women in relation to employment and income. However, these same forces – supposedly gender-blind according to managers – have been translated into requirements for flexibility and workloads that reinforce gender inequalities even in a sector that is new and which employs a high proportion of women.

This has not been the case with the highly interventionist ICT initiative, Kudumbashree. Intervention certainly has its disadvantages and – despite the

existence of these ICT-based enterprises for five years – questions are still raised about sustainability. However, they do illustrate the capacity for a quite different approach – one that is gender-focused, locally-owned and participative – and for rather different outcomes. While the incomes generated in the short-term may not be as great as those in the market-oriented approach, their stability and sustainability has been greater with flexibility seen as an internally-generated virtue rather than an externally-imposed vice. The range of competencies developed is considerably greater than that seen in the market-oriented approach because women have been allowed to break out of the traditional stereotypes of inequalities of power and responsibility between "women's work" and "men's work". They have thus been able to make at least a start on breaking down some of the social, political and even institutional bases of gender inequality.

The interventionist approach to using ICTs for women's development – as represented here by Kudumbashree – is by no means a panacea. It arises from a particular set of institutional arrangements and political priorities that cannot be wholly transplanted to other contexts. Nonetheless, the contrast in gender-related impacts between this and a market-oriented approach to ICTs within the same context is notable, suggesting that lessons can be learned for other ICT projects about the value of gender-focused, interventionist approaches.

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