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**ICTs and Poverty Reduction: User perspective study of rural Madhya Pradesh,
India
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Abstract

This paper presents findings of a user perspective study on the impact of ICTs in rural India. The study is based on primary research conducted by the author in Dhar district of Madhya Pradesh, India. The aim of the primary research is to explore if ICTs can be deployed to enable the improvement of rural human capital and increase participation in market opportunities.

Amidst growing literature on the supply side debates on ICTs in the rural sector, this study addresses the sparsely explored demand side factors. Further, the outcomes of the fieldwork challenge and validate the 'ICT – Rural Poverty linkages' conceptual framework for ICT growth to be good for poverty, developed by the author in an earlier publication (2006). The paper further identifies issues critical to enhancing the accessibility of ICT services to the poorest rural households.

Key words: ICT, rural poverty, digital –divide, India,

1. Introduction

There is growing consensus in the global community on the positive role of ICTs in the development process. The success story of India's ICT sector is well documented. So why question the impact of the ICT growth in India?

India accounts for over 17 percent of the world population and a third of the world's poor. An overwhelming majority of these live in the rural sector dependent on agriculture as their main livelihood (Datt and Ravallion, 2002; World Bank, 2001). India's progress on poverty reduction will therefore have a significant impact on development at the global level. In recent literature, the views of the proponents of 'growth is sufficient' have been contested and come under intense criticism. The search for pro-poor growth has gained much support and momentum in the current literature (Kakwani and Pernia, 2000, Baulch and McCulloch, 2000, Ravallion, 2004, Paternostro et al, 2007, Manning, 2007). The evidence for the ICT sector - though very rudimentary and in much need of further research, suggests that the ICT growth

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in India may not be pro-poor (Tiwari, 2006). The paper is therefore both timely and critical to exploring whether and how India's ICT growth is impacting the lives of the rural poor. The study is grounded in primary research conducted through field surveys in Dhar district of Madhya Pradesh. Dhar is considered as the pioneer in adopting ICT services for the rural sector in India. In the year 2000 the first ICT driven development project called Gyandoot was implemented here.

It is envisaged that the findings of the study will further the understanding of the much contested benefits – direct and indirect of ICT based projects in the selected rural areas. The key findings are examined within the 'ICT – Rural Poverty linkages' conceptual framework developed by the author (2006). The objectives of the study are: (1) to build and assess the profiles of the beneficiary and the non-beneficiary cohorts of ICT driven rural development projects and (2) to identify causative, impeding and enabling factors in the successful spread of the project. These are examined in detail in the fieldwork analysis and the discussion section that follows.

The paper is organised in six sections. Following a brief introduction in section one, section two provides an overview of the current literature on the role of ICTs in developing countries. The context within which the primary research was undertaken is discussed next. Section three describes the project (Gyandoot) and the socio-economic position of the region. The methodology for the study and the primary data analysis are given in section four. Section five presents a discussion on the wider debate on ICTs and rural poverty reduction based on the findings of the primary research. Conclusions of the study are outlined in section six.

2. Context and the current literature

Amidst growing evidence that ICT can play a constructive role in development (Hanna, 2008; Papaioannou and Dimelis, 2007; World Bank, 2006; Indjikian and Seigel, 2005; Tongia et al., 2005; Hongladarom, 2004; McNamara, 2003; Chapman et al., 2003; Heeks, 2002) this paper explores the impact of ICT growth on rural poverty in India. Given the increasing interest in the ICTs and the centrality of rural poverty reduction in India on the development agenda at the global level, this primary research is timely. The research explores the role of ICTs as enablers of development and ICTs excluding the most disadvantaged in rural India.

The 'digital-divide' underpins much of the ongoing discourse on whether ICT can be harnessed for mitigating poverty in developing countries. The proponents of ICTs (UNCTAD, 2003) consider ICTs as tools that can be used to provide the poor economic opportunities and improvement in human wellbeing. The conceptualisation of poverty in this paper is based on Sen's, (1985) Capability Approach. The 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.

The World Bank (WDR, 2001) identified three critical areas in poverty reduction efforts: opportunity, empowerment and security. Since then vast amounts of resources have been invested (UNCTAD, 2003;1, Hanna, 2008) in ICTs in many developing countries. The growing extensive application of ICTs in poverty reduction strategies in India is encouraging. Though, in terms of both diffusion of technology and the skills/literacy gap India fares worst and most polarised amidst her competitors – Ireland and Israel and economic rival China (World Bank, 2001; UNCTAD, 2003). India is ahead in the ICT ‘diffusion’ indicators when compared with countries of South Asia and Sub-Saharan Africa. However, the possibilities of a worsening digital divide remain high if a large section of the population is unable to participate in the ICT driven services.

The vast emerging global literature on the use of ICTs in the rural sector of developing countries covers a wide range of applications. These studies cover debates ranging from ICT applications in rural manufacturing/enterprise (Virkkala¹, 2007; Duncombe, 2006; Galloway and Mochrie, 2005; Duncombe and Heeks, 2002; Rhodes, 2002), rural connectivity and rural-urban digital divide (Gamage et al., 2007; Ramirez, 2007; Bowonder et al., 2005; Narayanan et al., 2005; Nikam et al., 2004; Hartviksen et al., 2002; Huggins and Izushi, 2002) and rural education (Yu and Wang, 2006; Misra, 2006; Martin et al., 2001) to name a few. There is also growing literature on the use of ICTs in agriculture and health services in the rural sector. The literature highlights the successful ICT engagement through local entrepreneurs in manufacturing, e-commerce and e-education in particular. The not so successful transmission mechanisms are illustrated through linguistic barriers and the financial sustainability of the telecentres (Gamage et al., 2007). In addition, Rhodes (2002) points to the poor skill base, insufficient receptivity and overall weak infrastructure to support ICTs in rural development in many African communities. The overall context though for the ICT driven services in the rural sector remains positive with many countries offering the services in the local dialect thus overcoming the language barrier.

Duncombe (2006) and Tiwari’s (2006) studies are of particular relevance to this paper. Duncombe theorises ICTs and the development discourse within the

¹ This study looks into the rural sector in Finland and therefore does not belong to the ICTs in developing countries category, but provides useful insights into the applications of ICTs.

livelihoods framework using the case study of Botswana. It is suggested in his study that the direct benefits of ICTs for poverty reduction may be just marginal. A livelihoods approach based model is proposed that can be applied to build the social and political assets of the poor and strengthen the mechanisms that favour the poor. Thus expanding the benefits the poor can derive from ICT led services. The present study assesses the benefits of the ICT services to examine the impact on the livelihoods capital and structures of the user population cohort.

A possible conceptual framework for ICT growth to be good for poverty is discussed in Tiwari (2006). Figure 2 (Section 5) shows the conceptual model. The model illustrates the possible transmission mechanisms of ICT benefits – both direct and indirect to the rural sector. The study notes the absence of the necessary condition – the availability of skilled labour in the rural sector in India for the benefits of the direct employment spillovers of ICT growth to be realised. The direct benefits are postulated via deployment of ICTs to enable improvement of rural human capital (illustrated in Figure 2 as direct benefits: A, B, C, D and E) for poverty reduction. The indirect benefits are conceptualised through increased participation of the rural labour in market opportunities² made possible by better literacy and skills through ICTs. Further indirect benefits are theorised through the increased participation of the rural labour in the market, which leads to a higher share of the rural population in the national income (shown in Figure 2 as indirect benefits A, B and C). The argument is grounded in the discourse contesting the view that growth in itself is sufficient for poverty reduction. It is argued (White and Anderson, 2001, Dagdeviren et al., 2001) that the share of the growth the poor draw depends on their initial share in the national income. By enhancing the share of the rural population in the national income through ICT inputs, ICT growth has the potential to disseminate the benefits of national economic growth to a wider population.

The findings of the current work are deployed in Section 5 to both validate and challenge the proposed pathways in the above paper.

Within the context of rural India ICTs are being applied in numerous sectors to overcome the digital divide to reach the poor in mitigating poverty (PREM³, 2002). These include improving service delivery (Gujarat computerized milk collection) access to information and health care (InfoDev sponsored India Health Care Delivery Project in Andhra Pradesh), to empower the poor by increasing their use of

² This is grounded in the debate on the Capability approach to multi-dimensional poverty put forward by Sen (1999;1,8)

³ Poverty Reduction and Economic Management Network (World Bank, 2002)

government services and to provide security through access to microfinance (Swayam Krishi Sangam).

A detailed discussion on the potential role of ICT in India's development with a special focus on the rural sector is given in Singh (2002, 2004, 2006). The study identifies extensive pathways of ICT deployment in the Indian rural sector. It then examines both static and dynamic efficiency gains as well as the envisaged reductions in the economic inequality and the social benefits that would follow. Singh (2006) defines static gains as those accruing one-time through efficient use of scarce resources. These include increases in operating efficiency as well as reduction in transaction costs. The transaction costs here are interpreted as costs of opportunism and rent seeking. He notes that opportunism is a consequence of information asymmetries as pointed by Williamson (1981). ICTs by correcting the information asymmetry can remove opportunism and rent seeking, thus bring down the overall transaction costs. Dynamic gains are considered to be those arising from higher growth thus improving the overall consumption both in the present and in the future. According to Singh (2006) ICTs can stimulate innovation, which is an important factor for economic growth within the endogenous growth models.

The ICT projects analysed in Singh's study are based on primary investigation of numerous⁴ rural-IT initiatives in India. Both demand and supply side factors of rural ICT uses are considered. Though, the demand side arguments are grounded in the conceptualisation of the potential benefits if the ICT implementations are successful. The supply side analyses are based on the primary work. A useful insight into the applications of ICTs captures the potential benefits in education, health, market efficiency, employment, rural development, governance reform and entrepreneurship using both the demand and supply side constructs.

The fieldwork by Kumar (2004) and Meera, et al. (2004) examines the performance of ICT projects in agriculture. Kumar's (2004) work is based on evaluation of the financial sustainability of India's largest rural ICT initiative the eChoupals. The eChoupals are distinct in their focus on the agricultural sector through providing the necessary crop and market related information to the farmers. The study concludes that eChoupals can be useful and financially viable providing these are viewed as tools to enable the exchange of information. Meera et al. (2004) have examined three rural projects aimed at improving the information delivery systems in agriculture (Gyandoot, Warana and iKisaan). Meera et al. (2004) found that majority of the primary users were literate, male, young farmers though the

⁴ The following specific IT initiatives are examined in Singh's (2006) study – Drishtee, Aksh, n-Logue, ITC (e-choupals), TARAhaat and Akshaya.

effective reach of a government project in marginal areas to the illiterate and poor is noted. The study concludes that the investigated projects were overall beneficial to the farmers. However, an area where much work remains to be done is the gender participation in rural ICT projects. The study observed poor engagement of women farmers in all three projects.

More recent case study based literature on ICT applications presents an overall encouraging picture. Bowonder and Boddu (2005) examine the role of public-private partnerships to reduce the digital divide in rural Tamil Nadu. The study reports a healthy uptake of services in the community covering the poor, middle and rich households. While some very positive evidence of the benefits being availed is provided, the overall study is based on the functioning of the providers. Bowonder et al (2005), attribute the success of ICTs in the traditional leather industry to: the re-engineering of the design, manufacturing and marketing processes using ICTs, and to the systematic training of the local craftsman to adopt the technology. This highlights the centrality of the appropriate receptivity and skill of the users for ICT led initiatives to be successful. The finding resonates with Rhodes' (2002) earlier study of African communities.

The current literature grounded in both primary and conceptual investigations on ICTs in rural India appears to be expanding at a much higher rate into the supply side factors than into the understanding of the demand side. This study addresses the gap by situating the primary research to capture the perceptions and the understanding of the ICT benefits to the users in the rural areas. The objective as noted earlier is to study the impact of ICT driven projects on rural poverty. The investigation seeks to explore if ICTs can be deployed to enable the improvement of rural human capital and increase participation in market opportunities? Further, what is the evidence at the grassroots level for ICTs as enabler of development as well as enhancer of capacity building at the individual, community and societal levels? The paper presents findings of the fieldwork conducted in the Dhar district of Madhya Pradesh.

3. The project

Since January 2000, a government owned computer network – Gyandoot has been launched in Madhya Pradesh. The objective is to improve the accessibility and use of government services by the rural poor. A brief description of the area - Dhar district, where the research was conducted along with some of its special socio-economic characteristics is given below. The objectives and the delivery

mechanisms of the project – Gyandoot are then described in detail. This is followed by a detailed discussion and analyses of the findings of the primary research.

Dhar is one of the 52 administrative divisions of the state of Madhya Pradesh in India. The state is among the four Indian states⁵ with high poverty levels and low human development indicators. Unlike most northern states, the population density of Madhya Pradesh is low at 183 persons per square kilometre as compared with the national average of 324 persons per square kilometre (Census of India, 2001). Since the mid 1990s there has been a positive turn around such that the state is well on its way to improving all poverty indicators. While there was progress in literacy, overall growth and poverty reduction both at the national and the state levels between 1991 and 2001, the strides made in Madhya Pradesh are notable. Amongst the four most backward states, it has the highest literacy of 64.1 percent with the national average at 65 percent while Rajasthan has 61 percent, Uttar Pradesh 57.4 percent and Bihar 47.5 percent (Gol, 2001). Further, Madhya Pradesh was one of the seven states in the country that experienced growth rates of over 5 percent⁶ during the 1990s. In addition, the state expenditure in social sectors has much improved, accounting for almost 40 percent of the total state expenditure in 2000. The health indicators though continue to be one of the worst in the country and remain a cause for concern. There is increasing awareness of the challenges facing the government in the delivery of an effective health service. In recent years there has been a concerted effort to expand the provision of public health services and improve their access in rural and urban areas.

The district of Dhar is primarily an agricultural district with 62 percent of its land under cultivation and over 83 percent of its population residing in the rural sector. It has a rich history making tourism a strong industry. The district accounts for 3 percent of the state population of 60.3 million. The literacy at 52.7 percent – 48 percent rural and 75 percent urban is below the state average of 64.1 percent.

Gyandoot was launched in the state on January 1, 2000, as the pioneering experiment taking ICTs into the rural sector in the country. The government-sponsored initiative was set up to use innovative e-governance, e-commerce and e-education to enable the development programmes. The specific project objectives were: to improve public access to government services, to improve the government functioning by introducing higher levels of accountability and transparency, to bridge

⁵Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh.

⁶ Gujarat 9.6%, Maharashtra 8.0%, West Bengal 6.9 %, Tamil Nadu 6.2 %, Rajasthan 5.9% and Kerala 5.8% (Gol, 2001)

the digital divide, to facilitate citizen-government partnership in social projects and to enhance livelihood opportunities.

An intranet kiosk network is the main delivery mechanism for the various services provided to meet the Gyandoot objectives. The information kiosks (Soochanalaya) were initially set up in twenty-one village centres of the district at a cost of Rs 60,000 per kiosk. Each information kiosk covers 20-30 villages and in all population of between 20,000-30,000 persons, thus potentially accessing a large user/beneficiary base. The kiosks are run by an operator – the ‘Soochak’, who is generally a local graduate (minimum education qualification is 10th standard) selected by the Gyandoot committee. The selected operator is then trained by the Gyandoot engineers. The operator remains a private entrepreneur and at no stage he/she is either an employee of Gyandoot or enters into a revenue-sharing arrangement with the Government.

A participatory process involving the community, government officials and the Gyandoot team was deployed to select the services offered by Gyandoot. Most services carry a fixed charge – originally set at Rs 10 which at the time of the fieldwork was Rs 15 per service. The key facilities offered by the kiosks include: on-line registration of applications for land record, caste, income and domicile certificates, on-line public grievance redress, information regarding government programmes, e-mail facility on social issues and transparency in government. The specific services provided by Gyandoot kiosks are summarised in Table 1 below.

Table 1: Gyandoot services

E-commerce
Prices for agricultural produce
Online village market
Hindi-e-mail, Yellow pages
Online vermi-compost booking
Online matrimonial
Certificates
E-education
Sawaliram se puchiye (Ask a question)
Question bank, quizzes
Computer courses
E-agriculture
Information on good cultivation practices
Information on vermi-compost and practices on organic farming
Information on quality of seeds, rates of certified seeds
Advice on problems related to all agricultural practices
Other services
Bus and railway timetables
Telephone directory – nos. of important persons in the district
Information on availability and rates of ambulance service

Source: Gyandoot, 2007

The focus of the primary work as noted earlier was to assess the extent to which the above services are being used and benefiting the rural population. The fieldwork was based on interviewing a user and a non-user cohort of the rural population residing in the catchment areas of the Gyandoot kiosks.

4. Fieldwork analysis

The fieldwork for this study took place within an overall progressive context with regards to the development initiatives being undertaken by the state government. Hundred households comprising users and non-users of the Gyandoot services from three economic groupings were interviewed. Effort was made to select households from three economic categories – those below the poverty line, marginal and ‘comfortable’ – non-poor households. A comprehensive primary data set comprising two distinct categories, both in terms of methods deployed and content was obtained from each subject that was interviewed. The first category comprised quantitative information on the household members’ literacy levels, livelihoods, ownership of economic assets and other demographic indices. The second set contained information on the usage of Gyandoot services and interviewee views on Gyabdoot services. Semi-structured, open-ended questions focusing on the subject’s understanding of poverty and its causes were used to obtain primary qualitative data in the second category.

The fieldwork focuses on the: (a) socio-economic status of the beneficiaries and the non-beneficiaries – to find whether the poorest are able to access the benefits, which groups are least able to participate as well as which groups are able to avail the maximum benefits (b) the nature of benefits being availed – to study whether these are capacity building – through education, health services, skill enhancement; expanding market opportunities – through enabling access to buyers’ and sellers’ markets, market information, agriculture related information, or improving the knowledge and information base of the participants.

The purpose is to explore whether and how the Gyandoot Initiative is meeting the set objectives and most importantly who the beneficiaries are. It is expected that the outcome of this primary research will be threefold. First, further the understanding of the distribution of the benefits of ICT driven projects in the rural sector. Second, assist in exploring the linkages between such projects and rural multidimensional poverty. Third, provide evidence-based research outcomes for policy and governance framework that work and those that don’t.

Samples of 100 households to include both the beneficiary and the non-beneficiary cohort were surveyed in the selected project area. This was carried out through detailed semi-structured interviews.

The spread of users and non-users in the surveyed sample was around 40 percent and sixty percent (44 users and 58 non-users). The data for the first category gives the user and non-user profiles in terms of income, education and occupation. In the income category BPL indicates those below poverty line and APL represents those above poverty line. The poverty line here is the national poverty line of Rs 365 per month (Rs 12 per day) which approximates the World Bank's dollar a day (PPP, 1993 prices) poverty measure. Those below poverty line are given a red book by the state government.

Table 2: User and Non-user Population Profile

Distribution by poverty line	User (%) n=44	Non-user(%) n= 66
BPL	20	34
APL	80	66
Distribution by education		
Illiterate	16	26
Primary	31	32
Middle	16	19
Secondary	20	12
Pre-university	7	5
Graduate	9	2
Technical	2	4
Distribution by Occupation		
Landless	12	21
Marginal farmer/tenant	2	7
Medium farmer	35	43
Large farmer	49	26
Other	2	3

Source: Author's fieldwork data, 2007

The profiles of the two groups shown in Table 2 indicate the user group to have a higher proportion of those above the poverty line (80%) as compared with the non-user group (66%). The educational levels for the user group show only 16% of users to be illiterate as compared with 26% of non-users. Almost half of the users (49%) are large farmers while the landless and the medium farmers make up almost two thirds of the non-users. Overall, the surveyed sample indicates that those with higher levels of literacy and income are accessing the Gyandoot services more than those with lower literacy and incomes. The connections between the indicators – literacy/educational level income and occupation were inconclusive. A number of those above the poverty line and in the large farmer category were also in the illiterate category or with very little formal education. At the same time, a number of interviewees who had up to secondary level education were landless working as

casual labour. This conforms to the wider discourse on factor market imperfections⁷ and presence of distortions in the rural labour markets in developing countries (Bhagawati, 1971; Tiwari, 2001; Krishna et al. 2002; Dhar, 2007). Two other trends emerged regarding the education levels of the interviewees' household. First, almost all female adults from user and non-user households were illiterate or at best educated up to class 3. Second, on a more encouraging note all children (male and female) were enrolled in primary or secondary school. Of the total sample surveyed, none were female users though two of the fifteen functional kiosks were run by female operators.

The outcomes noted above are further analysed within the context of the wider discussion on ICTs and rural poverty reduction in section 5.

4.1 Gyandoot services' awareness, usage and user's views

The awareness and usage of Gyandoot services in the surveyed population of Dhar is indicated in Figure 1. The main source of information regarding the Gyandoot Services is the Kiosk Operator. After an initial information campaign in 2000, the State machinery has completely delegated the service delivery of the kiosks to the independent kiosk operators – the 'Soochaks'. There are regular meetings between the 'Soochaks' and the director of Gyandoot to discuss the infrastructural weaknesses and other obstacles in the delivery of the services. Gyandoot continues to facilitate the technical improvements needed in the kiosks. The information dissemination and the delivery of the services though are solely the remit of the 'Soochaks'. Some Soochaks used the village meeting platforms to inform the people through verbal communication and used posters in shops and schools. These entrepreneurs were upbeat about their kiosks and wanted to expand the services. The others were not as forthright in advertising and were surviving by using the kiosk as telephone booth and photocopying service.

The services shown in Figure 2 are based on Table 1 and represented by G1 to G16. G1 is the information on agricultural markets and commodities, G2 is caste certificate, G3 is income certificate, G 4 is domicile certificate, G5 is landlords' passbook of land rights and loans, G6 is land record (Khasra Nakal), G7 is Hindi email, G8 is E-education, G9 is advisory module, G10 is rural news, G11 is rural market information, G12 is matrimonial service, G13 is employment news, G14 is BPL family list, G15 is exam results via internet and G16 is information on other government schemes. A number of services such as - advice on problems related to

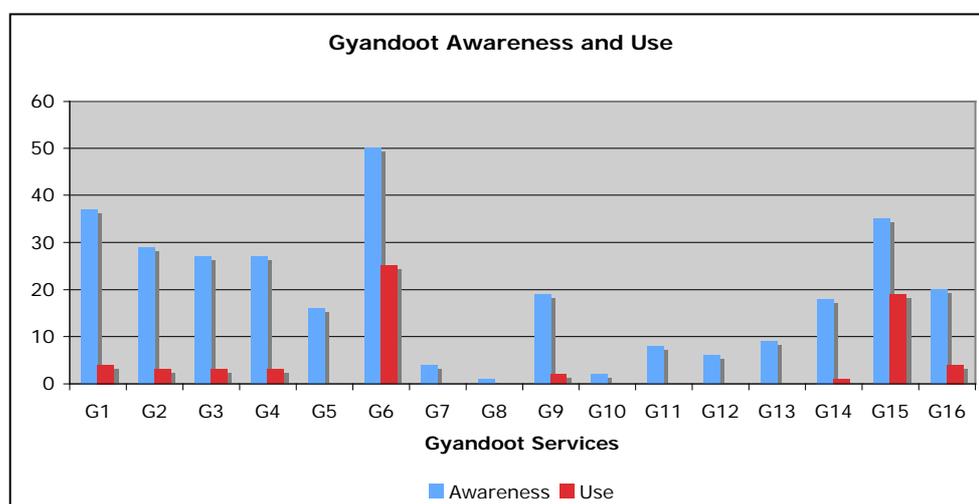
⁷ Here educated labour as the factor of production is being paid much less than its competitive market value – hence the presence of factor market imperfection.

all agricultural practices and advice on health issues did not take off at all. The kiosk operators reported that the users were not happy to substitute a 'machine' for a human being, preferring the face to face consultation and advice.

The sixteen services noted at the kiosks can be categorised into - Information and service enhancing: market opportunities, government schemes for development, agriculture related input and advise, matrimonial, Hindi-email and internet use, Entitlement enabling: land record certificates, caste certificates, domicile certificates, BPL list, exam results and Skill enhancing: computer courses.

The usage trend of the services is far grim than the awareness level of Gyandoot. Just 1-2 of the sixteen noted services are being used. The most used service was G 6: providing certificates for the land records (Khasra Nakal). The users found the maximum benefits through savings in time and money. The kiosks are able to provide the documentation for a minimal fixed fee. This not only saves time, effort and costs in commuting to the nearest government office but also avoids the practice of bribing the officials. The difference in the amount paid to the district officer varied from Rs 100 to Rs 500 per record as compared with the fixed amount of Rs 15 paid to the Gyandoot kiosk. This is of particular help to those below poverty line and marginal households earning minimum wages of approximately Rs 60 per day.

Figure 1: Awareness and Usage levels of Gyandoot Services



Source: Based on the author's fieldwork data

The usage pattern clearly indicates uptake of entitlement enabling services – in particular physical entitlement. The land records certificates are used to confirm the land ownership status. The entitlement is then used to avail a range of benefits and subsidised services. These include banking and financial assistance at concessional rates, subsidised agricultural and infrastructure inputs as well as numerous social

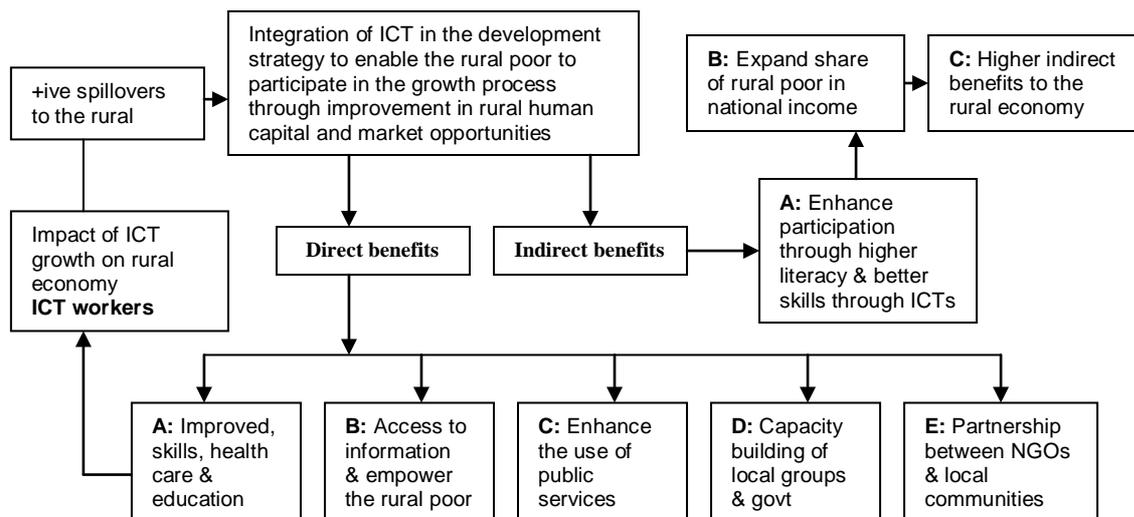
welfare measures. The human capital and skill enhancing services listed in Gyandoot as e-education, healthcare and advice/information related modules were found to have negligible uptake. Information services related to market opportunities after an initial healthy usage level appeared to be much on the decline through a possible crowding out effect of the mobile technology. The farmers are able to get current market rates even if just one person from the village or a relative from another village visits the market. The information is communicated and shared in real time over the mobile phones, which have a high penetration in the region. The market information through the Kiosks on the other hand is not always current depending on when it is updated. The more efficient technology is therefore providing the demand for the market information thus diminishing the use of the Kiosks for this service.

The key findings from the users' views of the Gyandoot services are: poor information of Gyandoot services, lack of understanding and awareness of how some of the services can be helpful and low publicity of Gyandoot in the rural population. These reinforce Rhodes' (2002) observation of weak receptivity of the communities for ICT enabled projects and Bowonder and Bodu's (2005) emphasis on skills required to engage with such projects. On numerous occasions the survey team found themselves as ambassadors and propagators of the Gyandoot Project. In most instances the information was received well with most people agreeing that many of the services would be very useful to them.

5. ICTs in the rural sector and poverty reduction

As noted earlier in section 2, the key findings of this fieldwork are examined within the 'ICT – Rural Poverty linkages' conceptual framework illustrated in Figure 2 below. The direct benefits of ICTs in the rural sector as also discussed in Section 2 are illustrated in Figure 2 as direct benefits: A, B, C, D and E. The indirect benefits are shown in Figure 2 as indirect benefits A, B and C. In addition, by improving the skill base of rural labour through higher literacy and better healthcare (direct benefit A), ICTs can stimulate the economy to generate employment opportunities. Also, by helping to increase participation and empowerment of excluded groups (direct benefit B) it has the potential to reduce income inequality. Further more, its most unique feature is its ability to narrow the digital divide that is inherent in its interface with the rural population with low literacy and skills. The conceptual benefits of ICT to poverty reduction and inclusive development though are linked to a variety of other factors. These include: the integration of ICTs in the development policy to achieve the identified target and harnessing the role of ICTs as enabler of development as well as enhancer of capacity building at the individual, community and societal levels.

Figure 2: Conceptual framework showing possible ICT – Rural Poverty linkages



Source: Based on Tiwari (2006).

Findings of the current study based in Dhar district of Madhya Pradesh substantiate the presence of the digital divide in the rural areas surveyed. Mechanisms to bridge the digital divide via education and healthcare portals of Gyandoot have been incorporated in the project and form strong pro-poor basis of the supply side factors of the ICTs. The demand side factors reveal a different story. The uptake of the digital divide bridging services of Gyandoot was found to be sparse to negligible. The main cause for this service failure is attributed to incomplete and absent market information. Some of the interviewees when informed of the different services by the research team indicated the possible uses in their lives. This illustrates the information asymmetry to be the main cause of the low uptake. The finding contests the assumption that ICT can itself reduce the digital divide and enable market participation of the rural population. While the potential for the ICTs to bridge the digital divide and improve the rural human capital remains undisputed, it is unlikely that the outcome can be realised without the appropriate stimulation of the demand side factors.

The direct benefits (A, B, C, D and E) in Figure 2 are far from being realised in the Gyandoot project area. The only service with a healthy uptake is that of land records – an entitlement (physical) enabling service. Two possible explanations emerge as to why this is so. First, the essential nature of the requirements of land records for securing the entitlement and second the immediacy of the benefits that maybe availed. These are both in terms of time/monetary costs as well as the government subsidies/benefit packages. There is clearly a gap in the perception of the communities as to how Gyandoot services may connect with the wider entitlements of being educated, skilled, healthy and their overall wellbeing. Unless

these information asymmetries are addressed the demand for such services is likely to remain weak.

The potential of the ICTs to reduce income inequality by increasing participation and empowerment of excluded groups indicated in the conceptual model (Figure 2) is also subjected to scrutiny through the field data. The theoretical perspective and rationale of the ICTs to enable the participation of the excluded groups remains strong. The user profile data in Table 2 in section 4 though unfolds a somewhat contrasting picture. The surveyed sample as noted in section 4 indicates that those with higher levels of income, literacy and land ownership are accessing the Gyandoot services more than those with lower literacy, incomes and land ownership. Further, there were no female users of Gyandoot services. This is partially explained through the sociological configuration of the rural communities in the region. First, as seen earlier all the females were at most educated up to class three – hence with very low literacy levels. Second and more importantly, the women in the marginal and poor households while worked alongside the male members of the house in the fields, going to the kiosks to get certificates etc. would be strictly outside their remit. The communities have a very deep understanding and clear categorisation of what jobs are done by whom. In addition, the distances of the kiosks from the villages could deter female participation. Though this aspect was neither explored nor did it surface in any of the interviews. Health related education would certainly be beneficial to the females in the rural community. The delivery mechanism and the content may need to be modified to emphasise the educational content for hygiene and prevention rather than medical advice to replace a doctor.

In its current format of delivery, Gynadoot services are unable to effectively engage the economically and socially disadvantaged groups as well as the female members. Again, despite a strong supply side market presence underpinned by a robust rationale for inclusive development, the outcome is far from being achieved.

Some noteworthy achievements of the Gyandoot initiative deserve mentioning. First, the model itself is a unique experiment of engagement with local community through a private locally selected individual to deliver the services. This not only encourages entrepreneurship in the rural sector but also provides the much needed stimulant in the employment market for the rural educated labour, albeit by a small factor. Second, the near elimination of hardships for the rural poor in terms of the costs – monetary and time as well as the bribes to the officials for obtaining the land record certificates was immensely appreciated by the users. Further, a large number of interviewees attributed illiteracy as the cause of poverty. Therefore the education services too could be provided to address the illiteracy concern of the population.

The project needs a well-researched strategy to realise its potential and achieve the outcomes to become an enabler of inclusive development in the rural sector.

6. Conclusion

Conceptually, the potential of the Gyandoot model to enable poverty reduction through education, health, expansion of market opportunities and information is strong. The outcomes though are far from being realised. Based on the information gathered through the field survey and the users' views, there is evidence of market imperfections through sluggish demand side factors and information asymmetries. This appears to be the main cause impeding the uptake of the majority of services being offered by Gyandoot as discussed in section 4. Overall there is a strong supply side market presence of the Gyandoot services but weak demand mostly rooted in poor information. While the possibilities for the ICTs to bridge the digital divide and improve the rural human capital remains undisputed, it is unlikely that the outcome can be realised without the appropriate stimulation of the demand side factors in the rural sector.

Areas where there has been notable success through the Gyandoot initiative are in providing invaluable physical entitlement enabling services and introducing a unique public – private partnership encouraging entrepreneurship in the local economy. The latter bears the potential to act as a stimulant to the rural labour market for the skilled labour. Both outcomes strengthen the livelihood structures and reinforce Duncombe's (2006) postulates.

The linkages with other Gyandoot services of education, health together with community engagement and the wider debate on entitlements and capabilities remain weak. Given the poor health indicators in the region, health education specifically to the rural females should be given attention to encourage the uptake of the services. Partnership with midwives and female community health workers to deliver the health related services could attract the female users to the kiosks. The information asymmetries that exist across all services can be addressed with a comprehensive campaign of door- to -door dissemination repeated at regular intervals. The survey team found people to be most receptive when talking to small groups and families rather than to large number of people in village meetings. The household level publicity has the added advantage of involving the women directly.

Overall, the uptake of the Gyandoot services is not at the optimum level. Given the sparse usage and information as indicated in the fieldwork, any assessment of the impact of the Gyandoot initiative will capture an incomplete data set. Before any meaningful impact and benefit assessment of the project can be carried out, it is

essential to address the information asymmetries through better publicity and participatory workshops at regular intervals.

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References:

- Baulch, R. and McCulloch, N. (2000). Tracking pro-poor growth. *ID21 insights No. 31*. Sussex: Institute of Development Studies
- Bhagawati, J. (1971). The generalized theory of distortions and welfare, in *Trade Balance of Payments and Growth: Essays in International Economics in Honour of Charles P. Kindleberger*, Bhagawati, J. et al, North Holland Publishing, Amsterdam
- Bowonder, B. and Boddu, G. (2005). Internet kiosks for rural communities: using ICT platforms for reducing digital divide, *International Journal of Services Technology and Management*, 6(3-4), pp. 356-378
- Bowonder, B., Sadhulla, S and Jain, A. (2005). Evolving an ICT platform for a traditional industry: transforming artisans into entrepreneurs, *International Journal of Services Technology and Management*, 6(3-4), pp. 379-401
- Chapman, R., Slaymaker, T. and Young, T. (2003). Livelihoods Approaches to Information and Communication in Support of Rural Poverty Elimination and Food Security. ODI-DFID-FAO.
- Datt G. and Ravallion, M. (2002). Is India's economic growth leaving the poor behind? Mimeograph, World Bank: Washington, DC.
- Dagdeviren, H., Hoeven, R Van der and Weeks J. (2001). Redistribution Matters: Growth for Poverty Reduction. International Labour Organisation (ILO) *Working Paper*. Geneva: ILO,
- Dhar, B. (2007). Agricultural Trade Protection: A Perspective from India, ARTNet Policy Brief No. 11, January 2007, www.artnetontrade.org
- Duncombe, R. (2006), Using the Livelihoods Framework to Analyze ICT Applications for Poverty Reduction through Microenterprise, *Information Technologies and International Development*, 3(3), pp. 81-100
- Duncombe, R.A., and Heeks, R.B. (2002). Enterprise across the Digital Divide: Information Systems and Rural Micro-enterprise in Botswana, *Journal of International Development*, 14(1), pp. 61-74

Galloway, L. and Mochrie, R. (2005), The use of ICT in rural firms: a policy-oriented literature review, *The Journal of policy, regulation and strategy for telecommunications*, 7(3), pp. 33-46

Gamage, P. and Halpin E.F, (2007), E-Sri Lanka: bridging the digital divide, *The Electronic Library*, 25(6), pp. 693-710

Government of India, (2001). Central Statistical Organisation, New Delhi.

Hanna, N.K. (2008). *Transforming Government and Empowering Communities*, World Bank, Washington D.C.

Hartviksen, G. Akselsen, s. and Eidsvik, A.K. (2002), MICTS: Municipal ICT Schools – A Means for Bridging the Digital Divide Between Rural and Urban Communities, *Education and Information Technologies*, 7 (2), pp. 93-109.

Heeks, R. (2002). "i-development not e-development: special issue on ICTs and development." *Journal of International Development*, 14, pp.1-11.

Hongladarom, S. (2004). Making information transparent as a means to close the global digital divide. *Minds and Machines*, 14, pp.85-99.

Huggins, R. and Izushi, H. (2002), The Digital Divide and ICT Learning in Rural Communities Examples of Good Practice Service Delivery, *Local Economy*, 17(2), pp. 111-122

Indjikian, R. and Siegel, D.S. (2005). The Impact of Investment in IT on Economic Performance: Implications for Developing Countries, *World Development*, 33(5), pp. 681-700

Kakwani, N. and Pernia, E. (2000). What is Pro-Poor Growth? *Asian Development Review*. 18(1), pp.1-16

Krishna, K., Mukhopadhyaya, A. and Yavas, C. (2002). Trade with Labour Market Distortions and Heterogeneous Labour: Why Trade can Hurt, NBER Working paper No. 9086

Kumar, R. (2004). eChoupals: A Study on the Financial Sustainability of Village Internet centers in Rural Madhya Pradesh. *Information Technologies and International Development*, 1(3), pp. 45-73.

Manning, R. (2007), Pro-poor Growth: Negotiating consensus on a contentious issue *Development*, 50(2), pp. 42-47

Martin, L.M., Halstead, A. and Taylor J. (2001), Learning in rural communities: fear of information communications technology leading to lifelong learning?, *Research in Post –Compulsory Education*, 6(3), pp. 261-276

McNamara, K.S. (2003), Information and communication Technologies, Poverty and Development: Learning from Experience, Background paper for the InfoDev Annual Symposium, December 9-10, Geneva, Switzerland.

Meera Shaik. N., Jhamtani A., and Rao, D.U.M., (2004), *Network Paper No.135*, ODI, London.

Misra, P.K. (2006), E-strategies to support rural education in India, *Educational Media International*, 43(2), pp. 273-283

Narayanan, A., Jain, A. and Bowonder, B. (2005), Providing rural connectivity infrastructure: ICT diffusion through private sector participation, *International Journal of Services Technology and Management*, 6(3-4), pp. 416-436

Nikam, K., Ganesh, A.C. and Tamizhchelvan, M. (2004), The Changing face of India: bridging the digital divide, *Library Review*, 53(4), pp. 213-219

Papaioannou, S. and Dimelis, S. (2007). Information Technology as a Factor of Economic Development: Evidence from Developed and Developing Countries, *Economics of Innovation and New Technology*, 16(3), pp. 179-194

Paternostro, S; Rajaram, A; Tiongson, E. R. (2007), How Does the Composition of Public Spending Matter? *Oxford Development Studies*, 35(1), pp. 47-82

Ramirez, R. (2007), Appreciating the Contribution of Broadband ICT with Rural and Remote Communities: Stepping Stones Toward an Alternative Paradigm, *The Information Society*, 23(2) pp. 85-94

Ravallion, M. (2004). Pro-Poor Growth: A Primer. *World Bank Policy Research Working Paper Series No. 3242*. World Bank, Washington DC.

Rhodes, J. (2002), The development of an Integrated E-Commerce Marketing Framework to Enhance Trading Activities for Rural African Communities, *Perspective on Global Development and Technology*, 1(3-4), pp. 269-293

Sen A. (1985). Well-being, agency and freedom: the Dewey lectures. *Journal of Philosophy*. 82(4), pp. 169-221.

Sen, A. (1999). *Development as Freedom*. New York: Knopf.

Singh, N. (2002). Information Technology as an Engine of Broad –Based Growth in India, pp. 24-57, in *The Information Economy in India*, ed. Banerjee, P. and Ritcher, F.J., Palgrave Macmillan, London,

Singh, N. (2004). Information Technology and Rural Development in India, pp. 221-246, in *Integrating the Rural Poor into Markets*, ed. Debroy, B. and Khan A.U., Academic Foundation, New Delhi.

Singh, N. (2006). ICTs and Rural Development in India, University of California, Santa Cruz, USA

Tiwari M., (2001). Rural Poverty and the Role of Nonfarm Sector in Economic Development: The Indian Experience, *Ph.D. thesis*, University of Southampton.

- Tiwari, M. (2006). An overview of growth in the ICT sector in India: can this growth be pro-poor? *World Review of Science Technology and Sustainable Development*, 3(4), pp. 298-315
- Tongia, R., Subrahmanian, E. and Arunachalam, V.S. (2005), Information and Communication Technologies for Sustainable Development: defining a Global Research Agenda, Allied Publishers, Bangalore
- UNCTAD (2003). *E-Commerce and Development Report*. United Nations, New York and Geneva.
- Virkkala, S. (2007), Innovation and Networking in Peripheral Areas – a Case Study of Emergence and Change in Rural Manufacturing, *European Planning Studies*, 15(4), pp. 511-529
- WDR (2001). *World Development Report, Attacking Poverty*, World Bank, Washington DC.
- White, H. and Anderson, E. (2001). Growth versus distribution: Does the pattern of growth matter? *Development Policy Review*. 19(3): 267-289.
- Williamson, O.E. (1981). The Economics of Organization: The Transaction Cost Approach, *American Journal of Sociology*, 87(3), pp. 548-577
- World Bank (2001). *Country Assistance Strategy, India*. World Bank, Washington D.C.
- World Bank, (2006). Information and Communications for Development 2006, World Bank, Washington D.C.
- Yu, S. Q. and Wang, M.J. (2006), Modern distance education project for the rural schools of China: recent development and problems, *Journal of Computer Assisted Learning*, 22(4), pp. 273-283