Exploring the ICT and Rural Poverty Reduction Link: Community Telecenters and Rural Livelihoods in Wu'an, China

Cheryll Ruth Soriano

Introduction

This paper explores the link between ICTs and rural poverty reduction by analyzing the role of community telecenters in enhancing the rural poor's livelihoods. Telecenters are major catalysts for information and knowledge that can create development opportunities and choices for rural communities. These development opportunities and choices can, under certain conditions, help improve the living conditions of the rural poor through better and more sustainable livelihood strategies (UN 2004 2-3).

Making telecenters available in rural communities, however, does not guarantee that poor people will and can use them to create and share knowledge that could help lift them out of poverty. While telecenters are considered as "a powerful engine of rural development and a preferred instrument in the fight against poverty," others take a more critical view, arguing that money is better spent on traditional forms of development assistance. Furthermore, whereas some telecenter models (i.e. the Grameen project in Bangladesh) have been considered a best practice by empowering poor communities through new technologies, the failure and massive underuse of some telecenters set up in developing countries have raised doubts over their relevance for poverty reduction and sustainability. As telecenter investments represent opportunity costs and are not used for other development or poverty reduction areas such as roads or food security, it is imperative to determine whether these have benefit at all to the rural poor, and in what ways, so that future investments may be more appropriately programmed.

China is an interesting case for research on the potential of ICTs for rural poverty reduction because more than half of China's population is concentrated in the rural areas and the number of rural poor comprises about 10% of the world's total (1.1 billion people not meeting the $1 a day poverty line). Nonetheless, China has unprecedented achievements in reducing rural poverty over the recent years and it has an emerging ICT sector and a government committed to harness the potentials of ICTs to achieve development goals. Acknowledging the catalytic role of ICT in rural development, China is to invest US$1.4B to alleviate poverty through ICTs[i], expecting these to be the new driving force in the allocation of agricultural resources, upgrading traditional agriculture and improving productivity [ii]. The Chinese government has embarked on the establishment of community telecenters to provide information access for poorer rural areas, one of the projects of which is the subject of this article.

Rural Livelihoods: Framework of Analysis and Research Objectives

The 'Rural Livelihoods' thesis argues that the reduction of poverty hinges on the capability of the poor to combine different livelihood strategies and sources, which allow them to become less vulnerable to shocks and risks. As diversity is related to flexibility, resilience and stability, diverse livelihood systems are seen to be less vulnerable than undiversed ones (Ellis 2000, 1999 8-9). This implies that relevant to improving livelihoods are interventions that facilitate diverse household strategies and opportunities. A key concern is directed at which institutional arrangements, policies, and interventions help the rural poor to achieve more secure livelihoods, while others fail[iii].

Chapman, et. al. (2004) emphasized the importance of ICTs both in generating information required by the rural poor to make decisions on livelihood strategies and generating information required by institutions responsible for making decisions about policies and processes that affect those strategies[iv]. They emphasized that effective information systems need to integrate the productivity-based needs of rural communities with information.

The deployment of telecenters in rural villages brings about new technologies for accessing information and services relevant for households to either intensify agricultural production, assist the adoption of diversified livelihoods, facilitate migration, or to enable the combination of all these. This access to information and knowledge can also lead to the creation of capabilities to gain more livelihood resources/assets and help reduce the poor's vulnerabilities. Using the rural livelihoods framework, this paper investigates the role of community telecenters in enhancing access to livelihood resources and capital assets that could, under certain conditions, improve their livelihoods. These livelihood assets include *natural capital*, which covers land, water, and biological resources utilized by people to generate means of survival, *social capital* or the social resources upon which people draw in pursuit of livelihoods, such as networks, membership in groups, relationships of trust, access to wider institutions of society; *human capital*, or the skills, knowledge, ability to labor and good health important to the ability to pursue different livelihood strategies; *physical capital* or basic infrastructures such as transport, shelter, water, energy and communications and the production equipment and means, which enable people to pursue their livelihoods; and *financial capital*, or the resources which are available to people and which provide them with different livelihood options (Ellis 2000:31-37).

Findings: The Case Studies

The "Information Access Center Project"(*Xin Xi Fu Pin Wang Zhan)* implemented by the UNDP and Ministry of Science and Technology (CRTDC-MOST) in five pilot counties in China were selected as focus as these sites aim to demonstrate how to "use technology for reducing rural poverty." Two villages in Wu'an which were part of the project were chosen as case studies: Pushang (mid income), and Menwangzhuang (low-income).

A combination of research methodologies were used (desk research, field interviews, surveys and focused group discussions). A participatory survey and focus group discussions were conducted in each of the two villages in February and April, 2006. Interviews with the project leaders from the Project Center in Beijing – UNDP and MOST, the county level in Wu'an, Hebei, and the village levels were conducted. Telephone interviews were made in May-June 2006 to clarify data gathered and verify research findings. Published and unpublished mid and post project evaluations were utilized. Data obtained from a survey/interview initially conducted by the researcher with assistance from students of Peking University in February 2006 involving 30 households each in Pushang, Shangdian, and Menwangzhuang villages was also referred to[v].

Wu'an, Hebei Telecenter Network

Despite being considered as one of the top 10 cities of Hebei province after enjoying economic growth during the reforms of the 1980s, Wu'an still has 9 poor townships, 210 poor villages, and about 45,000 poor households. Most of Wu'an's poor live in the mountainous Western area of Hebei, which covers 36% of the total land area and where 46.8% of the population reside (Yang 2004: 38). Representing the unbalanced development in China, the average annual income of village households along the Eastern region is more than four times (4,000 yuan) the income of those in the mountainous villages (less than 1,000 yuan) in 2004. Plagued by undeveloped transportation, significant distance from the city center, insufficient mineral and natural resources, and poor human resource capabilities and basic services, Wu'an's poor mainly depend on basic agricultural activities and livestock-raising.

Profiles and Livelihoods of Case Study Villages

Pushang, located in the South of Wu'an, has 335 households and a population of 1,165. The village, with a farming area of 2,652 mu[vi], primarily produces flour, corn, millet, mushroom, and feeds, and has recently engaged in the production of Chinese medicine, organic vegetables and trees. In 2001, the village's average annual income is 800, and the village accountant noted that this has increased to 2,900 RMB (US$375) in 2005. More than 80% of the households have television (about 10% of them have more than one), 50% have fixed telephone and mobile phones, and about 6 households now have their own computers with Internet access. More than half of the households have members who work in other villages or cities as migrant workers. Pushang has one elementary school with three computers, three health centers, and all households have electricity and water.

The second village, *Menwangzhuang* is a mountainous village lying in Huoshui townwhich has 180 households (580 villagers), all of whom have electricity and water sources. About 70% have television and radios. The village's main livelihoods are chestnut and walnut farming (85% of households). Some households also plant green vegetables, persimmon trees, potatoes and corn, and raise pigs and chickens for subsistence. More than 60% of households have at least one member of the family working in the cities or other villages as migrant workers, while about 30 young people

are looking for jobs outside the village (unemployed) but help their households in farming activities. Menwangzhuang's household average annual income in 2005 is 900 yuan or US$116 (declared is US$181) [vii]. The village, and its neighboring village, Shangdian, was plagued by heavy floods in the past before the water irrigation project was built. The village used to have a primary school of its own but now shares this school with other villages. There are 8 computers in the school and 2 computers in the telecenter and they all have access to the Internet. Two health centers have been set up in the village. There is one stage and 2 playgrounds, which also serve as community common space for gatherings and special occasions. The villagers used to rely heavily on radios but they mentioned they do not use them as often now that the television is available.

Like Pushang, Menwangzhuang households perceive that their lack of information on agricultural strategies/training and knowledge of possible livelihood activities are their top major livelihood constraints. Faced by considerable distance from the city, lack of transportation facilities, and inability to produce in large quantities, Menwangzhuang villagers find it imperative to rely on local brokers (middlemen) to sell their produce, thereby bringing down the selling price. The farmers perceive that after summing up transportation and marketing costs, including labor, there would not be much difference in earnings if they sold their produce to larger markets on their own. Some Pushang farmers, on the other hand, are able to produce more and market their produce on their own. Unlike Menwangzhuang, Pushang is not in a mountainous area and has greater access to markets. A few small and medium enterprises have also been built in Pushang which have hired local villagers as workers (i.e. hog raising, mushroom and vegetable plantations).

Operation and Deployment Mechanisms

Content and Communications Media.

The telecenters carry web-sourced information made available through various media. No specific content was developed but the project website has links to other websites which carry rich content on agricultural techniques, pest management, possible agribusiness activities and market price information. The project has a pyramid-shaped support structure consisting of the MoST in Beijing and County (www.wakj.com.cn), Township, and Village level telecenters that are all linked through the Internet and Project website, www.cstap.org.cn. Linked to each county are two township Internet centers and connected to each township are two village telecenters, equipped with two (2) computers with Internet capability, 1 fax, 1 telephone, 1 television, a VCR and various printed materials. The village telecenters are also network-linked with those established in other UNDP-MoST telecenter counties/villages, facilitating the exchange of experiences, information, and advertisement of community produce.

Telecenter Operations and Management

The telecenter's operation hours vary depending on farming season but the telecenter is usually open Monday to Saturday from 8am-6pm. The use of the facilities is for free. At the start of project implementation, the village telecenters were poorly managed as the telecenter staff members were hired only on a part time basis. By 2002, each telecenter hired three staff comprising of two fulltime staff and one village leader who serves as part time staff. Wu'an has a weekly journal, which is submitted to the UNDP and MoST offices in Beijing. UNDP/MOST also monitors the development and operations of the telecenters via the Project website and BBS system. Every 10th of the month, the telecenter staff and village leaders meet in Wu'an to report the past month's operations and to arrange the following month's training. Problems encountered in telecenters operations are also raised. *(Zhang, 2006).*

Training and Capacity-Building

During the period of 2001-2004, training of village and township telecenter staff are conducted every month in Wu'an and occasionally at the MoST office in Beijing (twice a year). Training modules include Web/Internet Search, Data Management, Telecenter Operation and limited agricultural techniques. Telecenter staff also post questions on telecenter operations through the BBS system, which links all MoST-UNDP telecenters. Village training is adjusted according to farming schedules. Agricultural training is also provided by Hebei Agricultural University via the Experts Online, which allows agricultural experts in Hebei to provide lectures using the telecenter network. As most farmers, especially those in Menwangzhuang and Pushang are unable to use computers on their own, the telecenter staff help the farmers/children to seek information needed. When villagers discover new agricultural information that require further interpretation, the staff send a request to the county telecenter via the BBS system for Online Expert Advise. According to many farmers interviewed in Pushang and Menwangzhuang, the telecenter staff are instrumental in finding the information that they need.

Telecenter Promotion

Initially, the staff trained a few villagers who are eager and have the potential to learn. Other villagers were encouraged only upon realizing how information accessed benefits the early adopters. Megaphones were also used to attract the farmers into visiting the Centers and to inform them of the telecenter's services. Each telecenter staff is required to network with at least 15 village households whom they shall encourage to visit the Centers every month. Most farmers interviewed informed that they learned about the telecenters and information available through word of mouth. In Menwangzhuang, the villagers mentioned that some farmers ask the primary school students to look for the information they need for them.

Analysis: Project Importance and Role in Enhancing Livelihoods

Perception on Telecenter's Importance Vis a Vis other Rural Poverty Reduction Projects

The participants in the FGDs in the two villages noted that 100% of the households are aware of the existence of the telecenters and recognized the same as an important rural development project. In Menwangzhuang, however, when asked to identify major poverty reduction projects and events over the past 10 years, the villagers failed to mention the telecenter project. This shows that while the villagers appreciate the telecenter's benefits, they would not consider the same as comparable to road construction, telephone installation, building of a dam, leveling off of arable land, or planting of chestnut/walnut trees in terms of importance.

Telecenter Usage and Information Needs

In Menwangzhuang and Pushang, FGD participants mentioned that close to 100% of households have had at least one household member who has visited the Center and searched for needed information (with/without assistance from staff). They reasoned lack of time and confidence/skills in using the computers as factors hindering farmers from going to the Centers. Farmer's wives as well as the youth, teachers and children are frequent users, especially in Menwangzhuang where the telecenter is set-up in the primary school. During telecenter operations within the years 2001 to 2004, the telecenter staff mentioned that an average of 15-20 (Menwangzhuang) and 25-30 (Pushang) villagers visit the telecenter daily. Some villagers mentioned the need to increase the number of computers in the Center as some have to go on line at night to use the computers. However, during the field visits in February and April 2006, very few people (about 4-7) were seen to visit the Center in the day. Further, in several instances in the months of May and June, no one was available to answer telephone calls in the telecenters of Menwangzhuang and Pushang, indicating the irregularity of telecenter operations after the official project duration has ended in 2004.

For both Menwangzhuang and Pushang, more than half of households surveyed mentioned price information as the "most relevant information" accessed from the telecenters, followed by information on proper farming techniques and use of pesticides/fertilizers. They also cited that information on available jobs outside the village and on government's major social security and health programs are critical to them, although they noted that these were not widely available in the telecenter. The information surfed by the farmers based on surf log include recent news, practical agricultural technology and pest management, supply and demand information for various agricultural produce, production and marketing techniques, market and price information, health advise, and household management. The staff noted that the youth also search for employment opportunities online. A few use the telecenter for communication (i.e. E-mail).

Information Sources/Media in Selected Villages

The telecenter was neither the only information source nor the sole technology available in the villages, but it complements the villages' existing information and communication media. According to the villagers of Menwangzhuang and Pushang, the mobile

telephone serves as a convenient tool for tracing relatives and friends' (migrant workers) whereabouts, obtaining news, and relaying information on possible jobs. It also allows communication at an "affordable cost"[viii], with each long distance call costing 2 mao (1/10 RMB yuan) per minute. The households of Menwangzhuang and Pushang still rely heavily on family, friends and village leaders as the most important daily information source/media and the mobile telephone serves as a convenient and widely used medium which helps reinforce these traditional modes of information exchange.

Content, Communications Media

Menwangzhuang farmers benefited from billboards set up in the community common space, carrying information downloaded from the Internet on proper procedures for the growing of chestnuts, walnuts, and green vegetables and other livelihood options/advice. The billboards were set up in the community common space where gatherings are held almost every weekend and therefore can be easily seen by the villagers, whether or not they visit the telecenters. Despite the benefits of information accessed over the Internet, the research findings highlight the need for telecenter staff to be able to generate useful information from the Internet and translate this to appropriate media formats that would least alienate the poor and uneducated. Further, given that more households have access to mobile phones, more services/ applications may be developed for such. For example, the farmers mentioned that it would be good to have market price information available in their mobile phones.

Furthermore, a limitation in the computers set up in the telecenters (as with the usual computers available) is that they can only be used by those who can read and write pinyin and Chinese characters, making most rural farmers unable to use them on their own. In these cases, help from children or telecenter staff is sought to find the needed information. In some agri-information centers set up by the Ministry of Agriculture, touch screen computers or simputers have been deployed in the centers. These make searching for information possible without typing Chinese characters or pinyin input. Although recently produced simputers may be cheap, the poor villagers are unlikely to be persuaded to spend an additional 200 dollars or so, no matter how many impressive functions it boasts of, as they already have the telecenters to sustain. Given this inherent limitation of computers to reach illiterate villagers, the role of telecenter staff in bridging information with the farmers becomes more critical.

Telecenter's Role in Supporting Rural Livelihoods

The discussion below focuses on the perception of Menwangzhuang and Pushang households on the role of telecenters in helping increase their livelihood assets and in influencing them to adopt additional forms of livelihoods:

Human Capital

For the poorer farmers of Menwanzhuang, the telecenter project did not help them market their own produce, as they continued to rely on middlemen due to the inability to produce in large quantities, lack of transportation facilities, and high cost of marketing the goods on their own. Nonetheless, market price information gathered from the Internet gave the farmers some capacity to negotiate with the middlemen, which also slightly increased the farmers'income. Moreover, information increased the peasants' familiarity with the conditions of demand and supply so that they can adjust their products according to which is more in demand, and can sell at higher price. According to Yan Jinru (2006), a villager from Menwanzhuang:

> We used to grow walnut trees that are very hard to maintain and produce sold at low price. At the Center, we found out about a certain variety of walnuts that is easier to crack, and therefore more marketable. We started to grow this kind of walnut after learning about the info and gained more income (20RMB/jin/0.5kg), compared to the old variety which sold at only (6-7RMB/jin/0.5 kg). If we package the walnuts nicely and sell it to the market, it can even be sold at 40/jin.

Information generated from the telecenter has also helped some farmer households in trying out new livelihoods and adopting these in combination with existing livelihoods. In Pushang and Menwangzhuang, the farmers mentioned learning about raising livestock and poultry, growing bees and pigeons, planting green vegetables, or buying and selling "antiques" to complement their traditional livelihood strategies which originally focused on chestnut and walnut farming. New livelihood strategies learned were practiced during off-farm periods or by other household members during farming periods.

Also, information generated from the Internet has helped intensify their agricultural livelihoods by finding better varieties of chestnuts and walnuts to plant, discovering other products to grow, and learning how to better process and market their produce to increase profits. For example, after seeing Pushang's millet produce in the project website, a person from An'yang, Henan Province (within the telecenter network) helped Pushang villagers in the proper way of cleaning and processing millets. Li Zuoshang, a village leader in Pushang, mentioned that this helped them in producing more millets which they were able to sell at higher prices.

Another important contribution of the telecenter is the promotion of e-literacy. The telecenter staff gained additional skills and tools that they were able to share with co-villagers or leverage on to find better earning technology jobs. The first telecenter staff in Menwangzhuang has been hired by the CNC after serving in the project for 3 years. Likewise, the center helped the users, especially teachers, children and the youth (who would otherwise have been deprived of this resource) to overcome the fear of technology and computers and benefit from basic computer training, word processing and Internet search.

Financial Capital

The villagers of Menwangzhuang declared an increase in average annual income from about 400 yuan in the year 2000 (before project implementation) to 900 yuan in the year 2005. Pushang villagers likewise declared an income increase from 800 yuan in the year 2000 to 2900 yuan in 2005. The villagers shared many stories attributing this income increase with the telecenter. In many instances, these stories are also accompanied with estimated figures in income gains that are no longer emphasized in this study due to difficulty in validation and complexity in proving causality given available resources. For example, the telecenter has helped farmers find buyers of rare varieties of eggplants (*"ziguang"*) from other provinces, aided in the discovery of new variety of walnuts that are easier to grow and crack and therefore sell at a higher price, and helped them learn of the uses and cooking methods of rare plant and vegetable varieties found in the mountains that they were later on able to consume and sell.

> I sell wild vegetables in the supermarket in Handan. At the start, few people in the city knew how to cook wild vegetables. I checked the center for ways on how to cook the wild vegetable and possible health benefits. We introduced this information to the buyers in the city and told our village that they can also look for this vegetable to cook and sell. This vegetable has just been here in the mountains but before, we were afraid of eating it because it might be poisonous". From August 2005 until February 2006, we earned about 7,000-8,000 RMB for selling these vegetables, so I am very happy. (Sun Jiqin, Menwangzhuang, February 2006.)

In Pushang, information on market demand and price differences across seasons also helped them learn when to best sell their produce and when to buy agricultural input at better prices. Moreover, information on livestock/poultry raising, disease prevention methods, and on effective fodder ingredients from the Internet helped increase production output and reduce production risks.

Natural Capital

Natural capital assets are not static and may be enhanced or augmented when brought under human control that increases its productivity (Ellis 2000: 32). The telecenter's website promoted the Forest Zoology Landscape District of Wudang Mountain, which has attracted four companies to develop local tourism in Wu'an. Some villagers mentioned finding ways from the Internet for better developing ecotourism in the "Longevity Village" in Huoshui town, including how to market and package their produce to tourists for better profit, but argued the lack of financial capital to do so. As in the previous example, the Internet helped discover the use and cooking methods of a certain plant variety growing in the mountains that were of no use to them in the past due to fear of being poisonous. Now these vegetables are used for household consumption and are sold in markets in the city for additional income.

Physical Capital

The telecenter facilitated the transfer of information between rural centers/cities and the rural mountainous villages. It widened farmers' options for information sources and channels and complemented traditional forms of communication and information media. In Pushang, the telecenter has helped reduce the cost and time of finding a buyer by posting the products available online thereby creating additional markets. Further, the telecenter has helped in reducing the cost of providing training for the county government through the Expert Online Service, which enables the reach of more communities simultaneously and at lower costs, and overcoming geographic hindrances.

Social Capital

As a catalyst in the process of community development, the telecenter in Menwangzhuang and Pushang served as an additional common space for the community's youth and women, especially during the peak of telecenter operations (2002-2004). Although Internet content may not have much information on available jobs in other villages, the youth gathering in the telecenter exchanged information on available employment opportunities and procedures in finding jobs in nearby villages, as well as as on community/county's major events. In Menwangzhuang, the telecenter has become an extension of the primary school classroom where students gather in the afternoon to work on school assignments. It also facilitated information exchange across villages in Hebei and with other pilot telecenter sites in Shaanxi, Henan, Anhui, and Chongqing.

Conclusion and Some Policy Implications

Telecenters carry a huge potential for reducing poverty through its catalytic role in enhancing rural livelihoods. In Wu'an, the rural poor perceived that the telecenter had a role to play in increasing their livelihood assets (i.e. human, financial, physical, social and natural capitals) and make them informed of some production risks, calamities, and disasters (and how to avoid them) which help in addressing the poor's vulnerabilities. Information from the telecenters helped intensify agricultural livelihoods, aided in determining what new/other livelihoods they can pursue during off farm periods, and motivated them to combine different livelihood strategies to gain better income.

The role played by the telecenter in supporting the livelihoods and livelihood assets of the rural communities in the villages vary (see Fig 2). While the telecenter helped some villagers of Pushang (middle poor) in finding buyers for their produce, the same is not the case in Menwangzhuang, whose production is relatively less, and whose products are more difficult to sell. The study shows that in a poorer village, marketing the produce online has no meaning and use for the farmers, but the telecenter played a role in helping them find other forms of livelihood that can augment their existing livelihoods. Farmers in Menwangzhuang generally sell their produce through middlemen. As local brokers greatly influenced the selling of produce in Menwangzhuang, market price information

gave them some negotiating capability with the middlemen, who used to dictate the prices that they simply accepted.

The lack of information makes farmers vulnerable to exploitation by others and makes them unable to realize the full potential value of their produce (i.e. selling produce immediately after harvest at low prices and buying inputs at high prices). Where rural farmers have more access to up to date information, they can communicate better, enabling them to organize themselves, exchange information, and develop strategies to achieve better and more stable prices.

This study validates Duncombe's (2006) study that ICTs can have both a functional and analytical role in poverty reduction. The functional role of ICTs cover the previous discussion on directly enhancing the poor's livelihood resources. Its analytical role, on the other hand, enabled the development workers (UNDP, MoST-CRTDC, local governments, and partner institutions) to maximize time, effort, and resources to bring information, training and advice to rural villages that have enjoyed limited livelihood information and training assistance in the past. In the course of implementation, the project has helped these institutions to better understand the village's information needs, capabilities, and potentials and learned how to deploy future telecenter initiatives to better benefit the poor. This information is crucial in sharing with other institutions the planning and implementing of future poverty reduction interventions.

ICT investments in rural areas are often least prioritized because of inherent difficulty in deployment, perceived high investment costs, indirect developmental impact, and need for an extended period of time to reap actual benefits. However, the importance of information and communication investments is that once information is accessed, absorbed, and translated into knowledge, this knowledge can be stored, further developed, passed on, and even multiply. Notwithstanding doubts on the sustainability of telecenters and livelihoods improvement training facilities, livelihood information gained by the poor villagers after years of implementation is continually being applied, exchanged, and developed in relation to particular needs and contexts. Although the villagers no longer visit the centers as often as during the peak of project implementation, the billboards and printed materials on Internet-generated livelihood information that have been posted in common spaces and disseminated to them still remain. The computer training and educational assistance afforded to the staff and villagers, including the children, are also a crucial intangible investment that prepares them for further education and technology adoption in the future.

However, the extent to which the potential of telecenters for rural poverty reduction could be realized is influenced, catalyzed or inhibited by the following:

The need to target poor villages and households more effectively

While ICTs may have potential to improve the lives of the poor, how the decision makers determine who will use them and how they are used and deployed, contributes greatly in creating conditions favorable for ICTs to reach its potentials (i.e. some telecenters were

deployed in a non-poor village such as Er'jie). As telecenters represent opportunity costs, there is a need to level off understanding of project planners and local implementers of ICT for poverty reduction objectives and strategies so that targeting the poor may be done more effectively and limited ICT for poverty reduction resources are not diverted to rich areas under the mistaken assumption of assured project success. In a larger picture, this requires a major institutional reform involving national and local governments and civil society, and a wider effort to generate national political will to use ICTs as tools to reduce poverty.

Translating information into knowledge and action

Access to telecenter facilities and usage are not equivalent to adoption of better livelihoods. Likewise, community empowerment is not likely to result out of the mere deployment of telecenters. Underpinning the provision of access to information is the support mechanism that could motivate the villagers, help overcome the fear of technology and diversifying into other livelihoods, and take action on the new livelihood information/options available and later sustain and defend these new livelihoods. These support mechanisms include pro-active telecenter managers and staff, community leaders and early adopters who will help search for relevant materials online and make this information available into easily accessible media. Examples of these have been emphasized in early discussions. Another critical support mechanism for livelihood diversification is financial capital. Even if the information is there, the lack of extra capital has hindered many farmer households to adopt new livelihood strategies or intensify agricultural production. Further, they noted that there are limited small loan facilities that can be tapped for venturing into agribusiness entrepreneurship. A farmer in Menwangzhuang mentioned that although information on poultry and livestock had been shared through telecenter training, they do not have funds to invest in these. In contrast, Du Xiyan of Pushang village mentioned that the villagers benefited from marketing online after the village leadership's efforts to designate a pilot farmland where a special variety of tomatoes can be grown, facilitating significant and high quality production. Finally, for those who were able to diversify and adopt other livelihood options, continuous training is critical so that they can make their new livelihoods sustainable (i.e. market research, etc.). Sadly, this training facility is no longer available after the project ended in 2004.

Despite knowledge of new livelihood strategies, the telecenter staff and community leaders play a critical role in facilitating access to information, encouraging the translation of information to knowledge, and enjoining the villagers to take action. This points out to the value of telecenter planning and the relevance of training of telecenter managers and staff. The role of the telecenter manager is critical in telecenter planning and objective setting, development and deployment of technology and services, and in ensuring that the community puts the information and services transmitted from telecenters into productive use. Equally important is addressing the issue of telecenter sustainability, and the telecenter manager is responsible for crafting practicable business models to sustain telecenter operations.

The need to enhance the capacity of telecenter managers and staff in the various aspects of telecenter planning and operations is emphasized. If they obtain sufficient and appropriate training, they can mobilize early adopters, opinion leaders and encourage them to accept the vision of the telecenter project. Telecenter managers and staff must be able to demonstrate the relevance and application of seemingly abstract technology concepts to community realities. They should monitor the needs of the community, understand the demographics of the area, lead the development of content relevant to community needs and capacities, systematically monitor ongoing operations, implement a marketing strategy, establish strong partnerships with stakeholders, and help check systematically on outcomes and consequences.

The need to address issues on rural telecenter sustainability

The training provided to the telecenter staff and villagers have helped not only in searching needed information and putting such information into productive use, but in sustaining interest in a technological project that is initially alienating to the poor. However, interest of the villagers to visit the telecenter has now been dwindling as telecenter operations and training sessions become less regular and much more limited (i.e. after the UNDP/MoST Project has officially been completed). Moreover, as the villages now shoulder the cost of telecenter maintenance and telecenter usage remains free of charge, the cost and benefit of the telecenter to the village is now more judiciously weighed by the village leadership. It is also a concern on sustainability after telecenter facilities have reached optimum use and could no longer be repaired. Given plans to implement larger telecenter projects in poor areas of China, the research emphasizes the need to strengthen efforts to develop sustainable telecenter business models within the Chinese context.

Importance of simple but appropriate technologies and relevance of needs/poverty assessments

The study has shown that the poor households benefited most from simple and cheaper technologies carrying useful livelihood information that locals can relate to and use with less difficulty (i.e. billboards set up in community common spaces carrying livelihood information downloaded from the Internet). This process of combining new and traditional information media helped motivate farmers (uneasy to use the computers) to adopt and use new information and knowledge. In contrast, fax and email were rarely used and facilitating e-commerce (selling produce online), a common objective of telecenter deployment, remains a vision in a rural poor context. At the same time, the mobile phones have penetrated the rural villages and are being considered by them as the "cheapest and easiest form of communication". Thus, more services and content may be developed using the mobile phone that will allow the villagers to improve their livelihood strategies. These findings emphasize the importance of conducting poverty and needs analysis of targeted villages and in designing relevant technologies prior to investment of ICT resources to ensure optimum utilization and maximum benefit from technology resources.

Deployment of ICTs within a poverty reduction strategy and a package of developmental interventions

ICT interventions, if targeting poverty reduction, would work best if they are integrated within a wider poverty reduction agenda. Telecenters, for [ix]example, will be of most benefit if it comes with access to other livelihood resources and assets such as financial credit, education, and capacity building, electrification, roads and other basic services that can improve their living standards, sustain their escape from poverty, and make them eventually self dependent.

---

[i] UN-ESCAP, Financing ICT for Development, (2004: 15).

[ii] By Gao Zuoyu, Official of the Ministry of Agriculture, P.R. of China. http://www.china.org.cn/english/null/105543.htm.

[iii] A detailed discussion of the framework is also provided in Frank Ellis (2000). "Rural Livelihoods and Diversity in Developing Countries" and in "Sustainable Rural Livelihoods: A Framework for Analysis", in Scoones, 1998, IDS Working Paper 72.

[iv] The DFID has also developed a set of matrices to identify linkages more easily between the Livelihoods Framework and ICT4D interventions. See the *DFID Sustainable Livelihoods Guidance Sheets at* www.livelihoods.org.uk

[v] A survey was initially conducted to obtain the household's socio-economic profiles, livelihoods, and villagers' perception on the telecenter's role in enhancing their livelihoods. However, after an initial survey, it was deemed that this methodology alone poses limitations as results did not reflect the community's livelihood strategies and provided only limited understanding of issues hindering the full adoption of technology/information and optimal benefit from telecenter interventions. Due to the inherent abstractness of the concept of information to most of the rural poor, vague and non-responses to surveys posed more questions that later also necessitated the conduct of interviews and group discussions for clarification. It was from extended and informal interviews with the telecenter staff and farmers/family members and focused group discussions that more realistic and honest assessments and interesting findings surfaced.

[vi] One mu is 0.67 hectare.

[vii] They noted that their declared average annual income is much higher at 1,400 (Village Interviews, 2006).

[viii] Their monthly average mobile phone expenses cost 15 yuan (Menwangzhuang) and 25 yuan (Pushang).

References

Chapman Robert., et.al. 2004. *Livelihoods Approaches to Information and Communication in Support of Rural Poverty Elimination and Food Security.* Overseas Development Institute. UK: Department of International Development and Food and Agriculture Organization Available from www.livelihoods.org.

China State Council. 2006. *China's Economic and Social Development Plan (2006-2010).* Available from http://english.people.com.cn/200603/15/eng20060315_250829.html

Duncombe, Richard. 2006. *Analyzing ICT Applications for Poverty Reduction via Micro enterprise Using the Livelihood Framework*. UK: Development Informatics Group.

Ellis, F. 2000. *Rural Livelihoods and Diversity in Developing Countries*. Oxford: Oxford University Press.

Ellis, Frank. 1999. "Rural Livelihood Diversity in Developing Countries: Evidence and Policy Implications". *Natural Resource Perspectives*, No. 40, April, Overseas Development Institute. http://www.odi.org.uk/nrp/40.html

Gerster, Richard and Sonja Zimmermann. 2000. *Information and Communication Technologies for Poverty Reduction?* Discussion Paper. Swiss Agency for Development and Cooperation. Available from http://www.cefe.net/forum/ICTforPovertyReduction.pdf.

Haimin, Wang. Interview by the Author**.** Beijing, China, December, 2005.

Haimin, Wang. 2003. *Analysis of Project Operational Mechanism and Impacts: Poverty Alleviation Project through Access to Information, Communications and Technology in the Rural Area of China***.** Presented during the International Workshop on the Model of Poverty Alleviation through ICTs.

Hebei Statistical Yearbook. 2005. (In Chinese).

Heeks. 2005. *Reframing the Role of Telecenters in Development***.** eDevelopment Briefing No. 2 Development Informatics Group, University of Manchester.

Heeks. 1999. *Information and Communication Technologies, Poverty and Development***.** Manchester: Institute for Development Policy and Management, University of Manchester. http://www.man.ac.uk/idpm_dp.htm#devinf_wp

Jiru Sun and Yan. Interview by the Author (Village Accountant and Secretary). Menwangzhuang, February, April 2006.

Malik, Khalid. 2005. *Speech during the China Forum for Poverty Alleviation and Development.* (UN Coordinator and UNDP Resident Representative in China). Beijing, October 17. Available from http://www.iprcc.org.cn/

Ministry of Information Industry – Department of Planning. 2005. *"The Situation of the Communications Industry in China in 2004*". **China Communications**, February.

Ministry of Science and Technology. 2003. *"Construction of IT Application in Rural Areas"*, **China Science and Technology Development Report**.

PlaNet Finance. 2004. "Overcoming China's Digital Divide: Best Practices and Future Action." White Paper issued by PlaNet Finance China, following the conference *IT @ **Work in China: Bringing the ICT Revolution to Underdeveloped Chinese Markets,*** January, Beijing. http://www.planetfinance.org/ (Accessed: March, 2005)

Proenza, Francisco J. 2002. *E-For All: A Poverty Reduction Strategy for the Information Age***.** FAO.

Qiyun, Bai. Interview by the Author**.** Ministry of Science and Technology, Beijing, China. 13 December 2005.

Roman, Raul and D. Colle. 2001. "Sustaining the Community Telecenter Movement**,"** New York: Cornell University.

Rothenberg-Aalami, Jessica and Jojoyeet Pal. 2005. "Rural Telecenter Impact Assessments and the Political Economy of ICT for Development." Berkeley Roundtable on the International Economy Paper No. 164.

Sangui, Wang. 2004. "Poverty Targeting in China." ADB Institute Discussion Paper No. 4.

State Statistical Bureau – China (various years). n.d. *China Development Report.* Beijing: China Statistical Publishing House.

Ulrich, Paul. 2004. "Poverty Reduction Through Access to Information and Communication Technologies in Rural Areas: An Analysis of the Survey Results from the Social Impact Assessment Conducted by the Chinese MoST and the UNDP: With Recommendations on Issues of Future Sustainability and Household Participation." *The Electronic Journal on Information Systems in Developing Countries*, pp.1-38.

United Nations. 2005. *China in a Globalizing World*. Geneva: United Nations Publication.

United Nations Development Programme. 2005. *Human Development Report 2005: International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World.* United Nations Development Program, Vienna. Available from www.undp.org.

_____ 2004. "Millennium Development Goals. China's Progress." Beijing, China. Available from http://www.undp.org/mdg/China_MDG.pdf.   (Accessed: 10 January 2005)

United Nations - Economic and Social Commission for Asia and the Pacific. 2003. "Report on the Expert Group Meeting on Government Policies and Strategies on Information and Communication Technology for Rural Poverty Reduction in Asia and the Pacific Region*.* Bangkok, 27-28 November 2003." (unpublished). Available from http://www.unescap.org/rural/ictegm2003/report.pdf. (Accessed: 28 December 2004).

_____ 2004. Financing ICT for Development in Asia and the Pacific. November.

Wang-Dexiang, Daniel. Interview by the Author**.** Beijing, China, December 2005.

Wang Wensheng. 2001. *The Impact of Information and Communication Technologies on Farm Households in China*. Germany: Peter Lang Publications.

World Bank. 2001. *China: Overcoming Rural Poverty*. Washington, DC: World Bank.

Yang Xu. 2004. *Searching for a Feasible Model for the Implementation of ENRAP in China. Experiences of Two Projects of Utilizing ICTs for Rural Development: PATI and ENRAP.* Canada: International Development Research Center.

Yonggong Liu. Interview by the Author, Beijing China, December 2005.

Yonggong Liu. 1998. "Institutional and Policy Reform in Rural Extension in China During the Transition Towards a Market Economy." *Training for Agriculture and Development*. Rome: Food and Agriculture Organization.

Zhang Qiwang. Interview by the Author*,* Wu'an Science and Technology Bureau, Hebei, China. February, March, May, June and July 2006 (In Chinese, interpreted by Cai Ying).

Zhe Wang; Jiang Aiqun and Bai Qiyun. 2005. *The Impact Assessment of Poverty Alleviation with Information. Forum on Science and Technology in China*. Ministry of Science and Technology and China Science and Technology Promotion and Development Research Center, 6th issue, pp. 97-101 (In Chinese).

Zhong Yongling. Interview by the Author. Beijing, China, 2006.

Zhong Yongling. 2004. "Information Systems in Rural China: Field Survey and Findings." Michael Riggs, et.al (eds.), FAO.