Reassessing Korean IT Policy to Link Rural Online:
The Missing Gap of Korean Rural E-Readiness

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Enormous efforts to address the rural-urban 'digital divide' has been taken by the Korean government to bring development to rural areas. Despite its extensive achievement its outcomes are insufficient whereby improvements mainly occur in technology diffusion, while rural residents' reluctant attitudes and limited IT use remain unchanged. This paper reassesses the case of Korean rural IT policies using the notion of information capital which requires not only technology but also other non-IT related elements such as people's knowledge, capabilities, and social and economic network to process information use. Korean rural communities' basic education, welfare services, and other political and economic capacities are not well prepared to easily react to online activities. Policy actions must broaden their scope to integrate non-IT related assistance programs, and consider empowering other complementary elements within the broad social capital.

Keywords: rural-urban 'digital divide,' rural development, information capital, Korean rural community, rural IT policy

1. INTRODUCTION

In the knowledge economy of the 21st century, online application and information resource are rapidly becoming one of the primary dimensions of rural development. Even more, as commercial transactions are increasingly carried out online, farmers' online participation in the agriculture sector is imperative. Problems of rural disadvantage are largely attributed to low population density, aging, greater distance to major markets, and disconnect from mainstream social opportunities and services such as education, health, and occupation. Online networks and Internet use are regarded as upholding the promises of offsetting such conditional problems of rurality (Hindman 2000; Parker 2000; Warren 2007). At the same time, however, uptake of new information technology between rural and urban has been uneven, and information development in rural areas is lagging far behind that of urban (Bell et al. 2004). Based on the belief that online application will bring rural development an unequal spread of new information technology is exacerbating the already large inequality, leaving out the rural community from enjoying the benefits of online activities. Driven by the technocratic belief that online application will guarantee rural development, policy initiatives have rushed to address the rural-urban digital divide and rural advancement by promoting technology access to rural regions such as deploying broadband networks and establishing public Internet access centers.

Critiques, at this point, have indicated that rural-urban digital divide approaches have been too simple and technology-centered in which technology access is not enough (Hollifield and Donnermeyer 2003; Maleki 2003; Warren 2007). Instead, a more broad and complex set of solutions are called for taking into account the socio-economic characteristics, offline communication networks, information needs and motivations, social trust, and development of locally owned rural businesses (Cancian 1981; Hollifield and Donnermeyer

2003; Patterson and Kavanaugh 1994; Rogers 1995). Furthermore, addressing problems of rural digital divide appears to be sophisticated and comprehensively embedded within the social marginalization (Warren 2007). One crucial point is further made that new ideas of online rural community prove deficient 'with little involvement of farmers themselves' (Malecki 2003: 201). Despite such recognition of the complex characteristics of the rural-urban digital divide, mainstream policy actions still persist to take the access-based solution to resolve the problem.

Such an optimistic perspective about the role of new ICT for rural development and the importance to address its digital divide has also been prominent in South Korea, (hereafter referred to as Korea). In modern Korean society, rural development has been a persistent challenge particularly after the rapid industrialization and urbanization. In this context, the Korean government has put great effort to deliver online access and Internet use to rural areas and enhance its social and economic competitiveness (Cho 2005). Main policies have been diverse involving broadband deployment, public Internet access centers, recycled PC donation, installing farmers' web pages, and IT education programs. Although policies have brought progress, its outcomes remain limited with the rural still lagging far behind the average population (Alper 2007). If this is so, how relevant have Korean IT policies that link rural online to rural development? What are its achievements? And, what more is there to do? This paper aims to reassess the relevance and appropriateness of Korean rural IT policies to link rural online by treating information as one kind of resource, hence a form of social capital, that requires other resources to complement the process of information use (Lamberton 1999). This perspective enables the policy framework to escape from the technology-based approach and focuses on the rural end-users' information capability and use. Further, the benefits of information use for development can only be assessed based on the experiences of end-users to address the needs important within their circumstances (Menou 1993). As such, this paper suggests that provision of Internet per se will not necessarily bring rural development unless other multivariate resources are concurrently supported to empower the rural community to make use of the technology for their needs. Policy implications are provided to essentially consider possibilities of the lack of social resources, system failure, limited communication network, knowledge capability, and motivation within the rural context.

2. RECONCEPTUALIZING INFORMATION USE AND DEVELOPMENT

In the age of 'information society' led by new digital technologies, the notion of 'capital' needs to be updated to include 'information and knowledge' and 'information networks' as a dimension of a broader concept of capital (Lamberton 1999). In literature, the notion of capital has been a challenging concept, and as a multidimensional one embedded in interpersonal relationships and social network, which provides the means for citizens to cooperate in the community (Bjornskov 2006; Putnam 2001). In short, information is one kind of resource, specifically, an 'enabling resource' that helps people achieve their goals (Arrow 1974). This information, as an intangible resource, has a structure and can be called capital. Schumpter (1953) defines capital as a stock of goods in which 'its various parts complement each other' to form outcomes such as buildings, consumer goods, and equipments. Hereby, some parts of stock must come before others to process the production of capital, and 'various sequences or lags between economic actions impose themselves and

further restrict our choices' (631). According to different types of capital, different compositions of the stock of goods are required which will ultimately share the complementary relationship within the structure. When adopting this framework of structured capital, complementarities of various elements within an information stock is essentially required to process information use. When people intend to use information technology to process information and knowledge, many other resources must be in place before or after technology access. Some people might possess certain parts, while yet other parts need to be acquired. When a new form of information-using capability is developed, its structure becomes more complicated requiring more advanced sets of resources. Hereby, structural complementarities of Internet use are composed of not only information technology access, but also people's understanding, intellectual ability, needs, interests, motivation, and beliefs about the world around them. Each of these resources complements the structure of information capital which will drive the beneficial use of information. A person will encounter difficulty to make use of information technology when any of these required elements are not in place. This is so in the case of rural-urban digital divide. Difficulties that rural residents face in adopting the new technology and sharing information is not entirely determined by technology per se, but rather other missing elements that must complement the technology access such as the lack of education, information culture, needs, interests, and existing social network. Lastly, the whole information using process from motivation, choices, reactions, experiences to beneficial outcomes of information technology can only be determined by rural community themselves according to the ability to apply information use to solve the problems they perceive important for their needs in life.

Emphasis must be given on the end-users' information-using capability to take the advantage of the Internet, and consider their reality and viewpoints when assessing the relevance of Internet use for development. Literature that shares this perspective emphasizes the concept of 'information use environments' (Taylor cited in Menou 1993). According to Lievrouw (2000) the information using environment to a particular community and its information and communication culture of its members is important. Access to information can only be accomplished when members of a community have developed an appropriate level of capacity to make use of that information access (Lievrouw 2000). In this respect, Mansell (2001) advocates the importance of the readily prepared capacity which involves lengthy periods of time to learn and to adjust to the new technology system.

Further, critical research reassesses the role of the Internet on development focusing on the meaning of benefits for the end users and the purpose of information use (McConnell 1995; Menou 1993). Information and benefits can only be evaluated from the users' point of view. Thus, generalizing the meaning of information benefits to all user groups would be neglecting 'the different perceptions of need and benefits held in different societies' (McConnell 1995). In this context, it is imperative to point out that '[n]o specific factor, much less information, can be singled out as a main cause of development' (Menou 1993: 20). Thus, different meanings will be given to different factors depending on the particular context in which case something that seems irrational to an outsider may be perceived as rational to an insider. According to this point of view, people's motivation to accept change, their capability to understand and process information, and the output of information use ultimately is shaped by the user and information usage context. Consequently, beneficial meanings of information use can only be precisely measured when it incorporates the end-users' capabilities, needs, and circumstances.

3. THE ROLE OF NEW ICT AND THE RURAL-URBAN DIGITAL DIVIDE

Optimism about the role of new ICT as a 'rural development tool' has been prevalent among rural development policy makers, assuming that adopting ICT use will create many opportunities and benefits in economic growth, community integration, citizen participation, provision of education and health services, and enhance the quality of life (Kavanaugh and Patterson 2001; Schuler 1994). Commentators are ambitious to anticipate that rural people 'will become avid Internet users if opportunities to do so exist. With experience, such use often will become more sophisticated, essential, and conducive to making a real difference in their lives and, subsequently, in their communities' (Hiemstra 2005). In this term, discussion has been ongoing about the beneficial characteristics of the Internet and measurements to consider in addressing the rural-urban digital divide.

3.1 Benefits of New ICT for Rural Development: the general view

As online system integration is gaining importance in business and industry, ICT has been strongly suggested as a key factor for future economic viability and sustainability in rural areas. Characteristics of online transition through web pages will off set the geographical disadvantage of long distance and dispersed population (Hollifield and Donnermeyer 2003; Maleki 2003; Parker 2000). Due to such reasons 'benefits of online communication in the countryside may be relatively greater than in urban areas' (Warren 2007). The Web can be potentially used for a variety of purposes such as communicating internally/externally and sharing data; searching for information on customer service and vendor support; purchasing and selling products and services and collaborative work; and to effectively advertise rural tourism products (Akca et al. 2007). Such advantages in terms of distance also applies to government services in rural areas where the scope and rate of administrative services can be enlarged.

While online benefits for rural economic advancement has been predominantly recognized, others have importantly recognized the intangible advantages in a broader context directly related to rural people's quality of life (Soete 2000). For example, civic goals can be achieved such as enhancing community integration, empowering citizen participation, extending the provision of education programs, and improving residents' quality of welfare life (Anderson et al. 1995; Schuler 1994). Deploying online government systems will facilitate the delivery of welfare services between central policy initiatives and local communities, and allow the government to monitor the effectiveness of various welfare programs (Mathur and Ambani 2005). In turn, rural residents can participate and voice their opinions directly with policy initiatives. Furthermore, through surfing the web, rural residents can efficiently access health services, or find nurse careers for older farmers, check education programs in distant areas, search for jobs, and communicate long distance with peers.

3.2 Measurements of rural-urban digital divide

Based on the optimistic thinking about IT for rural development, much debate has been raised in terms of measurements that will determine, if not, distract, rural uptake of online activities. In particular, the role of formal structures has been emphasized when dealing with

disadvantaged groups due to their different socioeconomic status. That is, the gap is closely related to rural residents earning less income, higher aging population, and less educated (Cancian 1981). Furthermore, among rural farmers, the higher their income and education attainment is, the more likely a farmer will use the Internet. A more influential perception has been based on technology access assuming that investment in infrastructure development combined with Internet facilities will wire rural communities to online network (Raju 2004). The main cause of rural-urban divide is conceived as poor telephony lines in countryside areas insufficient to deliver digital contents. Most recently, establishment of broadband network has started to play a crucial measure to efficiently deliver wireless Internet service at a low cost (Parker 2000; Song et al. 2006). Consequently, overflowing policy projects have been implemented to invest broadband infrastructure in remote and marginalized geographic areas. Such an approach is based on the assumption that once technology access is obtained Internet uptake will follow.

Challenges, however, have been made to the simplistic 'technology-center dimensions' contesting that rural divide is a more complex problem embedded within the local context (Gurstein 2003; van Dijk and Hacker 2003). Servon (2002) indicates three levels of rural barriers involving access to systems and hardware, IT skills, and online contents suitable for the user group. Some point out the importance of structural variables such as regional, community, and organizational memberships that provide the social context in which individuals adopt technology (Rogers 1995). Hereby, a more significant aspect of rural disadvantage relates to their lack of the ability or knowledge to make efficient use of the technology (Strover 2001). In addition, other factors such as the need of engagement, awareness of technology benefit, and confidence has been further mentioned (Future Foundation 2004; Sanyal 2000). Limited perception of needs and motivations also influences rural residences' reluctance to take up online activities (Sanyal 2000). Considering the nature of online networks connecting users, individual's personal communication networks has been put forward to affect decisions in perceiving the need and adoption of Internet use. Oxendine et al. (2003), further, advocate the importance of trust and community in developing online community networks finding that political participation and interpersonal trust among the rural citizens was crucial in influencing people to go online. Ultimately, matters of rural-urban divide are multidimensional and more likely to be based on the social, cultural and institutional environment.

More critically, rural areas are not disadvantaged in terms of access such as electronic commerce contents and email contents, but rather the divide is a relative concept depending on the rural conditions (Howell 2001). Warren (2007) attributes this to the preexisting social marginalization in rural society (Warren 2007). In this research, an important contribution is made by viewing rural digital divide not as a factor that drives social exclusion viewing rural digital divide not as a factor that drives social exclusion makes an important contribution, but rather, 'social exclusion leads to digital exclusion, which in turn perpetuates and exacerbates that social exclusion' (2007: 379). Hereby, social exclusion is a multidimensional phenomenon involving individual's lack of resources, relational issues and system failure. For Warren (2007: 374), the digital divide is about drawing a 'vicious digital cycle', and because rural communities will have more relative gains from overcoming the distance problem than urban people, the cost of digital exclusion will be greater.

3.3 Approaches to address the rural-urban digital divide

The most substantial effort has been made by government initiatives as well as multilateral institutions, and nonprofit organizations in sponsoring and constructing broadband infrastructure to deliver wireless high-speed Internet services to rural areas. For example, private sector participants have collaborated with government agencies to bring less-expensive high-speed Internet access, building fiber-optic cable, and cellular infrastructure in rural villages (Hiemstra 2005). Furthermore, policy initiatives are finding solutions by sending up satellites to subsidize high-speed digital services and reach remote areas at low cost. Many commentators stress the importance of Universal Service Obligation (USO) to the provision of infrastructure in remote rural areas where there is low population density (Sanyal 2000).

Programs to better design web pages and user-friendly content in order to facilitate motivation factors have been implemented (Warren 2004). For example, in Scotland, Rural Community Gateway (RCG) website and portal was launched to provide rural 'one-stop shop' updating news, information and documents that catered to rural interests, and opening an 'online community' to promote information sharing among farmers and between rural-urban participants (Skerratt and Warren 2007). The main objective is to facilitate networking between different levels of institutional structures.

IT educational programs have been another important scheme to actually empower rural residence to utilize the Internet (Grenfell 2005; Warren 2007). These programs include various teaching programs in local community centers, supporting IT instructors for IT human resource development, dispatching voluntary IT assistants, and opening IT classes in local schools. More recently, e-learning programs have been enthusiastically promoted as a means to overcome long-distances in many marginalized rural areas, and reduce education disadvantage amongst rural youngsters (Warren 2007). For example, governments have promoted IT training programs in local schools or public institutions, dispatching trainees from urban areas to conduct one-to-one assistance with rural residents. Another example is traveling around countryside villages with a minibus converted into a mobile computer classroom as an effective means to deliver IT learning to farmers in remote areas. Encouraging farmers to take up Internet use was supplemented providing physical equipments and public Internet connections. For instance, governments have encouraged businesses to reduce the price of PCs, and encouraging private firms to donate recycled PCs to low-income groups in rural areas.

Building public Internet access centers, often referred to as telecenters or public information kiosks, have been aggressively initiated in order to target multiple users in villages in the most inexpensive and inclusive form (Raju 2004). In general, public access centers or telecenters, provide information and communication services equipped with computers, fax machines, photocopiers, and Internet access. Other than simply providing online and physical access, software programs have been installed. Such programs include installing databases to provide local information such as pricing and job searching, local directories such as bus timetables, email address registrations, and building farmers or village portals for advertising and commercializing farming products. In addition, IT learning classes are actively provided within the center's facilities. Public Internet access centers associated with additional activities serve well to form an online community within rural society.

Despite policy efforts to carry out diverse projects at all levels of Internet adoption, criticism about its inappropriateness and inadequacy have been stated that '[n]o single top-down solution is going to work in all rural locations' (Parker 2000: 284). This critical perspective emphasizes the issue of complexity and relevance of the actual using environment in which technology alone cannot fully satisfy. Correspondingly, alternative solutions require the involvement of local governments, institutions, firms and residents (Parker 2000; Malecki 2003). Although such criticism is valuable in terms of recognizing the need of local participation and matching the local circumstances, it still fails to go beyond technology-based solutions towards a more comprehensive approach involving other socioeconomic resources. Achievements and limitations of such a multilateral approach with emphasis on technology issues will be reassessed through a case of Korea's rural informatization policy.

4. RURAL-URBAN 'DIGITAL DIVIDE' AND POLICY ACTIONS IN KOREA

4.1 Rural disadvantages and information inequality

Korea's rapid industrialization and urbanization has created substantial inequality between the rural and urban regions. Rural economic development has been devalued, business network alienated, democratic participation disenfranchised, and social welfare neglected from the mainstream social transition. Also, its demographic characteristics have been under-stated as extremely aged, low-income, and poorly educated. Such geographic social marginalization has been exacerbated through the nation's remarkable spread of digital online services and use that has been pre-occupied by urban consumers to create another rural-urban 'digital divide.'

Rural population appears to be declining in an unbalanced way in which a number of households have been reduced from 1.5 million (2000) to 1.3 million (2005) accounting for a reduction rate of 5.3 percent. In addition, the rural population is rapidly aging where the dependency ratio of older people aged between 60 and 70 has increased to that of the economic population. Concurrent with the aging rural population, inequality between different rural groups is also noticeable. For instance, the population of older farmers over the age of 60 shares 59 per cent of the total rural workforce while that of young farmers aged 30-40 shares only 18 percent. However, the income level of older farmers only account for 50-73 percent of the average urban income while that of young farmers account for as much as 103-128 per cent of the average urban income level (KNSO 2006). In sum, within the context of the low fertility rate, demography aging, and population declining, the rural community is undergoing income inequality in light of rural development as well as living inequality within rural society.

The social welfare environment and the quality of life in rural communities reveal to be extremely poor (KNSO 2006). Rural education system remains inferior and deficient. For example, only 11 percent of elementary schools and 3.7 per cent of secondary schools are located within a village, and the majority is located more than 5 kilometers outside of the rural towns. Only 33 percent of high schools are located within the distance of 5 km while 64.4 percent are farther than 5 kilometers. Furthermore, other subsidiary private and public academic institutions only totaled 6 percent while the majority was located in rural towns outside the 5 km distance. In terms of medical services, nearly 94 percent of total general

hospitals and 87 percent of medical workforce are located in big cities. In terms of rural situation, only 10 percent of pharmacies and public medical centers are located in villages and 55 percent are outside the 5 km boundary. Overall, the coverage and quality of basic welfare services remain inferior and far behind local needs.

The unequal spread of new ICTs has become another important dimension of rural disadvantages. According to statistics released by Korea's Ministry of Information and Communication, 36 percent of the Seoul population has subscribed to a broadband network service, ranking one of the most connected cities in the world (MIC 2007). However, statistics reveal a completely different pattern when describing ICT diffusion in rural areas. While 86 percent of Seoul residents aged between 30s and 40s are linked online only 10 percent of the cohorts residing in provincial areas are linked, and this low linkage rate falls even more dramatically in the remote countryside (MIC 2007). Korea's average PC ownership rate by households recorded 78.9 percent where as only 43.6 percent of rural population owned a PC (KADO 2006). As for Internet use, compared with the national average 72.8 percent of Internet users, only 23 percent reside in rural areas. In sum, the rural-urban 'digital divide' index stands out to be the highest among other information disadvantaged groups with the score of 50.2 in terms of the gap between nation's average informatization (KADO 2006).

4.2 Korean government policies to link rural online

Tackling the rural-urban digital divide has been highly prioritized within the government's rural development plans. In this respect, multivariate IT programs have been implemented mainly focusing on establishing telecommunication infrastructure, installing rural information network systems, building farmers' web pages for electronic commerce, and supporting rural IT skills and knowledge. Importantly, such programs have been aggressively implemented based on strong cooperation among institutions and agencies from all levels of public and private sectors.

Establishment of telecommunication infrastructure
In order to support computer availability and affordability, 'PC donation for the rural' program was widely carried out by public facilities and individuals. Given the policy target to cover more than 50 percent of rural population with PC ownership by 2005, delivery of low-cost and recycled PCs amounted to 5,000 PCs per annum. The PC delivery process was facilitated through a systematic collaboration between the public and private sectors, and local governments and local-based firms. In particular, local agencies played an important role in managing the distribution channel between PC providers and rural recipients, monitoring the conditions of PCs, and repairing devices. 'PC donation for the rural' scheme endured for three years, from 2002 to 2004, with the total budget of 1.13 billion KRW. The program at a central government level finalized in 2005, and thereafter was continued by local governments and institutions.

Public Internet Access Centers, namely rural 'digital Lounge (*digiteol salangbang*)' were aggressively established, as an effective means to provide high-speed Internet service to multiple users. Public Internet Access Centers, equivalent to telecenters or information kiosks, commonly utilize local centers or schools providing access to Pentium computers, broadband network, and other information peripherals such as printers, scanners along with fax machines and photocopiers. In addition to physical facilities, the Centers served as

computerized information booths, installing village-specific web pages composed of local information, different prices for farm products, communication with external and internal counterparts, and advertising rural industry and tourism. Moreover, IT learning programs were provided inside the 'digital lounge'. Such public access centers available for multiple users can be regarded to be the most inexpensive and inclusive form of rural infrastructure possible. In terms of project administration, both the central and provincial government department are the main sponsoring body, and local institutions provide the monitoring and planning, and local towns and village organizations undertake the establishment.

Rural IT education programs

Enormous emphasis has been given to developing IT skills among rural residents through various measures of IT education programs. Community-based IT trainings have been widely executed mainly in public Internet access centers and local schools, composed of Internet learning curriculums and instructors. In terms of small and remote villages, temporary short-term programs have been conducted as well as moving from village to village using an IT training bus service. Based on the requirements of local participants, visits were made to particular communities with its matching programs. One of the highlights of the Korean rural IT education programs has been the active voluntary program among rural citizens to visit rural towns and assist rural counterparts with using the Internet. On top of that, programs have been designed at multiple levels considering the different level of groups' capabilities and different purposes of learning. The content ranges widely: basic computer use, Internet use and emailing, Web page design, searching information for farming, managing database, and agricultural electronic business and marketing strategy. Recently, online learning programs have been promoted to effectively establish more opportunities for rural learners, particularly in remote areas. In order to encourage online learning, follow-up online programs have been provided as well as installing program information on the web. As such, rural IT education programs have taken an integrated channel of off-line and on-line schemes. This has been expected to bring a synergy effect to motivate rural participants to actively make use of their IT skills.

Rural information networked system

Projects to promote rural information network systems, in order to develop an online community, have been initiated by developing and maintaining a digital database system specializing in farming and fishery industries. Content comprised of specific information on each farming product ranging from price, knowledge, market trends, expertise information, manufacturing techniques, chemical information, and other value-added information. Data were organized and classified to serve as a search engine. Further, the portal provided community-based information such as health information, farming techniques, and welfare information in order to improve the quality of life in rural areas. For example, special medical treatment and guidelines on use of pesticide were offered. The online content is continuously being updated and supplemented with better quality information. In addition, the portal allowed urban communities to access local rural information.

Online search engine programs were further developed to support farmers' business management and marketing strategy. The program was planned, operated and monitored by a pool of experts from diverse research institutions, providing accurate and up-to-date content not only via websites, but also through SMS, wireless Internet, emails, and FAX. For

example, online content provided an auction platform, prices at different levels, market trends and predictions, and weather forecasts.

Supporting farmers' web page management and electronic commerce

Special programs to assist farmers design and manage web pages were carried out to encourage their online participation and electronic commerce. The project set out to build web pages for every farm unit, coordinate the overall web page management and operation, directly operate a central portal site that would coordinate individuals' web pages, and educate farmers' web page management skills. As a result, the number of farmer websites increased from 106 in 1999 to 1,706 in 2004. Rural information projects to assist setting up web pages for every farm unit expired in 2005.

Tentatively having finalized the setup stage of the farmers' web pages in 2005, the project concentrated on the maintenance and efficiency of each web page by providing incentives and competitions among each web unit. Having established a large pool of online farmer sites, the actual use and the quality and sustainability of the websites were important. Well-performing web pages were identified through government sponsored competitions in which awarded web pages received full government support. Further, full market support was given to farm units with high online sales and revenue such as advantages for farm web pages to have connections to major online shopping malls. Such campaign programs brought awareness and motivation to rural residents to take up online marketing. Education programs were further developed considering different levels of website management capabilities and complementing advanced level curriculums.

Direct effort to launch an online shopping mall specifically in the agricultural and fishery sector has also been promoted by the government. The scheme was jointly carried out by the central and local government by establishing a Managerial Committee for Rural Electronic Commerce. This integrative central-local system facilitated active cooperation among local agencies and agricultural bodies. In addition, the Managerial Committee has been concentrating on developing effective market regulation systems. In practice, the project is set to expand and upgrade shopping mall sites, to develop a central search engine database for shopping information, and to develop measures to facilitate consumer relationship management. For instance, supportive instruments such as product certification system, standardization and online shopping malls were developed. Value-added programs such as online business marketing training and consulting services, integrative logistics system development, assisting rural advertisement, and monitoring the quality of products and its transaction were subsidized. Basically, policy effort to promote farmers' online participation was to ensure farmers' market power, extend their market coverage, increase revenue, as well as facilitate consumer relationships through more competitive pricing and convenience.

5. REASSESSING KOREAN RURAL IT POLICIES FOR DEVELOPMENT: WHAT SO FAR? AND, WHAT MORE?

Korea has implemented a wide range of rural IT projects to encourage non-urban regions to take up the online culture, and thus bring about development in a more efficient way. Different projects have been applied for different purposes including the establishment of technology infrastructure, rural IT education programs, a rural information network system, and supporting farmers' web page management and electronic commerce. As a result, the

Table 1. Rural PC ownership and Internet use

		2002	2003	2004	2005	2006
PC ownership	Access rate (%)	29.4	33.2	35.8	43.6	50.2
	Access divide	49.1	44.7	42.0	35.3	29.4
Internet usage	Usage rate (%)	11.9	16.2	16.9	23.0	29.4
	Usage divide	47.5	49.3	53.3	49.8	45.4

Source: KADO 2007

ownership of PCs per household in rural areas increased from 29.4 percent in 2002 to as much as 50.2 percent in 2006 (KADO 2007). Accordingly, the digital divide index referring to the gap between rural segments and the average overall population reduced from 49.1 points in 2002 to 29.4 in 2006 (KADO 2007). Given such improvement in terms of the spread of access, various acknowledgements can be made about the overall Korean rural IT policies.

Firstly, close partnership was built between central and local government institutions to promote the provision of advanced low-cost services to many remote rural communities. This recognizes the importance of cooperation and participation, rather than competition, from all governments, and their efforts to develop broadband infrastructure targeting multiple users' general purpose (Parker 2000). Not only has the central government played a crucial role in partnering with local firms, but it also is very supportive and encouraging towards business partners. For instance, as seen through giving full support for rural web pages that were performing well, competence development programmes also do much to enhance motivation since there is an element of persuasion inherent in any training process, and those who are thus raised to full capability will tend to interest others by word of mouth (Warren 2007).

Secondly, there was an active participation of rural organizations to facilitate the delivery of programs to reach the target groups in a reliable way (Akca et al. 2007). While the policy design and initiatives were authorized at the central government level, rural-based institutions such as schools, NGOs, and government agencies played a substantial role in actually managing, operating, monitoring and maintaining the programs. More importantly, full support was given to empower local firms' active participation in promoting online community and transaction.

Lastly, and most importantly, humanizing the IT programs has been incorporated through the delivery of community Internet access services and IT education programs (Raju 2004). For instance, IT assistants were widely dispatched in community centers in order to operate and monitor the centers and give assistance to rural users. Such face-to-face interaction provided user-friendly IT environment and satisfied the needs of unskilled rural users. Also, web content was specially designed to be easily approached by rural users. In terms of IT training, rural IT volunteer campaigns are to be noted in which many groups of urban volunteers consisting of working professionals and students visited rural villages to assist IT learning. Such a citizen-to-citizen relationship significantly impacted the friendly humanistic environment where rural residents could develop interests and relations to Internet use. As such, the government-led Korean rural informatization policies that incorporated active institutional participation from public and private sector as well as integrating a user-friendly environment promoted the spread of the digital infrastructure and Internet access across rural areas.

Limitations, nevertheless, remain in terms of the realistic outcomes of linking rural online. In short, significant progress occurs in terms of technology diffusion itself rather than the actual use of the Internet by rural communities. Recently the media has been reporting that despite the great investment in the rural community Internet access centers, namely 'digital lounge' or 'IT plaza', many have been found to encounter difficulty operating accompanied by low visitor turnout (MBC 2007). One IT instructor remarks on the difficulties of teaching as 'it is impossible for farmers who are illiterate or have no formal education to learn how to use the Internet' (Kim 2003). Table 2 shows that while the size of the Internet access divide has been significantly reduced, from 49.1 to 29.4 points, the change of Internet usage divide remained extremely limited, from 47.5 to 45.4 points, during the same five year period. When comparing the 'digital divide index' by sector, the divide occurs greatest amongst farmers/fisherman across all categories of the Digital Divide Index. Hereby, it is to note that while the reduction rate of the Access Index (11.6 point) is greatest among all other groups, progress in IT skills (4.1 point), Amount of Use, (6.1 point) and Quality of Use (5.8 point) of farmers/fisherman occur the lowest among all other disadvantaged groups (Table 2). Such limited outcomes of policy actions seem to reaffirm that 'access to new information and communication technologies is not synonymous with [end-users'] adoption' (Hollifield and

Table 2. Scores of Digital Divide Index by Groups

Digital Divide Index (scores per annum)		Disabled	Low income	Farmers/ Fishermen	Older people	Average
General	2004	42.5	44.4	66.2	59.1	55.0
	2005	34.8	35.8	58.3	50.7	46.7
	2006	26.1	27.0	50.2	41.6	38.0
	Yearly reduced rate	8.7↓	8.8↓	8.1↓	9.1↓	8.7↓
Access	2004	27.0	38.9	48.7	33.7	36.3
	2005	22.4	30.2	42.1	26.5	29.0
	2006	14.6	20.4	30.5	17.1	19.8
	Yearly reduced rate	7.8↓	9.8↓	11.6↓	9.4↓	9.2↓
IT skills	2004	58.9	50.1	81.7	82.3	72.5
	2005	50.0	41.7	75.0	76.7	65.8
	2006	39.0	32.9	70.9	67.6	57.1
	Yearly reduced rate	11.0↓	8.8↓	4.1↓	9.1↓	8.7↓
Amount of Use	2004	51.1	46.3	76.5	74.1	65.8
	2005	41.4	38.6	68.0	66.4	57.8
	2006	32.2	30.7	61.9	58.3	49.7
	Yearly reduced rate	9.2↓	7.9↓	6.1↓	8.1↓	8.1↓
Quality of use	2004	54.5	50.7	80.5	79.3	70.4
	2005	46.9	43.0	74.5	70.3	62.3
	2006	38.0	35.1	68.7	60.5	53.6
	Yearly reduced rate	8.9↓	7.9↓	5.8↓	9.8↓	8.7↓

Source: KADO 2007

Donnermeyer 2003). Why is this so? What are the disparities of the current Korean rural IT policy actions that have failed to fully link rural online?

Critically remarking, rural IT policies have been overly optimistic about the role of the new ICT assuming that all rural members will be able to take up the Internet in the same way as urbanite users. Such simplistic 'quick fix' solutions appear to be inappropriate and inaccurate to fully realize the objective of providing benefits of online activities to empower rural communities. At this point, the two main perspectives of information use and development indicated earlier in this paper serve as a useful framework to reassess the realistic outcomes of current rural IT policies. First, re-conceptualizing information as structured capital which requires many different elements to complement each other to process information, policymakers need to recognize other complementary elements such as rural people's educational background, work environment, ways of communicating and sharing information, their interests and motivational elements, and their market situation and needs. Aside from uptake of new ICTs, other living standards in rural communities lag far behind that of urban areas including educational systems, market environment and its competitiveness, economic capacity, and welfare systems (KREI 2008). No matter how well and abundant the provision of technology may be, such overall disparity of social capital will constrain their capabilities to efficiently take up the Internet. Ultimately, the main cause of the rural-urban 'digital divide' is attributed to a broader context of social disadvantages rather than new technology itself. Focus, thus, must go beyond technology disparity alone to identify the overall readiness of rural communities. In consequence, the rural-urban digital divide solutions will include subsidizing other basic resources deficient in rural areas, and hence address the underlying problems of rural social marginalization. Although the speed of technology diffusion may deter such comprehensive and step-by-step approach to well-prepare rural information capability will be more effective in the long term.

Second, the outcomes of rural IT policies must be assessed from the rural communities' perspective considering whether IT use has brought about change that they perceive necessary for local development. Deliberate consideration must be on the realistic needs of rural communities within their present circumstances. According to a survey report on the public perceptions of rural lifestyle and development, many other factors other than IT development occurred deficient and underdeveloped (KREI 2008). For example, rural citizens were more likely to be unsatisfied about rural life, in particular, pointing out the general living environment, education, and welfare facilities (KREI 2008). Furthermore, positive opinions about rural working circumstances (21 percent) among farmers appeared to be very low compared to the negative opinions (78.5 percent) (KREI 2008). This information implies that rather than provision of ICT, actions to promote other social resources may be more relevant to rural development. In addition, such deficient circumstances of rural areas do not properly prepare farmers to take up online activities, as well as reduce incentives for farmers to want to use the Internet. If the main purpose of the rural IT policy is to bring changes that will beneficially contribute to rural life standards and competitiveness, then the relevance of policy actions for rural needs must definitely be taken into account. In short, other basic social policies that may be in favor of rural communities must not be bypassed due to the hypes of new information technologies.

6. CONLUSION

During recent years, a large amount of policy effort has been invested in promoting online access and the use of the Internet in rural areas. The importance of such rural-digital divide has gained more weight based on the perception that new ICT and online network will offset former economic and social disadvantages of time and distance from major markets and social participation. Such a policy paradigm has been predominated by technology-centered thinking that the so-called rural-urban digital divide is simply of unequal technology spread and that once rural communities gain high-speed Internet access and Internet skills alone, all problems of rural under-development will be resolved. Alternative statements have been made against such optimism indicating that causes of rural information disadvantage is more a complex issue embedded within the social context. Even so, much of policy actions have been directed to provision of network infrastructure and Internet access to rural community assumed to improve the living circumstances of rural society.

Such high expectations about the benefits of new ICT for rural development have been prominent in the case of Korea. Strongly empowered by the nation's strong broadband infrastructure capacity and online service management, policy initiatives have aggressively undertaken various actions to link rural Korea online. This paper sought to reassess the Korean rural IT policies giving special attention to the complementary characteristics of information capital and the meanings of information use from the end-users' viewpoint. These perspectives allow this paper's focus to depart from the technology centric framework to appreciate other broad resources existing within rural communities that are essential to complement people's online using capabilities and its outcomes. In the case of Korea, diverse policy actions at multiple levels have been carried out in order to encourage not only online access, but also residents' Internet skills, online contents, and electronic commerce management. Such comprehensive programs deserve to be recognized in terms of their effective cooperation between the central-local and public-private institutions, active participation from local agencies, and humanizing various programs through user-friendly environment and peer-to-peer assistance. Such effort has come to address the rural-urban access divide to a great extent. Importantly, however, rural people's IT capabilities and actual use appears hardly unchanged with extremely minor improvement. Considering that beneficial use of information requires not only technology access but other complementing resources such as people's understandings, interests, knowledge, motivation, economic capacities, market interactions, social participation and needs; rural Korean communities experience many disadvantages. In terms of rural Korea, such general capacities lag far behind the average population level. In short, their general socioeconomic capacity is not well-prepared to effectively make use of the Internet. Further, when defining the needs that rural people perceive important for their life enhancement, other factors aside from online benefits such as basic education, medical and welfare service, and market power are first to come.

This paper, in this respect, encourages rural-urban digital divide policy initiatives to recognize that other complementing elements aside from Internet access must be carefully considered. That is, policies must shift the focus away from technology and toward more comprehensive approaches of dealing with the basic social needs of rural communities. For example, giving equivalent effort to support literacy and basic education, improve existing community services more familiar to farmers, develop off-line channels for rural-urban

interactions, and encourage farmers' participation in policy designing and implementation. Policymakers should take into account the multivariate concerns of rural farmers and how they lack knowledge, online application skills, and incentives to make use of the Internet. Accordingly, policy actions must take a step-by-step approach to support rural community in sequence, to well-prepare their general capabilities to adopt modern social change including online activities. Further recommendation can be made that this would be effectively realized through stronger collaboration with other policy institutions that will complement other non-technology assistance consistently aiming for the goal of rural development. Although such a complicated and comprehensive approach may require a lengthy period of time, and surely a tedious undertaking, it would be the most realistic way to gradually empower the rural community to compete with the mainstream society. If this is not done appropriately and adequately, in the age of the Internet where very much of commerce transaction is conducted electronically, farmers may loose their market power in the agricultural sector.

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