

ICT AND POVERTY: THE INDISPUTABLE LINK

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ABSTRACT

Since the “information society” concept was introduced in the seventies, the correlation between access to information and poverty has been widely acknowledged. The main propositions given were as follows: information leads to resources; information leads to opportunities that generate resources; access to information leads to access to resources; and access to information leads to access to opportunities that generate resources. In an Information Society, the information-poor have also become the resource-poor. This paper attempts to explore the relationship between information and communication technology or ICT and poverty. In Southeast Asia, in particular, the correlation is unmistakable. The higher the human poverty index, the lower the number of ISPs, telephone lines, PCs and TV sets per 1000 persons. The higher the value of ICT indicators (as in the case of Singapore, Brunei and Malaysia), the lower the poverty index.

The paper outlines four major paradigms used in analyzing poverty, namely: the technological paradigm, the economic paradigm; the structural paradigm; and the cultural or values paradigm. There are ICT interventions for any of these four paradigms. Technologically, there are small independent initiatives being undertaken by nongovernmental organizations and governments to help bridge the Digital Divide. The most common of these initiatives is the actual introduction of low-end information and communication technology to impoverished areas. ICT can improve economic policy and facilitate the policy-making process. An array of ICT tools is available to the policy-maker and decision-maker. Foremost in this list of tools are poverty maps, which are made possible by geographic information systems (GIS). ICT can be used for policy advocacy, local governance and educational development. However, the optimum solution that ICT can offer to any undertaking, even poverty alleviation, is knowledge management, a newly emerging discipline that combines organizational dynamics, knowledge engineering and technology to manage the intellectual assets of a system. Central to knowledge management is the concept of knowledge networking.

The paper offers the following recommendations: efforts should be made to develop viable ICT Poverty Alleviation programs; a regional approach to program development should be adopted; small, spontaneous but fragmented initiatives among private agencies and nongovernmental organizations to bridge the Digital Divide should be mainstreamed and coordinated through an ICT for Poverty Alleviation Grants Fund that can be micro-managed by regional agencies; technological interventions should be supplemented by strong content provision and development program support; agencies within the same region should initiate dialogues to determine standards, platforms and protocols for information and knowledge exchange and re-use; the use of poverty maps should be fully exploited; and the educational applications of ICT should be fully supported.

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*Knowledge of speech, but not of silence
Knowledge of words, and ignorance of the Word,
All our knowledge brings us nearer to our ignorance
All our ignorance brings us nearer to death
But nearness to death, no nearer to God.
Where is the life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?*

From T.S. Elliot's, "The Rock"

INTRODUCTION

From 1984 to 1985, the SEAMEO Regional Center for Graduate Study and Research in Agriculture funded a research project entitled *The Information-Rich and the Information-Poor: Two Faces of the Information Age in a Developing Country*². Among other things, the study warned against an emerging lower class composed of the information poor, most of who are found in agrarian societies.

Indeed, ever since Machlup and Porat introduced the “information society” concept in the seventies, the correlation between access to information and poverty has been widely acknowledged. The main propositions given were as follows: information leads to resources; information leads to opportunities that generate resources; access to information leads to access to resources; and access to information leads to access to opportunities that generate resources. We are now in the Information Age, where knowledge is a critical resource and information is a primary commodity.³ It follows that in an Information Society, the information-poor have also become the resource-poor. This paper attempts to explore the relationship between information and communication technology or ICT and poverty, specifically in Asia.

ICT is the collective term given to the new generation (second and third) information technology spawned by the merger of computers and telecommunications. ICT may be Web-enabled, networked, or stand-alone; it may make available an information or knowledge system; or it may generate an information or knowledge product or service. One feature of ICT is the convergence of media (print, audio and video – hence, multimedia) made possible by a common digital platform.

The 2000 Okinawa Summit of G7/G8 nations describes ICT as “one of the most potent forces in shaping the Twenty-first Century...fast becoming a vital engine of growth for the world economy.”⁴ Indeed, ICT may be applied to almost every problem in probably all sectors. Yet, the highest social application of ICT is *poverty alleviation*, since it is the most pressing problem confronting society, in general, and the international development assistance community, in particular. Furthermore, following the propositions given earlier, ICT (specifically, the lack of it) may be considered both as a cause and an effect of poverty.

² Alexander G. Flor. *The Information-Rich and the Information-Poor: Two Faces of the Information Age in a Developing Country*. University of the Philippines at Los Banos, 1986.

³ Marc Porat. *Communication Policy in an Information Society*, in G. Robinson's (ed.) *Communication for Tomorrow: Policy Perspectives for the 1980's*. New York: Praeger Publishers, 1978.

⁴ Okinawa Charter on Global Information Society, G8 Scholarly Publications and Papers, University of Toronto G8 Information Centre.

Correlates of Poverty and ICT: The Case of Southeast Asia

The SEARCA study argued that the widening gap between the information-rich and the information-poor had dire policy implications particularly in the agricultural sector. The existence of this gap, not only in this sector but in all other sectors associated with development, is now widely recognized due primarily to the July 2000 Okinawa Summit of the G7/G8 nations. Today, this gap is known as the Digital Divide.

Nowhere else in the world is the Digital Divide considered more of an enigma than in Southeast Asia. This region boasts of countries that are in the forefront of digital technology. Singapore, Taiwan, Malaysia and Thailand are producers and exporters of such technology. Also in this region are countries, which may be considered as the most deprived in ICT – Laos, Cambodia, Myanmar and Vietnam.

To begin with, the differences in the standards of living among countries within the region are quite glaring. Based on the 1999 UNDP Human Development Report, the human development index (HDI), human poverty index (HPI) as well as the HDI ranks of ten Southeast Asian countries are given in Table 1.

Out of 174 countries, Singapore is ranked 22nd in human development, while Lao PDR is ranked 140th. Brunei Darussalam is ranked 25th while Cambodia is ranked 137th. Malaysia is ranked 56th, while Myanmar is ranked 128th. Within the same region, we find countries classified under high, medium and low human development.⁵

Singapore and Brunei's poverty indices are negligible, while Myanmar and Lao PDR's (38.9 and 32.3, respectively) are quite high. The poverty index of Malaysia, Thailand and the Philippines (14.2, 18.7, and 16.5) are within the same range, while those of Indonesia and Vietnam (27.7, 28.7) are moderate.

The HDR database also offers some interesting insights on the correlation between ICT and poverty. Data on four major ICT indicators, namely, internet hosts per 1000 persons, telephone lines per 1000 persons, personal computer ownership and television ownership were placed side by side with the aforementioned poverty indices. The correlation is unmistakable.

The higher the HDR rank, the higher the ICT indicator values. The higher the human poverty index, the lower the number of ISPs, telephone lines, PCs and TV sets per 1000 persons. The higher the value of ICT indicators (as in the case of Singapore, Brunei and Malaysia), the lower the poverty index.

⁵ *Human Development Report 1999*, United Nations Development Program and Oxford University Press: New York and Oxford, 1999.

Table 1. Poverty and ICT Indicators

HDI Rank	COUNTRY	Human development index	Human poverty index	ISPs/ 1,000	Telephone Lines/ 1,000	PCs/ 1,000	TV/ 1,000
22	Singapore	0.887911	..	15.11	513	216.8	361
25	Brunei Darussalam	0.877795	..	2.41	263	..	417
56	Malaysia	0.768328	14.2	2.09	183	42.8	228
67	Thailand	0.753147	18.7	0.03	70	16.7	167
77	Philippines	0.739973	16.3	0.21	25	9.3	125
105	Indonesia	0.680862	27.7	0.11	21	4.8	232
110	Viet Nam	0.663824	28.7	no data	16	3.3	180
128	Myanmar	0.579768	32.3	..	4	..	7
137	Cambodia	0.514409	no data	0.01	1	..	9
140	Lao PDR	0.491107	38.9	no data	6	1.1	10

The gap between hardware and software capabilities also exists. For instance, the Philippines is considered to be the second largest exporter of ICT professionals and software developers next to India. Yet, it has hardly caught up with broadband and wireless technologies. The Digital Divide within sectors is likewise formidable. In Thailand and the Philippines, the business sector is fast catching up with its counterparts in Singapore ICT-wise. However, the educational sector is lagging far behind. At the tail end of the ICT utilization spectrum is the agricultural and rural development sector with the least number of ICT users, applications and solutions. In these sectors, we find the preponderance of the information-poor.

Poverty Paradigms

The Asian Development Bank defines poverty as the deprivation of essential assets and opportunities to which every human is entitled.

*Everyone should have access to basic education and primary health services...Beyond income and basic services, individuals and societies are also poor-and tend to remain so-if they are not empowered to participate in making the decisions that shape their lives. Poverty is thus better measured in terms of basic education; health care; nutrition; water and sanitation; as well as income, employment, and wages.*⁶

There seems to be a general agreement on the definition of poverty. As to its causes, however, there are differing points of view. These may be classified under four

⁶Asian Development Bank, *Fighting Poverty in Asia and the Pacific: The Poverty Reduction Strategy, Policy papers, November 1999*

major paradigms used in analyzing poverty, namely: the technological paradigm, the economic paradigm; the structural paradigm; and the cultural or values paradigm.⁷

Technological Paradigm. Adopting a point-of-view based on technological determinism, many technologists and engineers believe that the primary cause of poverty is the lack of technological know how in the developing world. Their premise is based on the observation that Western nations are rich because they employ modern technology in agriculture, industry, transportation, telecommunications and health. They argue that the Third World will solve most of its problems by adopting new technology. They are firm believers of the concepts of "technical assistance" and "technology transfer" wherein the know how of the West is transplanted, modified and practiced in the developing world. This is primarily accomplished through the services of expatriate experts or consultants.

Economic Paradigm. Economists argue that poverty is caused by the lack of sound fiscal and/or monetary policies within the government. Hence, the IMF occasionally recommends policy reforms for developing economies.

Structural Paradigm. Most political scientists and ideologues believe that poverty is a function of the social structure. The primary exponents of this view believe that the only way to combat poverty is to change the so-called System or the government. The structural paradigm distinguishes between elites and the masses, centers and peripheries, conflict of interests and harmony of interests. From this paradigm, we borrow phrases such as "top down" and "bottom up."

Cultural Paradigm. Some anthropologists and sociologists argue that poverty is a function of culture or social values. Twelve years ago, an anthropologist colleague from the University of the Philippines observed that the so-called Asian tiger economies had predominantly Chinese populations or were, at one time or another, influenced by Confucian teachings (i.e., Singapore, Taiwan, Korea, etc.). The countries that lagged behind were predominantly Malay (i.e., Malaysia, Philippines, Indonesia). He concluded that with the proper values and worldview, one can combat poverty effectively. In the Philippines, a Senate Committee found that the erosion of moral values had direct links to poverty (the Shahani Committee, 1990). Such an erosion brings about corruption, exploitation and greed which all lead to poverty. The 1999 ADB annual report, stating that the Asian economic crisis was in no small measure caused by corruption, is supportive of this view.

Which of these paradigms should be adopted in the use of ICT for poverty alleviation? The situation reminds us of the poem *The Blind Men and the Elephant*⁸ wherein six blind men attempted to describe an elephant through the part of the animal that they approached and touched. In a way, many of us are blind men when it comes to poverty. We approach the issue from one direction and arrive at a conclusion of what it is

⁷ Alexander G. Flor and Ila Virginia Contado-Ongkiko. *Development Communication Concepts and Approaches*. UP Open University: Los Banos, 1998.

⁸ By John Godfrey Saxe

based on the part we address. One thing is certain, however. There are ICT interventions for any of the four paradigms enumerated above.

ICT INTERVENTIONS

Bridging the Digital Divide

All over the world, small independent initiatives are being undertaken by nongovernmental organizations and governments to help bridge the Digital Divide. The most common of these initiatives is the actual introduction of low-end information and communication technology to impoverished areas.

In June 2000, CNN aired a special that was co-sponsored by the World Bank and the Bill and Melinda Gates Foundation. The thirty-minute documentary, entitled “*Virtual Villages: Technology and the Developing World*,” featured four segments, each of which showed dramatic results in the introduction of information and communication technology to poor villages. The opening spiel of the documentary relates:

*Technology has become the driving force of change in the modern world. It has altered our economic structures and the ways we communicate. It has even changed how we relate to one another. Examine how technology -- even in small amounts -- is helping developing nations and communities overcome convention and tradition to take leaps forward.*⁹

Bangladesh. Among the more successful financing models ever to emerge from the Third World is the micro-credit system introduced by the Grameen Bank of Bangladesh. Grameen’s founder and director, Professor Muhammad Yunus, has again embarked on an innovative undertaking based on an idea that is as simple as it is elegant. The bank has initiated a cellular phone project, dubbed the Grameen Phone Company, which would put a mobile phone in some 45,000 villages, giving residents access to ICT. Each mobile phone is acquired by an individual through a small loan from the bank. This phone becomes a village telephone service provider, earning income for the owner besides providing a much-needed utility to the community.

Professor Yunus is following this up with an experimental Village Computer and Internet Program or VCIP, which would provide an email and Internet service to villagers. Instead of paying for phone calls to contact relatives in the cities or friends abroad, the villagers will now be able to avail themselves of email for a fraction of the cost of a long distance call. A simple form of e-commerce will also be initiated by this system. Farmers will now be able to check out market prices and study the list of wholesalers in Dhaka by surfing the Web.

⁹ http://www.asia.cnn.com/SPECIALS/200/virtual_villages

Dominican Republic. El Limon is a tiny village in the Ocoa region of the Dominican Republic. With the help of a volunteer, Jon Katz of Cornell University, its residents built a local hydroelectric system to generate enough electricity to light their houses and their school house. CNN continues:

Once they had electricity, the villagers hooked up a donated computer to the Internet using a digital radio and an antenna relay system that connects to the nearest phone line, ten miles away. Now, their school, which has no library – in a village with neither telephones nor indoor plumbing – has a connection to the World Wide Web.

The students in El Limon are learning digital video editing on a computer and are making their own documentary about the hydroelectric project. They plan to show the video to other communities in the area – in the hope of repeating El Limon’s success story.¹⁰

India. The documentary featured several ICT-related interventions in a number of cities in India. The most remarkable, however, was an experiment conducted by the Dr. Sugata Mitra, a researcher for the NIIT software and education company. Dr. Mitra’s “Hole in the Wall” Project put an Internet kiosk in a poor Indian neighborhood. After some time, children who could neither read nor write learned how to use the computer without the benefit of any instruction whatsoever.

These three cases reveal how the mere introduction of technology in impoverished areas result in immediate positive impacts. However, there is more to ICT than mere technology.

Poverty Mapping

Information and communication technology can improve economic policy and facilitate the policy-making process. An array of ICT tools is available to the policy-maker and decision-maker. Foremost in this list of tools are poverty maps, which are made possible by geographic information systems (GIS).

The Asian Development bank defines poverty maps as spatial descriptions of the distribution of poverty in any given country. Hence, they are important tools in guiding spending for governments.¹¹ Poverty mapping combines geographically-referenced survey and census data to generate poverty and inequality profiles at low levels of aggregation. Additionally, poverty maps based on highly disaggregated data, serve benchmarking, as well as monitoring and evaluation purposes.

¹⁰ *Ibid*

¹¹ <http://www.adb.org/Statistics/Poverty/P.asp=poverty>

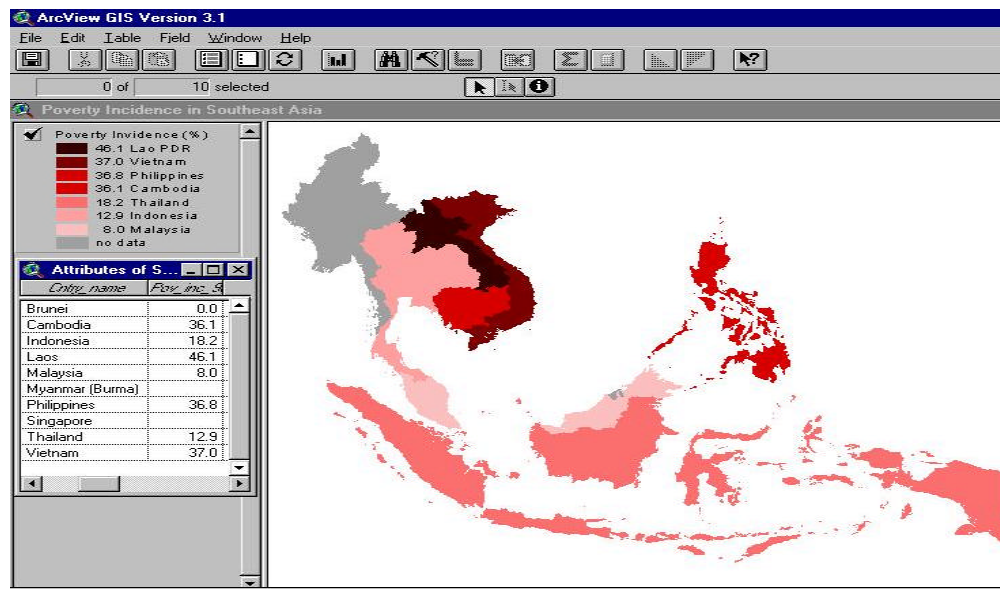
For purposes of example, a poverty map of Southeast Asia based on non-disaggregated data is given below.

Table 2. Poverty Incidence in Southeast Asia with the Corresponding Gini Values

Country	National Poverty Incidence	Gini Coefficient ¹²
Cambodia	36.10	00.37
Brunei Darussalam	-	-
Indonesia	18.20	00.36
Lao PDR	46.10	00.30
Malaysia	08.00	00.49
Myanmar	-	-
Philippines	36.80	00.49
Singapore	-	00.39
Thailand	12.90	00.44
Vietnam	37.00	00.35

Based on the ADB-EDSD Poverty Database SDBS

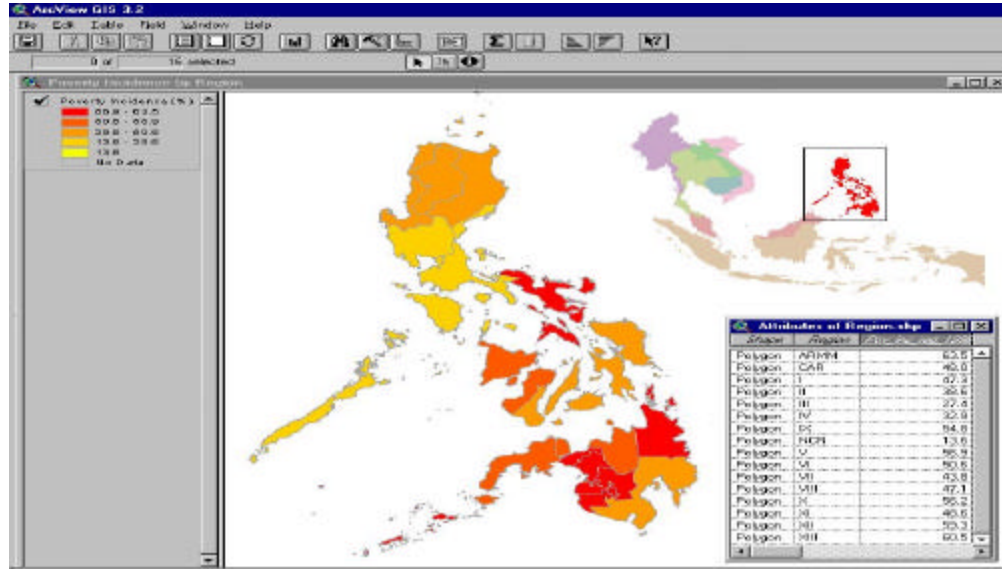
Figure 1. Poverty Map of Southeast Asia



¹² The Gini coefficient is the most commonly used indicator of inequality. It ranges in value from 1 to zero, one being the situation wherein inequity is highest (only one individual owns the wealth) and zero being the situation wherein wealth is distributed equally.

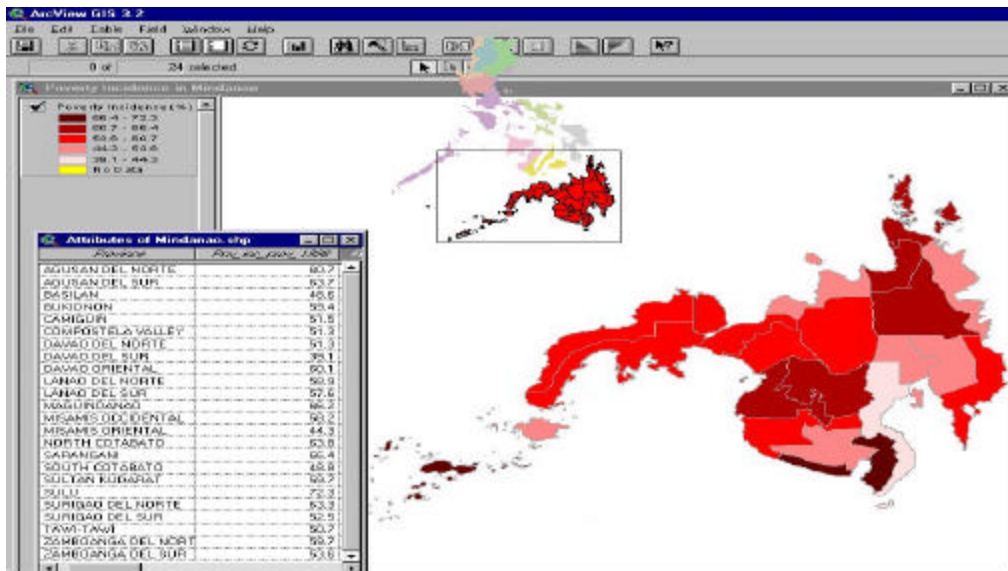
A poverty map of the Philippines based on data disaggregated by region would appear like the following.

Figure 2. Poverty Map of the Philippines Disaggregated by Region



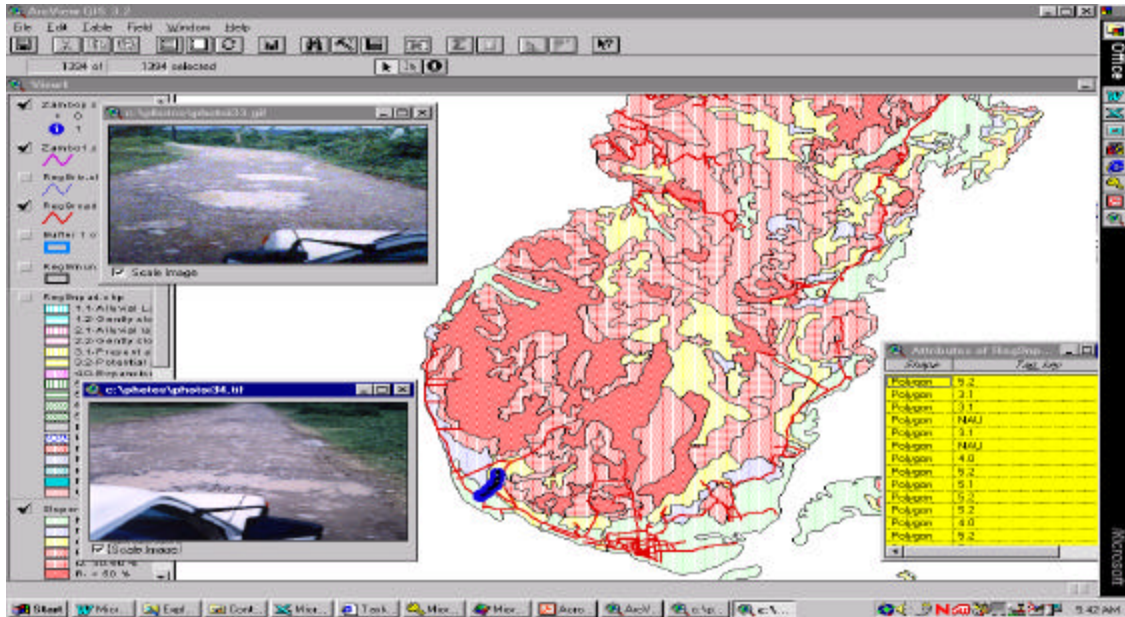
Further disaggregated by province, the following gives a poverty map of Mindanao.

Figure 3. Poverty Map of Mindanao Disaggregated by Province



Nevertheless, the most useful poverty maps require large data sets representative at small geographical units such as municipalities and districts. Such data sets are difficult to acquire, thus making it impossible to generate detailed poverty and inequality profiles. A recent ADB project, however, made use of highly disaggregated data on the province of Zamboanga del Sur, but of a different nature – road networks.¹³ An output map shown within the ArcView GIS software window is reproduced herein for illustrative purposes.

Figure 4. Output Map of the ADB Rural Productivity Enhancement Project



ICT for Policy Advocacy

The second longest coastline in the entire world may be found in the Philippines. It is not surprising then to find that the poorest of the poor, composed of marginal fishers, are found in the coastal areas.

Early last year, an online information and educational exchange between the Coastal Resource Management Project (Philippines), Silliman University, and the University of Washington was initiated through the financial support of USAID and the National Science Foundation. An interactive website entitled the Internet Center for Coastal Management (ICCM) was uploaded allowing threaded discussion, exchange of computer files, linkages to other websites, and recording of personal information. ICCM

¹³ Stephen P. Groff, Neil Thurston and Tom Chidley. *Infrastructure for rural productivity enhancement: A GIS-based approach to rural development project management in the Philippines*. Asian Development Bank: Manila, 2000.

was password protected and was intended to function as a working area for people with a common interest in coastal management.

In March 2000 the CRMP-Philippines posted a draft Executive Order that was expected to be signed into law in June by President Joseph Estrada identifying integrated coastal management as a national policy. The EO was posted on the ICCM and was open for comment and review by various academic and government personnel. The ICCM experience is illustrative of the potentials of ICT for policy advocacy. However, in late 2000, the website had to be discontinued since a monitoring of its utilization revealed a minimum number of hits. This, of course, is to be expected because a special interest website cannot be expected to compete with commercial or broad-range content sites. The ICCM had very specific clientele with defined uses for the site. Unfortunately, numbers mattered with the evaluators. Perhaps, an option that may be explored in the future for similar sites is the linking up of the content with a program of related on-the-ground activities to ensure frequent and continued use.

ICT in Local Governance

The Okinawa Charter endorses the “active utilization of IT by the public sector and the promotion of online delivery of services, which are essential to ensure improved accessibility to government by all citizens”

Local governance, in fact, is one of the least explored, yet perhaps one of the most promising areas of ICT applications in Asia. For instance, databases on local government assets and community resources facilitate decision making among local government executives and policy making among members of local councils. Geographic information systems (GIS) make invaluable tools for land use planning and local government investments.¹⁴ Multimedia applications such as digital video can be effective media for citizens’ education and process documentation of governance success stories.

ICT for Educational Development

Much excitement in international development circles has been generated by the educational applications of information and communication technology (ICT). In fact, some sectors are of the opinion that ICT can only effectively combat poverty directly through education. From South Asia to the Pacific islands, experiences abound in the use of communication media and the Web for open learning and distance education. Best practices and lessons learned from these experiences should be collated and shared. Strategic options and potentials should likewise be explored.

¹⁴ *In the Philippines, the Internal Revenue Allotment (IRA) or the share of the municipal government in tax revenues, will only be released by the national government upon the submission of a Land Use Plan. Geospatial Information Systems are now being tapped by most progressive municipalities to generate such a Plan.*

The Okinawa Charter recommends “ the development of human resources capable of responding to the demands of the information age through education and lifelong learning...” Foremost in the educational agenda is the development of ICT manpower that is versed not only with hardware and software expertise but also with content development skills. A higher-level ICT professional who looks into the social and strategic impact of the technology should be produced by the educational sector.

Knowledge Management

The optimum solution that ICT can offer to any undertaking is *knowledge management*. Knowledge management (KM) is a newly emerging discipline that combines organizational dynamics, knowledge engineering and ICT to manage the intellectual assets of an organization or, as in the case of development projects, a *system*. Much of KM experience has been limited to the private sector. Although the World Bank has embarked upon a KM Program in 1997, few development agencies have followed suit with comparable success. However, knowledge management offers vast potentials and much promise to poverty alleviation initiatives, specifically in areas of policy, strategic planning, and monitoring and evaluation. Central to knowledge management is the concept of knowledge networking.

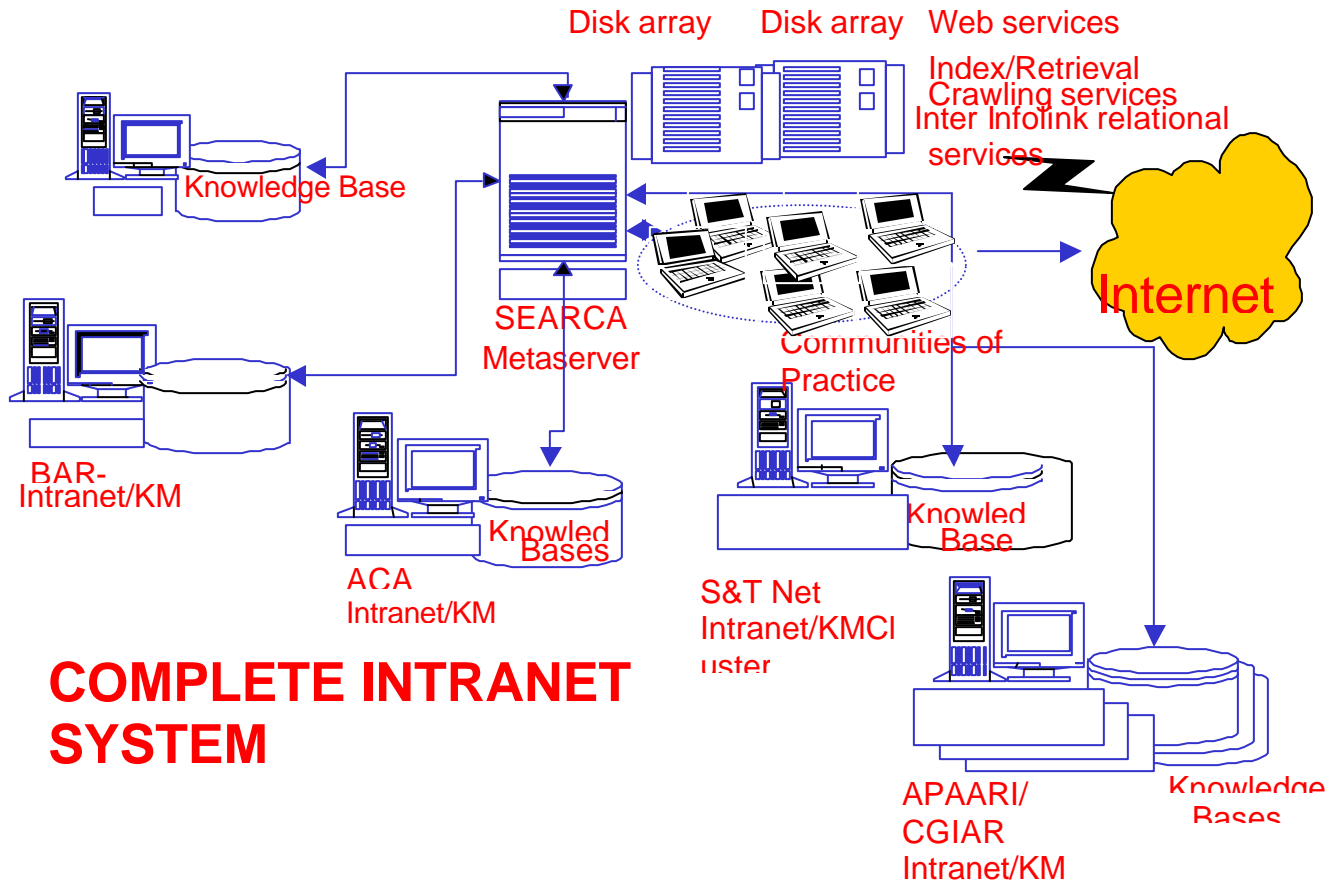
The Okinawa Charter proposes the “development of information networks offering fast, reliable, secure and affordable access through competitive market conditions and through related innovation in network technology, services and applications.” Establishing knowledge networks to combat poverty fits snugly into this recommendation.

A knowledge network is a complete Intranet system. ¹⁵ Its main function is to facilitate the sharing and re-use of information and knowledge between and among the nodes of the network. At present, two knowledge networks are hosted by SEAMEO-SEARCA: the ASEAN Integrated Pest Management Knowledge Network, established in 1998; and the Biotechnology Information Center, established in 2000. A third knowledge network known as the Southeast Asian Sustainable Agriculture Knowledge Network (SEASAKNet) is being proposed.

Figure 5 shows the configuration of a proposed regional knowledge network.

¹⁵ Matthias Leibmann, *A Way to KM solutions: Things to Consider When Building Knowledge Management Solutions with Microsoft Technologies*. World Wide Technical Services, 1999. Microsoft Corporation. www.microsoft.com

Figure 5. SEASAKNet Network Configuration



Configuration based on Microsoft's KM White Paper (Leibmann, 1999)

Similar regional knowledge networks on natural resources management should be established to have a direct impact on poverty. Two of the most critical areas of natural resources management in Asia are coastal resources and water resources.

Southeast Asia is home to the two largest archipelagos in the world, Indonesia and the Philippines. The Sulu-Celebes area is the Vavilov Center for marine diversity. However, coastal resources in Asia are fast dwindling because of mismanagement. Because of the alarming rate of resource depletion, countries within the region have undertaken several resource management projects. Best practices and lessons learned have been documented in these projects. However, these best practices and lessons learned should be shared among these countries since coastal resources in archipelagos recognize no geopolitical boundaries. A regional knowledge network enabled by information and communication technology is now being proposed for this purpose. Water resources, on the other hand, are becoming more and more of a major concern. The World Bank is now funding the National Water Information Network in the Philippines. The biggest barrier to knowledge networking at the regional level, however, is the lack of defacto standards for information sharing and data exchange.

LESSONS LEARNED

More than twenty-five years have passed since the first technical assistance project to apply information and communication technology to problems of underdevelopment, foremost of which is poverty. The World Bank Communication Technology for Rural Education (CTRE) Project, which began in 1975, made use of a network of community radio stations based in state colleges and universities in the Philippines. Technology has drastically changed since then, faster than our ability to apply the lessons learned. However, we could list a few lessons that are not technology-specific and that would be applicable to a broader range of conditions.

The correlation of ICT and poverty is unmistakable. The international development assistance sector's awareness of this was highlighted by the G7/G8 Okinawa Summit in July 2000. Bridging the Digital Divide is now in the list of priorities of funding agencies and governments alike. In spite of this commitment, however, a realistic and feasible agenda to apply ICT for poverty alleviation purposes, appropriate for developing countries seem to elude most development assistance agencies. Perhaps, the sector should invest more on program planning and development initiatives at this juncture. An indicative ICT research and development agenda, which form part and parcel of SEARCA's Knowledge Management Program, is appended in this paper. Nevertheless, the following lessons learned may serve to guide development agencies in firming-up their respective ICT agendas.

Firstly, technological interventions described in the CNN documentary *Virtual Villages* show that small independent projects are being done spontaneously by private agencies and nongovernmental organizations all over the world. Instead of ignoring these small initiatives, the international development assistance sector should take advantage of this trend by setting up an ICT for Poverty Alleviation Small Grants Fund that would facilitate, coordinate and support these undertakings. The Fund may be micro-managed by appropriate regional agencies.

However, it should be emphasized that technological interventions alone cannot bridge the Digital Divide. More important than technology is the *content* made available to the user. Even more important is the *programmatic support* that would run parallel to the provision of hardware, software and content. This is the lesson learned in the ICCM experience.

Additionally, financial trends in Southeast Asia picture an economy that transcends national boundaries, manifesting the drift towards globalization. ICT trends also exhibit a parallel behavior. Does this imply the desirability of a global ICT agenda? Globalization, may prove to be too unwieldy at this point. A more manageable option would be intermediate between national and global. Hence, an ICT development assistance program will make more sense if it is neither national nor global, but *regional*

in scope, an option that is being adopted by the knowledge networking initiatives described earlier.

This may pose problems among international lending institutions such as the World Bank, the Asian Development Bank, and the Japan Bank for International Cooperation, since countries, not regions, apply for development assistance loans. Definitely, ICT infrastructure development should be country-specific, at the most. However, regional technical assistance should serve a coordinative role for network connectivity and compatibility purposes.

The Okinawa Charter likewise proposes the establishment of a Digital Opportunity Taskforce (Dot Force), which will “actively facilitate discussions with developing countries, international organizations and other stakeholders to promote international cooperation with a view to fostering policy; regulatory and network readiness; improving connectivity; increasing access and lowering cost; building human capacity; and encouraging participation in global e-commerce networks.” If any progress is at all to be achieved in the area of regional knowledge networking, then the scientific community of Southeast Asia should address this recommendation, sit down and agree on common standards, platforms and protocols for information exchange and knowledge sharing.

Lastly, education remains the most viable application of ICT considering the economic returns of a highly trained workforce. Studies conducted in the Indian Institute of Technology in Mumbai estimate a foreign exchange earning of US \$3 Billion in 1999 for ICT products and services, a bulk of which were generated by hardware specialists and software programmers who have migrated to Europe, Australia and the United States for lucrative careers.¹⁶

SUMMARY OF RECOMMENDATIONS

The 1997 Human Development Report proposed six essential actions to eradicate poverty, foremost of which is to “empower individuals, households and communities to gain greater control over their life and resources.” Greater control requires greater access to knowledge that ensures food security and economic well-being as well as to the tools that enable this access.

In summary, this paper forwards the following recommendations:

1. Efforts should be made to develop viable ICT Poverty Alleviation programs. These programs should be coordinated across agencies in the best spirit of networking, to ensure proper focus in resource use and synergy in development efforts.

¹⁶ *The Philippines, which ranks second to India in ICT manpower exports earned US\$ 22 Million in the same period, according to some estimates.*

2. A regional approach to program development should be adopted since ICT and poverty alleviation transcend national borders.
3. The small, spontaneous but fragmented initiatives among private agencies and nongovernmental organizations to bridge the Digital Divide should not only be encouraged and facilitated but be mainstreamed and coordinated by putting up an ICT for Poverty Alleviation Small Grants Fund that can be micro-managed by regional agencies.
4. Technological interventions should be supplemented by strong content provision. It should run parallel with a development program, thus providing mutual reinforcement between ICT utilization and impacts.
5. Governments and government agencies within the same region (e.g., Southeast Asia) should initiate dialogues to determine standards, platforms and protocols for information and knowledge exchange and re-use. A regional approach to knowledge networking should be adopted.
6. The use of poverty maps should be fully exploited through the collection of highly disaggregated census and economic data.
7. The educational applications of ICT should be fully supported for their economic potential.

Following these recommendations may enable us at the development assistance sector to ensure that wisdom is not lost in knowledge and that knowledge is not lost in information in our poverty alleviation undertakings.

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APPENDIX
PROPOSED SEAMEO-SEARCA ICT AGENDA
2001 - 2002

Sub-Program 1. Establishing Regional Knowledge Networks on Food Security and Natural Resources Management

- Project 1. Sustainable Agriculture Knowledge Network
- Project 2. Coastal Resources Knowledge Network
- Project 3. Water Resources Knowledge Network
- Project 4. Food Safety Knowledge Network

Sub-Program 2. Institutional Strengthening of Southeast Asian Agricultural Universities for Information and Knowledge Networking

- Project 1. Knowledge Audit of SEA Agric Universities
- Project 2. Establishing Standards and Protocols for Knowledge Capture & Exchange
- Project 3. Capacity Building of SEA Agric Universities

Sub-Program 3. Institutional Strengthening of Selected National Agricultural Research Centers in Southeast Asia for Knowledge Networking

- Project 1. Knowledge Audit of NARCs
- Project 2. Establishing Standards and Protocols for Knowledge Capture & Exchange
- Project 3. Capacity Building of NARCs

Sub-Program 4. Sustainable Development Applications of Geospatial Information Systems

- Project 1. GIS in Agricultural and Fisheries Research and Investment
- Project 2. GIS Applications in Governance

Sub-Program 5. Poverty Mapping of Southeast Asia

- Project 1. Poverty Mapping of Indonesia and the Philippines
- Project 2. Poverty Mapping of Cambodia, Laos and Vietnam

Sub-Program 6. Documentation and Exchange of Indigenous Knowledge and Best Practices in Sustainable Agriculture

- Project 1. Indigenous Knowledge Systems on SA and NRM in the Cordilleras
- Project 2. Indigenous Knowledge Systems on Medicinal Plants in Palawan
- Project 3. Ethnovideographic Documentation of Biodiversity Conservation of Subanons in Mt. Malindang.

Sub-Program 7. Poverty Alleviation Applications of ICTs

- Project 1. Tambuli II: Community Cable TV and Cable Modem Interface
- Project 2. Low-Cost ICTs for Rural and Peri-Urban Communities in the Sub-Mekong Delta