T	A Village that Learns – Bridging a Rural Digital Divide in Thailand	Doc no: Telwg30/ TELE/06

Agenda item : 6	APEC Telecenter Workshop	Submitted by: Thailand

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APEC Telecommunications and Information Working Group
30th Meeting | 19-24 September 2004 | Singapore

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Bridging a Rural Digital Divide in Thailand

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Introduction
Thailand started her first IT Policy in 1996 with the aim for moving towards an information economy. The term "information infrastructure" was recognized as one of the three main pillars for development. In 2001, twenty-one telecenters were established as pilot projects as initatives by various organizations, both in the public and the private sectors. The National Electronics and Computer Technology Center (NECTEC), a quasi government agency specialized in the development of information technology, was responsible for five pilot sites. The study was on the theme of strengthening the communities to adopt and own the new tools according to their needs, in order to support the knowledge and economic development of the communities. We learned how to define such needs and the associated technology solutions. All centers were managed and financed by the communities successfully within 18 months of introduction.
In one of the five sites, Ban Samkha was selected as a site for further study on the theme of "a village that learns". The theme was chosen in order to apply the community of practice in self sufficiency, knowledge recovery and environmental revival processes to reduce the poverty within the village. The results of our progress are reported in this paper.

Why "a village that learns"?
"A Village that learns" project aims to create knowledge-based society in communities so that they can be sustainable and independent. The project promotes awareness of the importance of learning among people in communities and agricultural rural area as well as encourages them to express their opinions, process, decide and practice (by using learning by doing concept). Information Technology is used as a tool to support community management system to be more effective.
We believe that the knowledge-based society will enable Thai community to improve its livelihood and reduce poverty. In the past thirty years, the development process by using money, capitalism or external economic forces failed repeatedly in solving poverty problem in Thailand. The hypothesis of this project is to solve the poverty problem by developing knowledge in parallel with human resources for creation knowledge and continuation of the local wisdom through life-long learning in Thai community.

The Telecenter Initiative in 2001
From a pilot funding of the Ministry of Treasury in 2001, NECTEC was responsible for selecting and developing four telecenter sites. Our process involved site surveys and evaluation of the community leadership, readiness of the pre-requisited infrastructures such as electricity and telephone lines. We chose to pilot the four telecenters in the North, Northeast and eastern parts of Thailand. We added the fifth telecenter in northern Thailand after one year.
In brief, each telecenter was defined, planned and managed by the communities. NECTEC researchers assisted the development process of each communities by assisting with the technical parts, and the first year funding of the start-up set of equipment and operation expenditure. By and large, a typical pilot telecenter started with two PCs, one fax

machine, one printer and one digital camera. The most successful business model was to run the telecenter as a community "Internet Café". Only one telecenter staff is required to handle all the servicing chores in the shop. The staff was recruited locally, with frequent visit from NECTEC researchers to make sure that he/she is trained to manage the telecenter both technically and businesswise.

We learned that a successful telecenter is one that caught the attention of the community leaders who are visionary and put the efforts to do fund-raising to add more equipment to the center and conduct training for kids. Schools can also be considered a good location to become a community telecenter because of the high concentration of kids who are attracted to the exciting technology.

Two of the most successful telecenters are managed by monks and temples. One temple in Samutsakorn, about 80 km east of Bangkok, managed to run a classroom with 20 machines and regular classes free of charge for the children in that village for the whole year. Another temple constructed a mobile classroom in a bus, equipped with 20 PCs, special tables and chairs with air conditioner. The bus was managed from a philanthropist fund and was heavily booked to go round the country.

Ban Samkha Project

Among many telecenters in the pilot operation, Ban Samkha, about 120km south of Chiangmai in northern Thailand, is an exceptional village in which a number of coordinated experiments took place. Thanks to the attention of the supporters of the village, many groups of people ran a study of the village and introduced many development programs to the village, with the full participation of the community leaders. A woman teacher in the village, Ms Srinuan, has been the champion to the development at the Ban Samkha School study center..

The project evolved during the past three years in many phases of changes. The list below summarizes what happened at the village.

- **Community debt awareness program, 2001** – this open workshop aimed at a self realization of the holistic problem solving starting with the openness among the community members. Each of the family declared their debts, their problem with insufficient income generation and a simple arithmetic helped adding up the total amount. It was amazing to know that in this little village of 100 households, their combined debt was approximately 30 million baht (USD 750,000). The awareness changed the behaviors of the villagers. The spend less on alcoholic drinks and re-finance their debts to the sources with less cost. They work harder to relieve their debt burdens.
- **A constructionism Laboratory, 2002** – some computers and accessories were donated to the school, including a subsidized telephone connection to access the Internet. Several programs in the laboratory were carried out in addition to training how to use computers, word processor, spread sheets. Text editing in the local language called "Lanna" was also made available. As a result of the first activity, the spreadsheet program was turned into a "household accounting" application for each household to enter their income/expense information in order to get some summary reports in return. By adding up all household income and debts, the village statistics can automatically generated.
- **The high-speed Internet access, 2003** – This was made possible through the support of NECTEC. We used a satellite based IP service of CS Loxinfo Company to serve the local-area network in the classroom. There are about 20 PCs in the classroom, with five of them having global Internet access, and the remaining PCs with only campus access. The limitation was due to the business arrangement of the satellite service.

- **The community radio station, 2003** – The blend between school, community and the administrators led to an introduction of the community radio system which works in tandem with the "audio towers" in the village. In this project, NECTEC developed and implemented a low-cost radio transmitter for Ban Samkha School. The transmitter is augmented by a "remotely controlled audio amplifier" to facilitate audible sounds to every household in the village. The radio program operates twice a day during the morning and lunch break. Students were trained in radio-station programming and announcement skills by the local teacher's training college. It was found that the device is a good tool to stimulate public-speaking skill, reading/writing and summarizing techniques for students.
- **A community bank, 2003** – This project was in cooperation with Krung Thai bank, the largest government owned commercial bank in Thailand. The community representatives, including students, were made part of the bank management. Students were assigned to study all the loan projects of adults. Through this cooperation, the Bank found that the risk of losing out to a "non-performing loans" or NPLs was greadly reduced through the knowledge program.

New Applications and Activities in 2004

The basic development phase of Ban Samkha for information access was more or less completed in 2003. The "telecenter" theme of the project has been changed to a higher level for "knowledge creation" and "knowledge usage" through a new set of initiatives.

These programs involved the following technology activities:

- **Village household database on Internet GIS** – A simple geographical information system (GIS) was prepared for the community as a versatile based map. NECTEC also supported the funding for the making of high-resolution aerial photographs of the village to work with the GIS. The project involved an installation of the village central server and a data clearing house program. The first set of data made by the research team was the household locations, using GPS device. Thereafter, the local data regarding the household registration (owner names, house number, number of "homestay" rooms available, home-made products etc." were entered by the villagers. These data items can be retrieved on a user friendly map display.
- **Agricultural Telemetering devices (Field server)** -- These are small electronic devices which measures air temperature, barometric pressure, relative humidity, solar radiation, rain guage, anemometer etc. which can be connected to the mobile phone network in order to transmit the measurements to a central file server. The telemetering devices are very useful for agricultural research and management of the agricultural activities in the community.

Together with the technology components, we made a number of applications of the technology infrastructure through the creation of the following programs:

- **Content programs for natural resource management** – These are the use of GIS terrain map to learn how to locate a check-dam which can be built to effectively trap the rain water from flowing down the mountain quickly. It is a visualization of the map which has a powerful impact to a successful water management. The village has suffered from mountain woodlogging to a dangerous level where a human intervention to rehabilitate the forest is required. Check-dams are small water blocking plates made of locally available materials (woods and a small amount of concrete). Each of them can

help sustaining rainwater from flowing down the mountain too quickly. A dam can help keeping soil moisture for months. Through this simple device, new trees can be nurtured and within three years, they will grow big enough to shelter the soil under them and can keep the soil moisture even without the check dams.

- **Content programs on local herbs and biodiversity** – Most rural villages in Thailand are rich with the local wisdoms on herbs and biodiversity. Information technology can be a great tool if there is a proper application program to assist these activities. The team of researchers from the Hydro and Agro Informatic Institute (HAII) is conducting this work together with the local participation to create the datawarehouse and knowledge repository for herbs and biodiversity. An archive of photographs and geographical locations of rare herbs have been documented. At some locations, the weather conditions are continuously monitored through the use of Field servers. Most of the data retrieval are done through the map graphical user interface.

- **Knowledge programs** – The purpose of these programs are to interact with the community so that a hands-on knowledge creation through real experience can be facilitated. So far, three programs have been conducted in conjunction with other communities who share the knowledge or who are the "source" of knowledge and experience. There programs are: Summer Camp – IT for Life, Natural Resources Management Camp, and Agriculture for Life.

Concluding remarks

The development of telecenters in Thailand have come a long way. An in-depth case study of Ban Samkha reveals that there are many things that can be done after the basic "information access" obstacles have been overcome. The theme "a village that learns" helped researchers and the villagers in embarking upon a series of knowledge programs which will soon let us understand the techniques to make learning more effective in the Thai villages. We expect some of the knowledge and experience are applicable (and repeatable) for other places, especially on the experience of management of projects.