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IT for Poverty Reduction

Sample cases from Thailand

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Contents

Preface

This is a book on the novel applications of Information and Communication Technologies (ICTs) for development. It describes eighteen selected projects in Thailand that address the issue of poverty reduction. The selected projects are those with clear objectives and methodology to solve the primary problems of the countries: poverty and sustainable development. These projects are neither the largest nor the most sophisticated ICT investment of the country.

Some of the projects have been initiated over five years ago with great success (e.g., Plant Genetic Conservation Project, SchoolNet Project, IT for Inmates, Automatic Web Translation, Distance Learning via Satellite), some of them are very new (Data Catalog for Community Products, Ultra Low-cost Computers). All of the projects show the high level of community participation and the cooperation between the public and private sectors. Some projects already had made a clear impact on the country because they have grown beyond being a pilot project, and the implementation is now nationwide.

It is found that most successful projects have clear focus on the primary problems to be solved: disaster avoidance, productivity improvement, education, employable skill development and making the Internet and IT more affordable.

The purpose of this publication is to share the knowledge gained through these projects with all of our readers, who may be undertaking your own development somewhere in the world.

This publication is a short-form summary of our full-featured documentation in Thai language of the same title. The full documentation in Thai language is scheduled to be released in late December 2003.

I would like to thank all the project contributors who cooperate with this documentation project, as well as the working group for the documentation of these projects. Special thanks to our advisors: Dr.Pairash Thajchayapong and Mr.Paron Israsena, and my co-editors and contributors: Mr. Direk Charoenphol and Dr. Chadamas Thuvasethakul.

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Introduction

Concept of Poverty

That poverty is a multi-dimensional concept is beyond dispute. Poverty can be looked upon as a state of powerlessness of a person in a normally functioning society, as a lack of capabilities of this person to fully participate in the normal livelihood of that society, as a deprivation from a normal standard of living of the people in that society, or as a lack of acceptable culture pertaining to that society. But one of the most powerful concepts of poverty is the lack of adequate income to acquire necessary food and non-food items for a normal living. Income is important because it reflects command over resources: it can be used as a means for a person to get what he is lacking.

But how inadequate? Many international organizations involved in international poverty comparison such as the World Bank used one US dollar a day in equivalent local currency as a minimum income to classify the poor from the non-poor. Although attempts have been made to make sure that the same purchasing power parity (PPP) is applied across countries, meaning that this one US dollar worth of income will buy the same commodity in all countries, differences across countries necessitate a need to have a country-specific poverty income that is relevant to the people in those countries, taking into account the structure of population, their living conditions in specific climate, their eating habits, the availability of food and other non-food items and their different prices, and so on. This is the main reason why many countries including Thailand try to establish their own country-specific poverty income.

How to Measure Poverty

In Thailand, poverty income has been established since the early 1970s. The approach used to establish this poverty income is called *Nutritional Adequacy Approach*. It starts from the establishment of nutritional requirements of the Thai people by different age and sex, which can be summed up in a single caloric intake for each individual. These minimum nutritional requirements are then set against the actual food consumption of the Thai people in different regions to see it they meet these minimum requirements. The prices of these foods are then used to convert the costs of these foods into monetary terms. What results is the minimum income that is needed to get these nutritionally adequate food items. This income is sometimes called food poverty line.

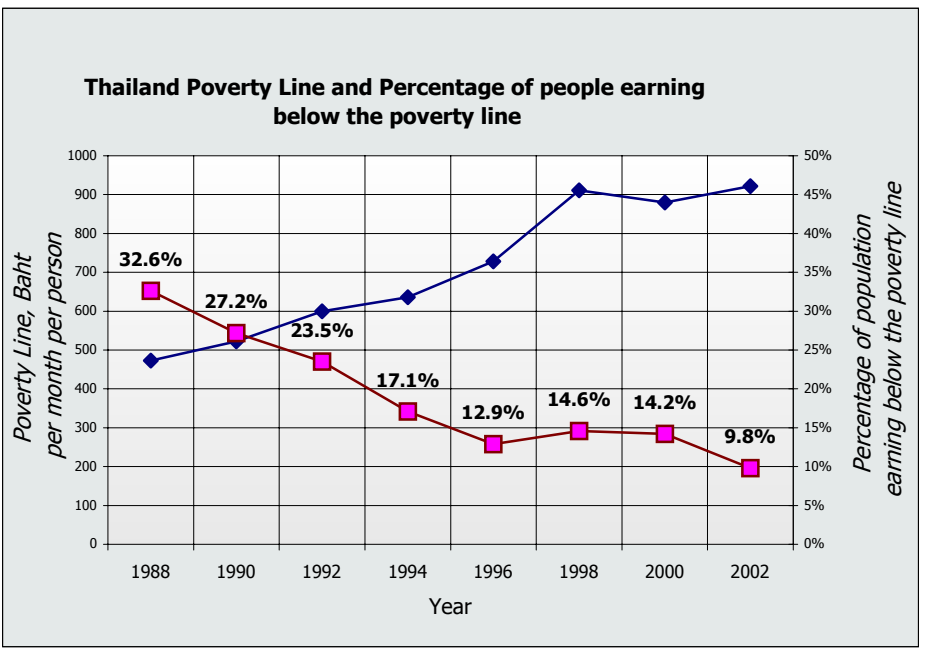
When the minimum income required to get non-food items is added to this food poverty line the final result is the total poverty line (or simply poverty line). We can compute the average poverty line for the whole population or population in different regions or locations, but as we have detailed survey data on household

income, we can actually compute poverty line that is specific to a particular family.

The National Statistical Office (NSO) has been conducting household income and expenditure surveys in Thailand since the early 1960s, and these surveys which are now known as the Socio-Economic Surveys (SES), are now conducted every two years for the whole country. Because this survey is conducted from randomly selecting households from different regions and locations proportional to their population sizes, these samples can be blown up to represent the total population by applying appropriate sample weights.

In short, we can line up everyone in Thailand from the poorest to the richest in a single file, then use our overall average poverty income or poverty line to cut the poor from the non-poor. If Q is the number of people below the poverty line, and N is the total number of population, then Q/N is the first measure of poverty that is most well known. This is often called a Head-Count Ratio (HCR), which shows the proportion of the total population who live below poverty line. Multiply this ratio by the total number of population will result in the total number of the poor in the country. The chart below shows the incidence of overall poverty in Thailand in various years.

Chart 1: Poverty Lines and Poverty Incidence in Thailand, 1988 to 2002.



Source: Computed from various Socio-Economic Surveys (SES)

Profiles and Causes of Poverty

The poverty line has enabled us to separate the poor from the non-poor so that we can study the socio-economic characteristics of each group to see the profiles of the poor and the non-poor, which may bring about further knowledge on what could be regarded as the correlates (if not the causes) of poverty in Thailand.

Poverty studies in the past several years have shown the following important correlates:

- The poor often have larger family size than average, and relatively large number of family members often have to be looked after by the head of the household.
- The head of this poor household normally has low education. The majority of these poor heads has only four years of education.
- They are also found to be mainly in the agricultural sector, working and living in villages. Many of these poor heads do not own land or have access to the use of land and work as wage laborers.
- The number of older heads of poor households has increased in recent years.
- It is often discovered that there are chronic illness and disability among members in the poor households.
- The poor often stay in one place, unlikely to move or migrate to other places.
- Different regions exhibit different characteristics and incidence of poverty. The Northeastern region is always the poorest region overall, followed by the North and the South. The Central region and Bangkok and vicinity are the better-off regions where the incidence of poverty is the lowest.

Strictly speaking, it is difficult to say that large family size with dependency level, low education of household heads, their health status, their choice of occupation in the agricultural sectors, the lack of land ownership, and so on, are the causes of poverty because the non-poors also exhibit such characteristics. The causation of poverty may go deeper than what we have seen from the above findings of poverty studies. Nevertheless, the above poverty correlates can give us some ideas on the policy responses to correct of reduce poverty problems.

Policy Responses to Poverty Problems

Discussion on policy responses to poverty problems in Thailand could be made easier by our first grouping the correlates or possible causes of poverty referred above into two categories: poverty on the demand side, and poverty on the supply side.

(a) Demand-Side Poverty

In this first category, poverty is associated with, or caused by, the demographic or socio-economic characteristics of the poor themselves. For example, they have low education, are in poor health, have large and dependent family, select or engage in occupation that yields insufficient returns, and so on. In this case, the principle of policy response in general would be to correct or improve these demographic and socio-economic conditions pertaining to the poor so that they are in a better position to get more or better income or returns from their stock of human capital.

(b) Supply-Side Poverty

Poverty can be caused, not by the lack of appropriate quality of human capital of the poor alone, but also by failures in the market systems as well as failures from government policies. The environment surrounding the poor can bring about supply-side poverty in the form of inadequate or low-quality productive inputs or their lack of access, distortion or discrimination in the markets against the poor, shortage or inefficiencies of public services to the poor, low returns for their production and services, and so on.

Under the framework of two groups of poverty mentioned above, policy responses can be designed to provide the two-pronged attack on the above poverty. Three general principles of poverty reduction can be considered, namely:

Principle 1: General Economic Growth and Macroeconomic Stability

General economic growth provides an excellent condition for the poor to increase their income generally through increased employment and higher returns to their productive services. But this growth must occur within a framework of macroeconomic stability with low inflation and stable domestic and external balances. Development in various economic sectors should also be balanced and well coordinated so that we do not have weak sectors that slow down other sectors, or strong sectors that could go astray if not properly monitored or regulated.

Principle 2: Specific Anti-Poverty Policies

While general growth can bring about higher income and reduce poverty, economic growth alone may not be sufficient. Specific anti-poverty policies targeted towards the poor themselves may be needed. These specific anti-poverty policies includes policies that raise the values of the stock of human capital such as more education, better skills, better health, and general increase in individual or personal human capacity, and also policies that provide better working conditions or environment favorable to the poor in their work or livelihood such as opportunities to increase productivity of their work, improvement in access to quality inputs, better marketing opportunities and better prices, improvement in delivery systems of government services, and so on.

Principle 3: Safety Net Programs for the Poor

When general economic growth and specific anti-poverty policies still fail to lift the poor from poverty, the society and economy must have in place a safety net program that provides temporary or short-term supports to the poor to enable them to cope with their short-term problems. Food, clothing, primary health, and shelter are some of the basic necessities that the poor in any society or economy must be provided either by the state, the private sector, or the civil society, or all of these.

ICT for Poverty Reduction Activities in Thailand

In the past decade, there are numerous development programs in Thailand with the poverty reduction objective. Some of them were successful, some were not. In this book, we provide some eighteen examples to the more recent, and active ones, specifically those related to the use and applications of Information and Communications Technologies (ICTs).

ICT activities can be grouped into three main categories: (i) information management, (ii) enhancement of access to information, knowledge and to the Internet, and (iii) Learning and Knowledge for self-sufficiency and sustainability. In each category, we provide sample cases as follows:

1. Information management

1.1 Thailand Integrated Water Resource Management Project

1.2 Agriculture Information Network Project

1.3 Plant Genetic Conservation Project Under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

1.4 Omkoi Integrated Development Project Under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

2. Access to information and Internet

2.1 SchoolNet Thailand

2.2 The Community Telecenter

2.3 Computer and Internet Learning Center at Nang Rong

2.4 Mobile IT Training

2.5 Development of Fundamental Software Packages for Thailand using Open Source

2.6 Computer Certification Project

2.7 Economy-Class PC (MY-Class PC)

2.8 Ultra Low-cost personal Computer (Computer ICT)

2.9 Wireless Local Loop for Rural Telephone

3. Learning and Knowledge for self-sufficiency and sustainability

3.1 IT for Inmates Under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

3.2 Automatic Web Translation Services

3.3 Distance Learning via Satellite

3.4 Constructionism Laboratory at Ban Samkha

3.5 Data Catalog for Community Products (www.siamvillage.net)

Mapping the Activities to the Principles

These projects may be classified under the principles cited above as follows, with the reference to section number of each project in this book:

	Information Management	Access to information	Learning and Knowledge
Principle 1: General Economic Growth and Macroeconomic Stability	[1.1] [1.2]	[2.5], [2.6] [2.7], [2.8]	[3.5]
Principle 2: Specific Anti-Poverty Policies	[1.3]	[2.1], [2.2] [2.3], [2.4] [2.9]	[3.3] [3.4]
Principle 3: Safety Net Programs for the Poor	[1.4]	[2.2], [2.3] [2.5]	[3.1]

1. Information Management

Introduction

Information systems can be used to enhance the way we manage resources that can affect the people at large. The *Integrated Water Resource Management Project* is an example where an information system helps integrating the data related to water levels, flows, floods, rains and tropical storms. With a better use of ICT, it is now possible to view the water status of water from sky to swamps. The information network can help many organizations, which are responsible to the regulation of water, to manage their parts better, and thereby lower the risk of flooding and droughts, which are the main cause of long-term poverty of many families.

Other aspects of information management include: the knowledge about agricultural suitability for land use and crop selection, potentially risk areas from flash floods, and landslides. The *Agriculture Information Network Project* illustrates the value of ICT to solve the primary problems of communities, and the empowerment of these communities to manage themselves better.

Preservation of plant genetic of Thailand is a long-term vision of Her Royal Highness Princess Maha Chakri Sirindhorn on sustainable development and biodiversity/natural resources preservation by the communities. By using a collaborative network of people and institutions, information related to biodiversities are collected and digested through school activities. The collected data not only help us tracking the rich species of plants and herbs in Thailand, but also give awareness to school kids about their valuable environment. Through the project, they learn about the risk of losing these valuable and irreplaceable natural resources. The project turned them into the knowledgable protectors and preservationists of environments and natural resources.

The fourth project in this chapter illustrates an *integrated approach to development* in a mountainous district of Omkoi in the province of Chaingmai. There are so many villages in this district where children are suffering from mal-nutrition, and lack of education: two most serious causes of poverty. The project keeps track of the individual development of children in each village so that appropriate aids can be sent into the site as well as giving the villagers ideas of sustainability through education, and self development. An experimental information system and GIS was developed to assist the management of this development project.

1.1 Thailand Integrated Water Resource Management Project

Project description

This project uses networked computers to collect information related to water resources in the lower part of the Chao Phraya River. It was then expanded to cover the area that includes almost the entire Chao Phraya Basin. The system is used for storage, studies, and analysis of data to be used in water resource management, parts of which have been in operation since 2002.

This project was initiated by the Office of the Royal Development Projects Board in 1998, in collaboration with the Suksapattana Foundation, and the Thailand Research Fund (TRF). The research and development work of the system is carried out by the High-Performance Computing R&D Division of NECTEC (under the National Science and Technology Development Agency), with cooperation from the Massachusetts Institute of Technology (MIT), Royal Irrigation Department, Electricity Generating Authority of Thailand (EGAT), Meteorological Department, Bangkok Metropolitan Authority (BMA), Department of Water Resources and Kasetsart University.

This is an important project because water is critical for the country's economic and social well-being. In the past, more than 30 organizations were responsible for the water resources management and the dispersion of information and responsibilities made it difficult to coordinate among the different organizations.

Methodology and process

Information from the five major organizations on water resource management in the Chao Phraya Basin is complied into a single data warehouse. The information is clarified and clustered together to show the overall picture of the water situation in the Chao Phraya River. The existing work process and standards in each organization have not been changed. A network of servers has been installed in these organizations to back up data to the main server. In addition, the data

from the main server is also backed up in each individual organization. Representatives from organizations have been invited to participate in the development of the system, in order to transfer the developed technology to each organization.

Data collected from these organizations are organized into a single website for ease of use in planning and operation.

Concepts related to poverty reduction

Poverty in Thailand stems from two important factors, namely, poverty resulting from disabilities and illnesses, and poverty resulting from natural disasters including flooding and droughts. Thailand currently faces more problems from flooding than droughts, with damages from flooding averaging over a quarter billion US dollars a year. Agricultural areas are worst hit. The incidences directly affect farmers who are already poor.

Thus, the development of a computerized information system on water resources, promoting the linkage of information, coordination and management of water resources previously scattered among various organizations, will improve management in terms of preventive measures and problem solving after the disaster occurs. The data can also be made publicly available or further developed to raise awareness among the people. Their participation in protecting, preserving and solving the problem is a mechanism in changing the present water resource management scenario to management by river-basin organizations in the future. Reducing the risks from floods and droughts directly minimizes the financial losses of the people.

In addition to finding effective ways of water resource management, the research and development of this system also aims for the sustained development of human resources and technology based on open source software and component-based cluster computing. The approach makes the upgrading of the present technology in the future more affordable.

Project objectives

1. To develop an information network to collect and compile data on water resources from five main organizations in the lower area of the Chao Phraya River. The aggregated data are distributed through a computer network for integrated water resource management coordination
2. To create a mathematical model to predict water conditions using data from the network. Organizations can use this information to plan their activities.
3. To replicate the original system for use in other river basins.

Expected outcome

A capability to address the overall problem of flooding and droughts in the Chao Phraya Basin. The basin covers more than half the area in the country and is a production base of more than 70% of GDP.

Technology Components

Data Warehouse, Web Server, WWW Technology, Internet GIS, Modeling, SVG. (All developed on Open Source platforms such as Linux and Postgres SQL)

Status

In operation

Executing Agency

National Electronics and Computer Technology Center (NECTEC), in collaboration with Office of the Royal Development Projects Board, Thailand Research Fund (TRF), Suksapattana Foundation, Chaipattana Foundation, Royal Irrigation Department, Electricity Generating Authority of Thailand (EGAT), Meteorological Department, Ministry of ICT, Bangkok Metropolitan Authority (BMA), Department of Water Resources and Kasetsart University

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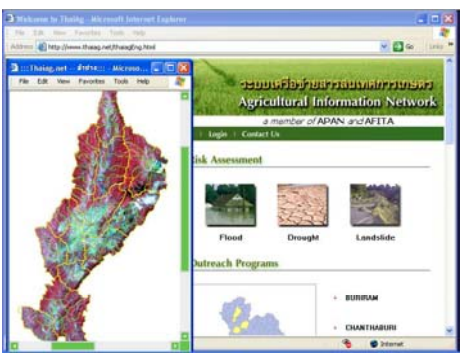
1.2 Agriculture Information Network Project (AIN)

Project description

This project aims to create a model of integrated agricultural information gathered by domestic and international organizations engaged in agricultural research in Thailand. The project will also develop a model to analyze agricultural areas at risk from floods, droughts, and landslides based on geographical information system (GIS). This data can be used to create agricultural development plans suitable to the localities and creation of truly sustainable occupation. Eventually, this project will establish a model for information utilization that will bring benefits to communities through joint learning process called "constructionism."



Methodology and process

The project will initially develop suitable information system as tools for using information to develop production, learning in agricultural management, and adapting the knowledge for community development as a whole. This system comprises of two main parts: the data catalog and agricultural metadata, and the Internet GIS for analysis of risky areas and agricultural information. The second phase of the project places an emphasis on building Information Brokers in the community. The last phase involves information diffusion to surrounding communities in order to build processes for thinking, acting and solving community problems by people in communities, using knowledge learned from accessible information technology.

Concepts related to poverty reduction

When we make relevant information available to the communities, they can use information as basis for thinking, analyzing, problem-solving. These can lead to the creation of a knowledge-based society for their occupational security, love of domicile, learning about beneficial and sustainable management of their resources. When communities have changed themselves to a self-reliance paradigm, they will earn more wealth. This is poverty reduction, and it is also a kind of "new economy".

Project objectives

1. Create data about areas at risk from flooding, drought, and landslides using geographical information system in the five pilot provinces: Lampang, Pitsanuloke, Kampaengpetch, Buriram, and Chantaburi
2. Create an agricultural data clearinghouse for data about 23 kinds of economic plants
3. Develop a model for a *Village that Learns*

Expected outcome

Farmers currently face poverty due to lack of knowledge, management, new agricultural planning, and solving problems arising from natural disasters. This agricultural information network can benefit farming communities in the following ways:

1. A data clearing house system that integrates information from public and private organizations.
2. Executive Internet GIS system that shows areas at risk from flooding, drought, and landslides. The initial project uses geographical information system in five provinces: Lampang, Pitsanuloke, Kampaengpetch, Buriram, and Chantaburi. The GIS can be used to manage areas at the community level.
3. A system of image recording and image information management.

4. Building a learning society in applying knowledge in managing the risk of an area and production in Ban Samkha, Maetha District, Lampang Province and Baan Kruat District, Buriram Province.

Technology Components

Agriculture data clearing house for economic plants; Executive Internet GIS system of areas at risk from flooding, drought, and landslides; Image Clearing House system

Status

In operation

Executing Agency

National Electronics and Computer Technology Center (NECTEC),
with support from the Ministry of Agriculture and Cooperatives

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1.3 Plant Genetic Conservation Project Under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

Project description

Thailand is a country with biodiversity richness. It is important to preserve and protect this biodiversity of the country for a long-term economic and social stability. The project creates activities to develop an appreciation for and an awareness of natural resource preservation amongst the youth, community and organizations concerned. ICT helps creating a workable collaborative system to share important data about natural resources and publicizing the aggregated information on the internet.

Methodology and process

- Create a cooperative network to preserve the natural resources in the country, participatory learning, and systematic use of resources.

- Education of school children to learn about their environment scientifically: by observation, note taking and consultation with references, which include senior people. The School Herbarium Project, involving more than 400 schools nationwide, lays the foundation of developing an appreciation for preservation and deriving beneficial uses from local plants among youths. These ideas will be adapted to benefit the community to preserve the country's biodiversity and develop the systematic use of natural resources.

Concepts related to poverty reduction

The Plant Genetic Conservation Project Under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn aims to protect the genetic diversity of plants, animals, and natural resources. These valuable natural resources are the equivalent of capital that can be used for sustainable development in society.

Project objectives

1. To preserve genetic diversity of plants in Thailand through the development of a database to store dry plant strains and domestic plant strains.
2. To serve as a source of information on herbariums
3. To create a collective will to preserve the genetic diversity of plants in Thai society.
4. To provide children and youths with the opportunity to participate in creating the school's herbarium.

Expected outcome

1. Awareness and will to preserve the diversity of the country's valuable natural resources among school children and youth.
2. Integrated database on plant genetics.

Technology Components

Open Source: Postgres, Java, PHP, VB; Internet GIS system

Status

In operation

Executing Agency

Plant Genetic Conservation Project Under The Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

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1.4 Omkoi District Integrated Development Project Project Under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

Project description

This project is an information system to track and evaluate results of development activities in Omkoi, a district in Chiang Mai.

Omkoi District is adjacent to Tak and Mae Hong Son provinces. Transportation is not very convenient and Omkoi is isolated in a mountainous area at the mouth of the river. The inhabitants of Omkoi are scattered throughout the area and they are uneducated. They face health problems among mothers and children who lack proper nourishment, protein, iodine, and Vitamin A.

Her Royal Highness Princess Maha Chakri Sirindhorn established community centers and provided assistance through the Children Development Fund under her patronage. As directed by the princess, the activities and outcomes of the assistance, especially those related to the health of mothers and children, in Omkoi were tracked and recorded in detail at the household level. The implementation of projects, which is under the responsibility of the Personal Affairs Division and local authorities in Omkoi, requires the use of Geographical Information System (GIS) to collect, record, track and report data.

This project has collected data at the household level. Such data were analyzed, integrated and displayed on GIS. Furthermore, a map (in the scale of 1:50,000) and satellite images, will be produced for use by field workers as well as by local people to track the development outcomes.

Methodology and process

Use satellite pictures and GIS data to make a general assessment of potential of the area in terms of existing natural resources. The system is Internet-based for ease of data entry and access. The system was installed and tested at the district level. For the Educational Center for Hillside Community, the paper version of maps have been prepared for ease of use in the locality.

Concepts related to poverty reduction

Omkoi District is relatively well endowed in natural resources, not heavily populated. Mothers and children typically lack proper nourishment, and this leads to a lack of education, employment and increased poverty. It is believed that proper nourishment and education for the mother and child should reduce poverty in the long run. Therefore, the availability of widespread access to education and healthcare, as well as mechanisms to coordinate, track, and report on activities at the household level and should improve the effectiveness of development.

Project objectives

To develop an information and communication system to track, evaluate, report and analyze projects in Omkoi District, and to coordinate with people concerned in the local area and the Personal Affairs Office of Her Royal Highness Princess Maha Chakri Sirindhorn.

Expected outcome

Establish a good tracking and evaluating system to improve the health of the mother and child. As a result, the child will be better educated and attain necessary skills to enhance job opportunity. Furthermore, they will be more conscious and aware of the preservation of natural environment and local resources.

Technology Components

Information system in the area reaching the household level using Internet GIS
Internet GIS of the area, including satellite pictures.
All these systems are developed on the Open Source platforms.

Status

In progress

Executing Agency

Personal Affairs Division of Her Royal Highness Princess Maha Chakri Sirindhorn, and National Electronics and Computer Technology Center.

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2. Access to Information and Internet

Introduction

The access to information and Internet in Thailand has improved dramatically in the past four years. Internet users increased four-folds from 1.5 million people in 1999 to over six million people in 2003 [reference 1]. This is due to many activities and projects, which were parts of the government policy to bridge the digital divide within the country. The most visible project that boost the access to information is the *SchoolNet Thailand* project, which enabled 5,000 schools to be online with the Internet [references 2-6].

For the rural areas, there are several *community telecenter* projects, which are the places where public-access equipment and devices are made available to the communities on shared basis. In addition, due to the strength of budhist monks and temples, some of these "telecenters" have been made available at temples and, in one case, as *mobile IT training units*.

The promotion of information access and the Internet was further accelerated by the public-private-partnership in 2001 to deliver low-cost PCs to everyone. With the cooperation between National Electronics and Computer Technology Center (NECTEC) and the computer manufacturers in Thailand, a first version of *"Economy Class PC"* was introduced. The project helped Thai people to obtain low-price PC together with a proper payment of value-added tax and use of legal software packages. All PCs sold in the project were those models, which have passed the "computer certification" tests, and therefore the risk of under-performance and sub-standard machines can be minimized.

In 2003, the Ministry of ICT initiated a more aggressive project called the *"Computer ICT for Thai Citizens"* at an ultra low-price. The project attracted more than 150,000 buyers and a key to the success of the project was the availability of the *Open Source Software* development in Thailand.

2.1 SchoolNet Thailand

Project description

This is a pilot infrastructure project to link 5,000 schools nationwide to the Internet. The aim is to use ICTs to improve the quality of education for Thai youths and to reduce the gap in opportunity to access good education between urban and rural areas. The network also serves as a communication tool for the

exchange of information between schools, teachers, teachers and students and among students themselves.

Methodology and process

Development of SchoolNet takes place in four stages:

Evolution Stage (1995-1997): the National Electronics and Computer Technology Center initiated the SchoolNet project as guided by the national IT policy (IT 2000). It set a target of 50 participating schools nationwide. The biggest obstacle found was the disparity in access charges between schools in the urban and rural areas and the availability of local contents in Thai.

Development Stage (1998-2000): Her Royal Highness Princess Maha Chakri Sirindhorn graciously permitted the use of the Kanchanapisek network, which has service centers nationwide supported by the Telephone Organization of Thailand and the Communications Authority of Thailand. This resulted in schoolnet@1509 that allows 1,500 secondary schools nationwide to connect to the network at a cost of 3 Baht (USD 0.08) per call. A parallel program to encourage the development of Thai content on the Internet was also initiated.

Expansion Stage (2001-2002): The Cabinet approved the expansion of the network, to include primary schools, secondary schools, and vocational schools for a total of 5,000 schools nationwide.

Production Stage (2003 onwards): Transfer the pilot project to the Ministry of Education, which will be responsible in the scaling of project to cover all schools (approximately 34,000) nationwide.

Human Development Report 2001, p.87

"Thailand has developed the first nation-wide, free-access network for education in South-East Asia, SchoolNet-1509. With only 120 dial-in telephone lines, the network was obliged to establish a system to optimize the use of the lines: it gave each school one account for Web browsing and no more than two for Web development, limiting total access to 40 hours a month. It also created a Website to increase schools's awareness of the network and make Thai content available on the Internet."

Note: the original 120 phone lines in 1998 were supplanted with additional 400 lines all over the country. In 2000, the network was expanded to more than 1,600 lines to cater for 5,000 schools.

Concepts related to poverty reduction

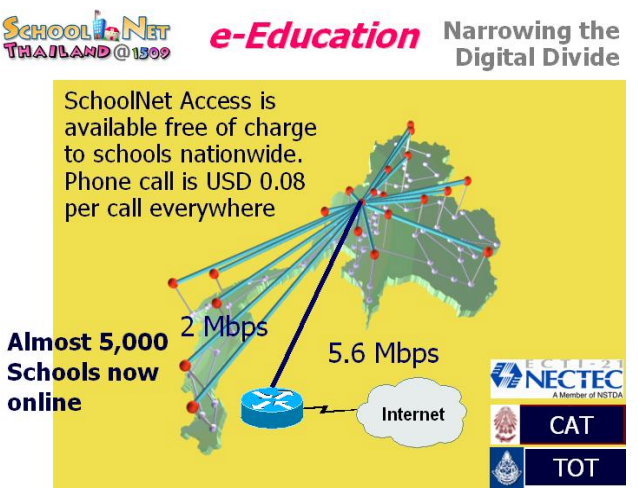
Prepare Thai youths for knowledge economy that makes use of the Internet as an information source and as a powerful collaboration tool. They will learn how to look for information on their own and learn how to make use of it in their job search, and their career.

Project objectives

1. To enable schools, teachers and students to benefit from the ICT (Internet) in learning.
2. To allow teachers and students from the same and different educational institution all over the world to communicate with one another to exchange information and engage in collaborative activities.
3. To promote educational activities on the Internet.
4. To expand network connectivities to schools nationwide and to improve the quality of education in the future.
5. To serve as a mechanism to reflect the education reform, to accord with the National Education Act B.E. 2542 Section 9 on "Technology for Education".

Expected outcome

1. Ensure equal educational opportunities by providing access to the internet for approximately 5,000 primary, secondary and vocational schools nationwide.
2. Having available local contents on the Internet for teachers and students to use.
3. Allow teachers and students from different schools in Thailand and overseas to communicate and collaborate with one another on the Internet.
4. Create interest in technology among teachers and students so they can use it to develop their own skills. Teachers and students will also be made aware of the importance and benefits of the Internet, which will facilitate the expansion of the project beyond the pilot project state.



Technology Components

1. The SchoolNet@1509 network provides a dial-up Internet access network to schools nationwide. A small number of leading schools are connected using leased line connection.
2. The Thai version of the Linux School Internet Server (Linux-SIS) includes the necessary software to operate a server such as web server, mail server proxy/cache server and DNS server that can be installed in PCs. A Thai-language web-admin tool is also available to maintain the server without a high level knowledge of Linux. [See Reference 4]
3. The Digital Library developed by NECTEC can be used as a model to develop the school's library. The digital library is an interactive learning medium for teachers and students nationwide and encourages schools to link their school website with other schools in the country using the SchoolNet Network.

Status

This project has accomplished its objectives and is ready to be transferred to the Ministry of Education to implement in schools nationwide.

Executing Agency

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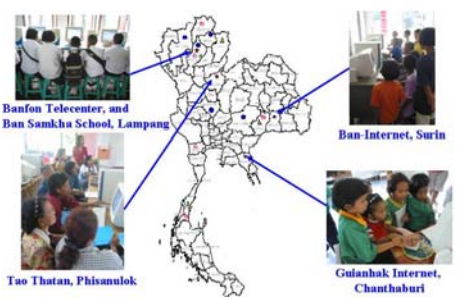
Ms. Yaowalak Khonklong (yaowalak.khonklong@nectec.or.th)

2.2 The Community Telecenter

Project description

This project aims to apply ICT in promoting Thai indigenous knowledge, which is the country's social capital, to link the community's economy with the international economy. It also seeks to build cooperation between the community, the government sector, and the private sector in the locality to combine indigenous knowledge and use ICT to maximize benefits to the



community. In addition, this project attempts to find a suitable operating procedure for the information and communication community center or "telecenter", which will serve as a model for other centers to be established in the future.

Methodology and process

Select four close-knit communities that produce a unique local product to participate in the community telecenter pilot project. The community will learn how to use and benefit from ICT. In addition, they are encouraged to work with other agencies The community and agencies concerned in order to achieve a sustainable management of the telecenter by the community, as well as sustainable development of the community.

Concepts related to poverty reduction

The community telecenter enables the community to benefit from ICT by developing the community's potential to increase their income from the production of local products and tourism. Using the internet, the community can publicize their products, indigenous knowledge, history, arts and culture, local traditions, and tourist attractions to a wider audiences, both Thais and foreigners. This will help increase their income and channel technology to the grassroots level, which will then lead to further learning and initiation of new activities, thereby, forming the basis for the community to use technology for a sustainable economy.

Project objectives

1. To establish four pilot community telecenters which serves as a platform to build and exchange of news, knowledge and information between the community and the outside world.
2. To create opportunities for the community to benefit from using ICT to increase revenue generated by the community products and tourism.
3. To promote the use of ICT in a beneficial manner suited to the needs of each community.
4. To study and identify a management system/mechanism which is suitable for each community telecenter.
5. To lay the foundation in the community regarding the use of ICT to build a sustainable economy for the community.

Expected outcome

1. Distribution of knowledge and opportunity for villagers which, consequently, will lead to the creation of a wealth of local knowledge
2. Communities can use the Internet to publish information about their products, local wisdom, history, art and culture, local tradition, tourist attractions for a wider audiences, both Thais and foreigners.
3. Establish and develop a process based on the creative use of existing cultural capital in the society to further strengthen and sustain growth.

Technology Components

Basic computer systems, Internet access via modem, running a website, use of Open source software

Status

In progress. All telecenters are now managed by the community.

Executing Agency

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2.3 Computer and Internet Learning Center at Nangrong

Project description

This project aims to develop an Internet learning center in Nangrong District, Buriram Province. The project site is a house owned by one of local villagers, Mrs Sanit Tipnangrong (*Na Noi*). The learning center serves as a place where the community can learn about technology and apply it in their daily lives. It is also a source of information that can be used to develop the community.

This project is supported by: the Suksapattana Foundation, Thaicom Foundation, and the Department of Non-formal Education, Ministry of Education.

Methodology and process

1. People in the community engage in the learning process whereby they learn from past experiences of his/her own, as well as experiences of others by note taking and/or recording of relevant information. Through this process, they would be actively involved in "knowledge creation".
2. People in the community learn accounting skills and how to manage income and expenses, which will help increase income and reduce debt from unnecessary expenses.
3. People in the community learn computer skills and how to use suitable application software, which will help increase the efficiency and accuracy of accounting records.
4. Make necessary information accessible to the community in order to strengthen them and make them self-sufficient by designing an accounting system for community cooperatives.

Concepts related to poverty reduction

It is believed that poverty in the community results from a lack of knowledge and understanding of financial management. A simple spreadsheet program can help teaching simple accounting to villagers. Access to information on community's income and expenses, in turn, can help increase the community's skills in effective financial management. In addition, the community can use this information to generate additional income for themselves.

Project objectives

1. To increase management skills for community leaders.
2. To increase access to technology in remote areas.
3. To create knowledge that will strengthen the community's potential and increase their income.
4. To create a development process based on the basis of utilizing existing cultural resources, and adding values to strengthen its growth and development.

Expected outcome

The community can apply this knowledge to solve their financial problems and community members can learn from one another's experiences. The interaction and shared experiences create a sense of unity, which allows them to be independent and self-sustained.

Results show that *Na Noi* has acquired accounting skills and she can track her sources of income and expenses incurred. She is able to identify areas she can economize, the cause of her financial problems, how she can minimize her debts and pay-off her loans. *Na Noi* advises interested families on how they can manage their finances, which helps them improve their household accounting systems and also reduce their debt. The community recognized the importance of good accounting skills, thus, they created an accounting system for the community cooperative.

Technology Components

Personal Computer, Internet, spreadsheet software, accounting

Status

In progress. The site is managed by the community.

Executing Agency

Suksapatana Foundation/Thaicom Foundation

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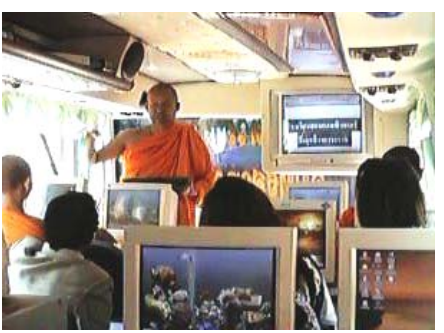
Mrs Sanit Tipnangrong (*Na Noi*), (tipnangrong@hotmail.com)

2.4 Mobile IT Training

Project description

The Mobile IT Training Project, proposed by Venerable *Sakommunni Bhikkhu* (Abbot of *Suddhivatavararam Temple*) Tachalom Subdistrict, Muang District, Samut Sakon Province, aims to provide needy local schools access to ICTs. Two buses have been equipped with 20 computers each and other necessary equipment to travel to schools in Samut Sakon province that lack computer equipment and teacher. Various computer classes are provided by the monks from Suddhivatavararam Temple.



Methodology and process

1. Raise funds from local philanthropists and businesses to

purchase computer equipment and two buses, and have those equipment installed (40 computer sets, 2 television sets, to be used as teaching media)

2. Prepare a curriculum (by monks at Suddhivatavararam Temple who have computer knowledge).
3. Provide computer classes for schools that lack equipment, with monks as teachers.

Concepts related to poverty reduction

The project provides training for youths with the aim to provide them with basic computer knowledge and skills, so that they can apply in daily life and job. Thus it helps to increase their income and that of the family. In addition, it is hoped that the youths will use their free time productively and stay away from drugs which destroys the quality of life and the community's economy.

Project objectives

1. To enable schools that lack computer and teachers to keep up with technology.
2. To let society aware of the monks' value and appreciate the Buddhist religion.
3. To offer an alternative in the fight against drugs by allowing youths to use their time productively.

Expected outcome

1. Enhance computer knowledge and skills for teachers and students in schools that lack computer.
2. Society will appreciate the role of religion in benefiting society.
3. Reduce the incidents of drug addicts in youths by offering them alternatives to spend their free time in a more productive way that not only benefiting themselves, but also society and nation.

Technology Components

Computer, Internet, Wireless Keyboard.

Status

In progress

Executing Agency

Venerable Sakommunni Bhikkhu (Abbot of Suddhivatavararam Temple)

Contact address

Venerable Sakommunni Bhikkhu (Abbot of Suddhivatavararam Temple)

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2.5 Development of Fundamental Software Packages for Thailand using Open Source

Project description

High price of software poses an obstacle to the efforts of developing countries, lacking both financial and human resources, to use ICT for development. Consequently, people in developing countries use pirated software in violation of intellectual property rights. Thus, one measure to bridge the digital divide in the rightful way is to make quality legal software more widely available and affordable to the public.

Operating System (OS) and Office Suite are two basic software packages used in computers. Open Source software is licensed software that can be freely used for research purposes, distributed or modified. By providing the source code, the human-readable instructions to the computer, open to everyone, it provides the opportunity for others interested to learn about the technology behind the software or use it for other purposes. Therefore, this project aims to develop the OS and Office Suite that uses open source technology.

Methodology and process

Since 1995 NECTEC has studied and developed software using open source OS to be used in schools that are members of SchoolNet. The product is called (i) Linux SIS (School Internet Server) package which is used as an OS for the main internet server in schools [see reference 4], and (ii) Linux TLE (Thai Language Extension) and Office TLE , which are used in desktop PCs. These software are easy to use and their quality are comparable to the more expensive commercial ones. Furthermore, the use of these open source software can not only reduce number and value of imported software, but also can help develop a large number of Thai experts in software development.

Concepts related to poverty reduction

From the view of developing countries, commercial software are unaffordable for a large number of users. A more practical alternative, with lower prices, is sought for. Open source software offers new alternative that can help reduce problems such as high price, technological monopoly, and copyright violations. It will lead to a more self-sustaining development, help creating jobs and generating income to local software companies.

Project objectives

1. **Software** – develop open source software, as well as provide necessary support for Thai society.
2. **Awareness/publicity** – promote awareness on software copyright and the use of open source software by publicizing and providing relevant information.
3. **Human resource** – develop human resources and capability to use open source software.
4. **Business/software companies** – promote supporting industries.

Expected outcome

1. A comprehensive version of Open Source software Linux operating system will be preloaded in at least 15% of local brand computers.
2. Creation of supporting industries related to Open Source software such as training programs and production of manuals.
3. Educational institutions will offer courses related to Open Source software.

Technology Components

Thai web-based System Administration Tool software allowing users to quickly study and operate the system from distant locations; Thai Language Standards,; Thai software for Linux (Thai Language Extension) – Thai Locale for UNIX; Thai language processing software; RedHat Linux; OpenOffice; Thai fonts (from the National Font Project).

Status

In operation. More than 100,000 sets have been distributed.

Executing Agency

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2.6 Computer Certification Project

Project description

The Computer Certification Project was established in 1998 to promote trust and confidence in using local-brand PCs by means of product testing and certification. At the same time, the consumers are protected from purchasing low-quality products.

Methodology and process

1. Evaluating certification system (ISO 9000 or Thai Foundation Quality System (TFQS))
2. Issuing minimum requirements of each class of computer certification (update every 3 months)
3. Performing lab tests of computers according to set guidelines
4. Issuing certificates
5. Random testing of computers that have been certified

Concepts related to poverty reduction

1. Promote the quality of domestically produced computers comparable to that of computers produced overseas (promote SMEs).
2. Build consumer confidence in computers produced domestically
3. Increase knowledge in purchasing quality computers at affordable prices in order to reduce the total cost of ownership to the comsumer.

Project objectives

1. Develop the quality system for computers manufactured and sold in Thailand.
2. Provide information to the general public on how to buy low-cost, quality computers.

Expected outcome

1. A quality assurance system that helps the consumers to purchase quality computers in Thailand.
2. A matured computer manufacturing industry.
3. A widespread use of computers and increase in number of people with ICT knowledge.

Technology Components

EMI/EMC testing, quality assurance

Status

In operation

Executing Agency

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Mr. Ahtniti Asavinnimitkul (ahtaniti.asavinnimitkul@nectec.or.th)

2.7 Economy-Class PC (MY-Class PC)

Project description

This project seeks to enable consumers use desktop computers that are reasonably priced and of suitable quality. In 2001, NECTEC created a cluster of computer manufacturing companies who are participating in *NECTEC Quality PC Certification Project* to produce a popular PC model which would cost less than 20,000 Baht or approximately US$ 500 (price inclusive of CRT Monitor and VAT). This is to promote the widespread use of ICT which will help increase the opportunity to further develop the country's pool of knowledge, education, economy, and society. The project is private-sector led, with government agencies providing market stimulation and quality system support.

Methodology and process

1. Computer assemblers collectively negotiate prices with producers and distributors of computer parts
2. Arrange for NECTEC to test and certify computers produced by companies participating in the project. NECTEC will then place a special label certifying the quality of the product on every computer.

Concepts related to poverty reduction

1. Reducing the price of computers will make them more available to consumers, thus enabling them to use ICT for educational purposes and work. Computer skills will also lead to opportunities to develop skills, work and higher incomes.
2. Expansion of the local IT markets.

Project objectives

1. To increase opportunities to use ICT among the general public which will affect the development of skills in using ICT to develop the country.
2. To strengthen the PC industry in terms of price and quality.

Achieved outcome (2001-2002)

1. Production and sales of companies participating in the project increased by 10-15%, with the market share of domestic computer producers increased from 60% to 70-75%.
2. The price of computers in Thailand dropped by approximately 20-30% between 1999-2000.
3. Domestic businesses established an organization called "The Association of Thai Computer Manufacturing" (ATCM).

Technology Components

PC Testing, Quality System, Electromagnetic interference (EMI), Electromagnetic Compatibility (EMC), Product Safety.

Status

Completed. This project is a precursor for the "Computer ICT" project.

Executing Agency

National Electronics and Computer Technology Center (NECTEC),
The Association of Thai Computer Manufacturing (ATCM)

Contact address

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Mr. Ahtanitti Asavinnimitkul (ahtaniti.asavinnimitkul@nectec.or.th)

2.8 Ultra Low-cost Personal Computer (Computer ICT)

Project description

This project aims to reduce the digital divide by increasing the number of computer users with ultra low-price PCs (around US$260). The PC specifications are for general use for the office, home and school, with Internet access and multimedia capability.

Methodology and process

1. The Ministry of ICT managed the project and handle the public relations.
2. CAT Telecom Public Company Limited took orders for the ICT computers and provide after-sales services.
3. NECTEC certified the quality of computer products.
4. The Government Savings Bank and Krung Thai Bank provided loans to buyers.
5. The member companies of the Association of Thai Computer Manufacturing assembled and delivered the computers.

Concepts related to poverty reduction

1. Increase opportunity and the number of computer users in the country.
2. Promote and encourage people to increase their usage of ICT.
3. Increase opportunities to learn about ICT which will be an important foundation for human resource development.

Project objectives

1. To increase in the number of new computer users.
2. To lower market prices of computers by 20-30% from 2002 prices, by means of free-market competition.
3. More people have access to ICT and can benefit from it.

Expected outcome

More than 160,000 computers have been ordered and delivered.

Technology Components

Linux, Open Source software, Thai Language Extension to Linux

Status

In operation

Executing Agency

Ministry of Information and Communication Technology,
Association of Thai Computer Manufacturing (ATCM),
Association of Thai Computer Industries (ATCI), NECTEC, Vendors

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2.9 Wireless Local Loop for Rural Telephone

Project description

Installing a telephone system in remote rural areas generally requires high investment and a lot of time for installation. In addition, the income from each subscriber or public phones would be lower than the business subscribers. Thus, telephone service providers are unwilling to invest in installing telephones in unprofitable rural areas. This leads to a scarcity problem and contributing to the digital divide.

This project is a deployment of Wireless Local Loop, or WLL, technology for installing a telephone system without using copper wires. WLL requires less installation time and is a cheaper than hanging the copper wire on poles.

Methodology and process

Coordinate with TOT Corporation Public Company Limited to test the Wireless Local Loop in providing telephone and Internet services for two schools in rural areas, two tambon administration organizations and households in two villages. Data will be collected on the quality and cost of providing Wireless Local Loop services. If the results are

satisfactory, then this system will be expanded for uses in rural areas nationwide.

Concepts related to poverty reduction

The WLL technology helps quick installation of telephone and Internet access to the community. By cooperating with the community center, plain old telephone service as well as the Internet are made available to the community.

In the pilot site of Ban Samkha School, the school provides training for villagers to learn how to benefit from information and knowledge which they access from the computers. By applying the knowledge in arithmetic, accounting, language, and information search, the villagers can cut down their debts and increase their income through better management, better selling price, and thereby lifting the level of quality of life and reducing poverty in the villages.

Project objectives

Replace the copper wire system with Wireless Local Loop technology in installing telephone lines for remote villages. As WLL technology requires less investment and time for installation than the copper wire system, the telephone company can afford the investment for telephone lines to meet much-needed shortage of service in rural areas. It is one method of solving a problem of digital divide.

Expected outcome

Villagers will have a better level of quality of life, by having better opportunity to access to information and knowledge from various sources.

Technology Components

Wireless Communication Technologies.

Status

Development in progress.

Executing Agency

Telecommunication and Network Research and Development Division, NECTEC

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3. Learning and Knowledge for self-sufficiency and sustainability

Introduction

Information and knowledge are keys to development in the knowledge-based society. Therefore, to make the environment suitable for life-long learning and ensuring the best use of information as resource for knowledge creation is crucial. Furthermore, to this end, special needs and requirements of everyone in the society, regardless of socio-economic background, geographical location, or physical condition, must be taken into account.

This chapter presents several programs that have been initiated, some by the government, and some by the non-government organization, some with public-private partnership, to empower people by engaging them in learning and knowledge creation, sharing, and use, with the goal to achieve self-sufficiency and sustainable development. Examples are presented below:

IT for Inmates Under the Initiatives of Her Royal Highness Princess Maha Chakri Sirindhorn, which is a pilot project initiated with the aim to provide IT knowledge and skills to those misconducts who were being imprisoned, so that they have a greater opportunity to find suitable job once they completed their sentence, and thereby, can earn their living. [See reference 7.]

Automatic Web Translation Services, a project which started as a research and development project on language translation technology, aiming to bridge the information and knowledge divide resulting from language barrier. Once the development was completed, the automatic translation service was made available on the Internet for the public to use in the year 2000.

Distance Learning via Satellite, a project initiated and implemented by the non-government organization in accordance with His Majesty the King's vision and guidance, to provide a wider opportunity for those who previously had limitation, both in getting general education and life-long learning. This project has made favorable progress and presently, it also broadcasts the educational programs on several cable TV channels for viewers nationwide.

The last two projects presented in this chapter are those with main objectives to empower people in rural communities, by providing them access to proper information and knowledge as well as enhancing their capabilities to create and share their knowledge with others. Furthermore, they are trained how to use information and knowledge to generate more income from the production and sale of their local products. All these concepts are well illustrated in the projects *Samkha Constructionism Lab, and Data Catalog for Community Products.* The former is an initiative of a non-government organization, with partnership from the government, i.e., the Ministry of Education. Through the course of this

project, which has been implemented for about four years, the people in Samkha village now can serve as a model community that can make the best use of information and knowledge for the community's well being.

The latter, i.e., *the Data Catalog for Community Products,* is a government-initiated project to develop an information system of community products which allows for better management of both raw materials and finished goods. People in the community are trained to make use of such information system so that they are more knowledgeable about the total value chain of production and consequently, are able to plan their production and sale of their products to achieve better productivity and higher revenue.

3.1 IT for Inmates Under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn

Project description


outlook

We care

Royal helping hand

Info for donations:

The IT for Inmates Under the Initiatives of Her Royal Highness Princess Maha Chakri Sirindhorn Project was started in three correctional facilities in Bangkok. Her Royal Highness Princess Maha Chakri Sirindhorn donated 20 computers and two printers to the women corrections facility, in 1997, to be used in teaching computer skills to inmates. Inmates are given the opportunity to learn about modern technology and acquire skills in demand by the labour market that they can use when they complete their sentence. Many inmates expressed interest and participated in the program. The project was then expanded to two other corrections facilities in 1998 and 2000, respectively. Based on the success of the initial program, Her Royal Highness Maha Chakri Sirindhorn donated another set of 20 computers and two printers to each facility. [See reference 7.]

In addition to providing computer training courses for inmates, inmates who complete the course in these three corrections facilities are encouraged to work on some out-sourcing jobs such as typing documents and graphic design work, which will give them the opportunity to use their newly acquired skills and provides them with an additional source of income during their imprisonment. The outsourcing is provided by both in-house (i.e., the correction facility and/or Department of Corrections), and other agencies.

With the skills and work experience acquired while serving their sentence, many former inmates have successfully found computer related jobs and earn sufficient income to support their family. Their lives and standards of living have changed for the better. This reflects the project's success and the immeasurable benevolence of Her Royal Highness Princess Maha Chakri Sirindhorn in providing the opportunity and a new life for these individuals.

Methodology and process

First implemented in Bangkok Female Central Corrections Center in 1997 and later expanded to Institution of Drug Addicts and Bangkok Remand Prison in 1999 and 2000, respectively. Computers and printers are installed in each correctional facility (first start with used machines and a request for upgrade will be considered when the inmates show progress/good results). The curriculum used was from the Non-formal education program, Ministry of Education.

Concepts related to poverty reduction

Providing the inmates with necessary skills and knowledge to find a job after complete of sentence can increase their opportunities to sustain a living. This is an additional source of income for them and their families and thus help reduces poverty.

Project objectives

Provide inmates with computer training during their imprisonment, which they can use to sustain a living when they complete their sentence and become law-abiding citizens.

Expected outcome

Inmates will have computer knowledge and skills, which will help them find a job to support themselves and their families when they complete their sentence. These individuals can use their computer skills to find a job to support their family and do not have to return to a life in prison.

Technology Components

Basic Computer Literacy, Graphics Design

Status

In progress.

Executing Agency

Department of Corrections, Ministry of Justice,
National Electronics and Computer Technology Center (as the secretariat to Her Royal Highness Princess Maha Chakri Sirindhorn's IT Project).

Contact address

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3.2 Automatic Web Translation Services

Project description

The expansion and widespread use of the Internet has facilitated and expedited the exchange of information. In addition, information is available on the internet in many languages. According to Global Online Marketing Resources (Source: http://www.glreach.com), the top five most widely used languages on the internet are English (35.7%), Chinese (11.9%), Japanese (10.8%), Spanish (8.1%), and German (6.5%), respectively.

English is the most widely used language, thus, poses a major problem for Thai Internet users, especially those who are not proficient in foreign languages. Thus, tools that can help reduce language barriers such as an automatic language translation system and electronic dictionaries are very important in helping to bridge the digital divide resulting from users' inability to comprehend the contents that are available on the internet.

Methodology and process

1. Joint research with NEC Japan to develop a translation engine
2. Develop and improve grammar rules to make it complementary with the Thai language
3. Collect and create a dictionary to use in translation
4. Create a Server system to provide web-based services
5. Examine and maintain the system

Concepts related to poverty reduction

Knowledge plays an important role in poverty reduction. An English/Thai

translation system is a medium that can help bridge the gap of access to information on the Internet. The English-to-Thai and Thai-to-English translation system will help facilitate the transfer of technological information and developments and the transmission of news from Thailand to other countries. At the same time, it can also relay information concerning technological improvements, including equipment and methodology, originating overseas that is useful or is potentially useful in Thailand thereby contributing to the development of the country's economy.

Web-translation by ParSit, showing the APEC2003 Website in Thai Language

Even though it is possible to access information from all over the world, limited knowledge of foreign languages, especially English, prevents Thais from fully benefiting from such information. Information can reach a wider audience and increase its value if written and audio information available in English can be quickly and efficiently translated into Thai. At the same time, the world community can also learn more about Thailand and have a more positive attitude towards the country and her people if Thais can provide information and make their thoughts and opinions known to people who cannot read Thai. Thai people will also recognize the value of cultural preservation.

Project objectives

1. Facilitate the exchange of information between Thais and the international community by bridging the gap resulting from language barriers.
2. Collect data on research in the field.

Expected outcome

Language translation technology requires knowledge of computers as well as languages. Countries all over the world are studying language translation

technology and international meetings are regularly held to exchange information and experiences. This project not only benefits academics in Thailand, but these translation services can be used with other languages similar to the Thai language. NECTEC has collected data on translation services jointly developed with Japan, electronic dictionary for the translation system, Thai grammar rules, and a language database. This information will be important in improving language translation system in the future. A Thai-English translation system is currently being developed. Once completed, two-way translation will be possible and the engine of Thai-to-English and English-to-Thai translation system can be used to develop Multilingual Information Retrieval/Extraction/Summarization in the future.

Technology Components

The study of a language translation system in Thailand began in 1981 with the Ariane Project supported by the French government. This project increased knowledge of language translation systems.

In 1986 NECTEC agreed to develop language translation system with the Center of International Cooperation of Computerization (CICC). This project served as a lab model and provided information on studies related to language translation machines.

The "Parsit", a language translation system, supported by NEC Japan, seeks to use the results and accumulated knowledge to develop a system for general use. "Pasit" is a "quick-look" translation system based on rule-based machine translation (MT) that does not rely on languages as the medium in translation.

The translation process occurs in two steps as follows: 1) analysis from the source language to a format that is not language based and 2) transforming it into the target language.

Status

Completed. The service is available at www.suparsit.com. Further development is still ongoing in order to improve the effectiveness of translation.

Executing Agency

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3.3 Distance Learning via Satellite

Project description

This project uses modern technologies to expand educational opportunities for both rich and poor students in all regions comprehensively and equitably. The project coverage began from pre-school, kindergarten through university, in both academic and vocational fields. The project aims to help alleviate the problem of lack of teachers in rural/remote schools, especially in foreign languages, sciences and mathematics.

This project is executed by the *Distance Learning Foundation* (DLF), established in 1995 in commemoration of His Majesty the King's Golden Jubilee celebrating 50 years of his accession to the throne. HM the King graciously bestowed 50 million Baht donated by the Telephone Organization of Thailand as the initial funding for the foundation. Later on, various public and private organizations have continued to donate funds to the Foundation.

Methodology and process

A radio receiving and sending station has been established at Klai Kangwol School to transmit educational programs via satellite to participating schools. The DLF and the Royal Thai Army have installed equipment for long distance learning via satellite for these schools. According to data from 2001, approximately 3,000 schools throughout the country were involved in this project.

Once the equipment were installed, the DLF has developed programs to promote the effective use of the network. For instance, providing training on how to use the equipment and other relevant knowledge to concerned officials in the participating schools.

In addition, the DLF has also prepared and distributed teacher's manual for distance teaching via satellite to assist teachers in the participating schools. The contents of this manual consists of the program and the scheduled air time, as well as detailed information on how to teach each subject, the subject matter of the course, and other necessary information, including activities for both the schools that transmit the signal and the schools receiving the signal.

Website of the Distance Learning Foundation, showing a class taught by His Majesty the King to school children at Hua Hin.

Concepts related to poverty reduction

1. On January 19, 1999, His Majesty the King stated "If the people are educated, then it means that children can study various subjects well including sciences and languages. They will be able to sustain a living, a good living, a very good living…" (from Kwankaew Vacharotai, Distance Learning via Satellite: Life Learning, pg. 4)
2. The curriculum for distance learning is comprehensive, complementary to the primary, secondary and university levels, and also covers a wide-ranging number of subjects. Thus, it is considered to be a practical way of developing people and educating them so they can use this knowledge to earn a living and improve their opportunities of entering the work force as qualified workers.
3. Distance learning via satellite provides equal opportunity for education for people from all backgrounds, gender, and physical conditions with no space or time constraints. Thus, this kind of educational system will allow people interested in learning to study throughout their lives and develop their living as they wish.
4. The project is an original and innovative concept for low-cost asymmetric instructional service, whereby the broadcast model via satellite was used in distributing the courseware, and the return path to the teacher used the low-cost telephone and fax network. In addition, as from 2001, the DLF e-Learning website of the project now provide online, on-demand video services of most broadcast programs.

Project objectives

Expand educational opportunities for students in terms of:

1. **Quantity:** Educational institutions using a classroom setting can quickly

reach a larger audience, including students and interested members of the community who are interested in learning;

2. **Quality:** Students in distant provinces will have an equal opportunity to learn and study as students in the urban areas. It will also promote formal and non-formal education as well as leisure education.

Expected outcome

Create opportunities for students and interested learners to receive equal quality education irrespective of their location in Thailand. Increase skills and knowledge of oneself and use this information to earn a living.

Technology Components

Satellite broadcasting, Digital broadcasting, Television production, Internet, high-speed networking, VCD, telephone, fax.

Status

This project has operated continuously since 1995 and some projects have been expanded to include neighbouring countries such as Laos and Vietnam.

Executing Agency

Distance Learning Foundation (DLF) http://www.dlf.ac.th

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3.4 Constructionism Laboratory at Ban Samkha

Project description

This project aims to strengthen the community and serve as a model for a self-sustaining community based on the *Constructionism theory* advocated by Professor Seymour Papert from MIT, USA. Constructionism is based on the idea that the learner creates their

own knowledge by learning from their own experiences and actual behavior. The development of human resources will help develop the quality of life of people in the community and society.

This project is supported by: the Suksapatana Foundation, Thaicom Foundation, the Non-formal Education Center – Northern Region, National Electronics and Computer Technology Center, Krung Thai Bank, the TOT Corporation and the Charoen Phokaphand Group (CP).

Methodology and process

1. The community solves problems originating from lack of knowledge in management by adopting the constructionism theory of learning.
2. Create opportunities for community members to participate in analyzing and finding a solution to problems by learning from both successes and failures.
3. Create activities for children and youths to learn about management from real-life experiences leading to development of locally driven knowledge, planning and systematic and careful management.
4. Use technology in learning starting from children and youth in schools and then spreading to the community. This knowledge can be used to develop community in several areas.

Concepts related to poverty reduction

Successful education development and adoption of a better learning method can contribute to effective problem solving and systematic planning and management in a knowledge-based society. This will help develop human resources in society and help improve the quality of life and standards of living.

Project objectives

1. Equitable development in both knowledge and skills such as social development, general knowledge, and human resource development by using various learning methods.
2. Development that emphasizes hand-on learning in every subject.
3. To make technology and education accessible to underprivileged people in rural/remote areas.

Expected outcome

First develop a successful pilot project in a limited area by emphasizing education reform that stresses learning instead of teaching. Improve the content of the curriculum which will serve as a model that can be later applied to a wider area. The pilot project should be suitable for Thai society and culture and can be realistically implemented at the national level.

Results show that using knowledge learned through the constructionism model can help solving the community's bad debt problems using a single family and community accounting system. In addition, youths and community members can benefit from ICT and learn about management from real-life experiences. They can use this knowledge to create projects such as a community center, brain bank project, *Lanna* language classes, and operations of the community radio.

Technology Components

Spread sheet/Internet/GIS

Status

In progress (managed by the community)

Executing Agency

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3.5 Data Catalog for Community Products (www.siamvillage.net)

Project description

This is a project to develop an information and communication system to be used as a tool to manage data catalog for community products in the country. The data are archived in a database, which includes information about the different kinds of community products, place where it is produced, quantity, quality and standards of the product, availability of raw materials and the product itself, will be made available at www.siamvillage.net. Such information serves as the basis for future management of community products in promoting them for the international market.

Methodology and process

1. Collect information about community products from 16 community-supporting organizations in Thailand.

2. Create an information system with necessary metadata, to allow for easy search and data management.
3. Use Internet GIS to publicize results.

Concepts related to poverty reduction

A well-developed information system of community products should help in a better management of raw materials and manufactured goods. Furthermore, organizations related to standards and packaging will have an overview of the entire process and can provide appropriate assistance. Coordinated use of the information will lead to sustained production of community products and thereby, increasing income and improving the standards of living in the community.

Project objectives

1. Create a data catalog for community products and communities that produce products nationwide.
2. Create a Back Office system used in production planning.
3. Use available data to develop the quality and standards of community products.
4. Create clusters of raw materials production and products processing in the community.

Expected outcome

To systematically use available data to develop the quality and standards of community products in each category.

Technology Components

1. Open source software: Postgres database, Executive Internet GIS system is composed of SVG, Java, PHP.
2. Commercial Software: Easy Chart

Status

In progress. There are about 15,000 village products on the website.

Executing Agency

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