Evaluating and understanding the challenges and potential of ICT based aid to least developed countries:

A case study in the Lao PDR

By

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Conducting field study in a foreign country, followed by the process of analyzing and writing the thesis, I have depended on others for help. In this project many people deserve thanks for encouragement and support.

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"IT is a powerful tool with diverse applications. Our challenge is to put that power at the service of all humankind." Kofi Annan

Abstract

This thesis describes the challenges and benefits of introducing new information and communications technologies (ICT) to developing countries using a field case study of the Lao PDR as an example. The thesis starts by describing the visions and plans defined by the United Nations (UN) when it proposed ICTs as important tools for developing countries to move towards UN defined development goals. Specifically, the UN proposed that inclusion in the information society would have social and economic benefits for developing countries. Areas thought to have great potential to benefit from ICTs are education, health, farming and government. The Lao PDR, a Land Locked and Least Developed Country was chosen for a field study to reveal the Lao peoples´ understanding of the benefits and challenges from using ICTs and to investigate the potential for achieving the UN strategic development goals through ICT development aid. Interviews were carried out with representatives from the educational sector, the government and donor organizations. These findings are the framework for developing the Country Design Development Project (CDDP) model. The main feature of the model is the emphasis on knowledge of the target group to tailor ICT developing projects to their specific needs. Applying the model can add important insight to the theoretical and macro perspective provided by international organizations such as the UN. This can give support to the idea that ICT can be used to foster social and economic development in a developing country.

Keywords: ICT, Development, Field Studies, the Lao PDR.

Figure list

Table list

Picture list

Table of contents

1 Introduction

Writing a Master degree thesis includes a number of phases from start to finish. Selecting a topic to work with for a year requires true interest in the chosen subject. Carrying out the study, as well as the process of constructing the thesis from introduction to conclusion provides the student with in-depth knowledge of the various stages required in social research. The planning began in April 2003, and the project was carried out from August 2003 through September 2004.

1.1 Personal motivation and background

The factors influencing the design of the research project included the wish to conduct a field study in a foreign country, and a special interest for developing projects.

Growing up in a developed country like Norway, computer-based technologies have been a part of everyday life for the past 10 years. These technologies are now standard in the fields of education, banking, administration, and entertainment.

The past five years my studies have included pedagogic, cultural studies and information science. At graduate level at the Institute for Information Science and Media Studies, I have completed the following courses:

- Contemporary and historical perspectives on pedagogical information technology
- Gaming: Methodology and practice
- Research methodology
- Human computer interaction

Traveling and studying in developing countries has increased my awareness of the significant differences between developed and developing countries. Based on my studies in Information Science, it has become evident that the benefits of information and communication technologies can be considerable if introduced properly. In my opinion, some of the greatest challenges the international community is facing today are the issues related to the "digital divide". The digital divide is the gap between the people with and without access to new information technologies. Relevant questions to be asked include: What role can information and communication technology (ICT) play in social and economic development? In what fields can ICTs benefit the most? These questions will be addressed in this thesis.

1.2 The project

When discussing ICT for development a dilemma arises concerning the superficiality of promoting Information Technology to developing countries. These countries have serious problems providing its inhabitants with food, potable drinking water and health supplies. In what way can ICTs benefit them in their situation? I wish to make it clear that providing the world's population with essential necessities such as food and potable drinking water should always be the first priority. Still, I believe that discussing equal access to ICT is an important and worthwhile study. If not treated seriously by the international community, developing countries will fall even further behind. In a long-term perspective ICTs can be an important means for fighting poverty. Why and how to include developing countries in the information society will be discussed and exemplified in the chapters of literature review, analysis and discussion.

One purpose of this project is to learn more about the people living in a developing country and their perceptions of information and communication technology. Their views are invaluable in the quest to gain knowledge of how ICTs can improve living conditions and reduce poverty, and how ICT can be implemented successfully.

I believe that ICTs can be viewed both as a channel for sustainable development and a goal for that development process. Such a strategy provides people new job opportunities as well as increasing the basic value of human capital within the country. Teaching computer skills can be done to reach the ultimate development goals through the information technology tools made available. In such a perspective, technology is not only the reward of, but also the enabler for development.

For this study, research was conducted in the Lao People Democratic Republic (Lao PDR). Throughout my discussion, I hope to provide the readers with an understanding of what is important and valuable for people in the Lao PDR, the Lao government and the international community represented by the United Nations.

In the thesis I will present and discuss aspects such as;

- How can ICTs be introduced to developing countries as a tool to prevent poverty?
- What does the "digital divide" really mean?
- What is real access to ICT?
- What are the strategies for successful development projects?
- What do people in a developing country see as the main challenges and benefits given by ICTs?
- How are these issues addressed by the United Nations?

In the thesis the official country name, the Lao PDR, will be used. The Lao PDR is used by the country itself and by the United Nations. Even though *Laos* is commonly used, especially verbally, it is politically correct to address the country as the Lao PDR. Exceptions will be made when performing interviews and referring to oral discussions.

1.3 Relevance

ICT for development has become a visible element in international debates. In December 2003 delegates from the whole world gathered in Geneva, Switzerland to discuss how ICT can benefit all nations. ICTs are also seen as an important tool to implement the Millennium Development Goals defined by the United Nations.

It has been stated by Secretary-General of the United Nations Kofi Annan that:

> "The new information and communications technologies are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, the gap between information 'haves' and 'have-nots' is widening, and there is a real danger that the world's poor will be excluded from the emerging knowledge-based global economy" (Annan 2002).

Through this thesis I wish to advocate the importance of including all people in the information society to foster social and economic development.

Picture 1: Lao children

1.4 ICT or computers and the Internet?

The international community and the UN operate with the term "information and communication technology" (ICT). Even though this thesis focuses mainly on computers and the Internet, the term ICT is used as a generic term. This is because the term is widely used among researcher in the field. Computers and the Internet are the most common modern ICTs and further specification has therefore not been made. Throughout this thesis the term ICT will be used. When this refers to technologies other than computers and the Internet, it will be specified. Further term specification will be given in Chapter 2.

2 Literature review

The theory of ICT for development is an important component of this research. This includes term specification and presentation of fields that are likely to benefit from ICTs. The background and goals of the United Nations provides justification of fostering social and economic development by using ICT in developing countries. The Lao PDR is introduced in context of this research.

2.1 The United Nations

The United Nations (UN) was established in 1945 based on an agreement among 51 countries. In this post-war period there was need for an international organization to maintain peace, security and human rights. In 2003, the UN had expanded to include 191 member countries. When nations wish to join the UN they agree to accept the obligations defined in the UN charter. This is an international treaty outlining the basic principles for international relations. According to the charter there are four main purposes of the United Nations. These are to:

- maintain international peace and security,
- develop friendly relations among nations,
- cooperate in solving international problems and promote respect for human rights, and
- be a center to harmonize the actions of nations (UN 2004).

The main goal of the UN is to promote peace through international cooperation within the member countries (UN 2004). This is practiced through the six principal organs (see Figure 1). In addition to these, there are various commissions, programs and groupings that make up the United Nations.

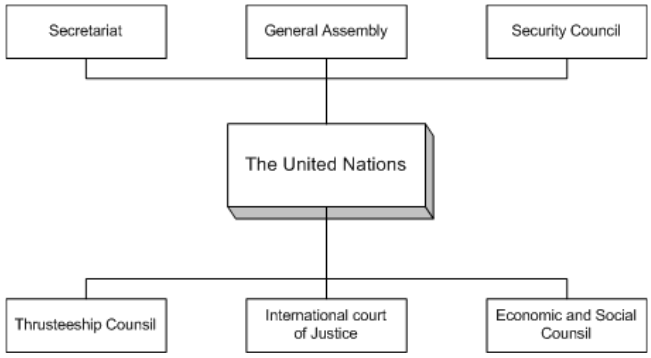


Figure 1: The principal organs of the UN

2.1.1 Millennium Development Goals

Since the 1990s, UN members have been involved in projects to end human poverty. In 2000 the 147 member countries met to set the agenda for the new millennium. Based on previous efforts and plans the outcome of the meeting was a set of goals for development referred to as the Millennium Development Goals (MDG). Together they form a "compact among nations to end human poverty". Most of the goals are to be achieved over a period of 25 years, many of them started in 1990 (UN/MID 2004).

Millennium Development Goals:

- Eradicate poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

Figure 2: The UN Millennium Development Goals (UN 2003)

To meet each of the eight goals the UN has defined several targets. They are helpful in separating the goals into specific fields and actions. At country level the goals should be tailored to meet the specific needs of the country.

> "Countries are tailoring the MDGs to national circumstances, building them into national development strategies and policies, and incorporating them in budgets and ministries' priorities" (UNDP 2004)

Eradicate poverty and hunger

The first and superior MDG is to eradicate poverty and hunger. Within year 2015 the UN resolves to halve the proportion of the world's people living in poverty. By definition, poverty describes people living on less than $1 pr day (UNSTATS 2004). When using this parameter for measuring poverty, only economics are taken into account. The World Bank uses a broader definition of poverty suggesting that poverty includes vulnerability, powerlessness, voicelessness and fear (Harris 2004).

Figure 3 shows the percentage of people that live on less than $1 pr day, the poverty levels by region from 1990-1999, and estimates where the poverty level will be in 2015. This is under the assumption that the development continues to be the same as 1990-1999. In addition, it shows the desired 2015 MDG level. The shaded area illustrates the differences between the 1999 levels, the projected 2015 levels, and the MDG levels.

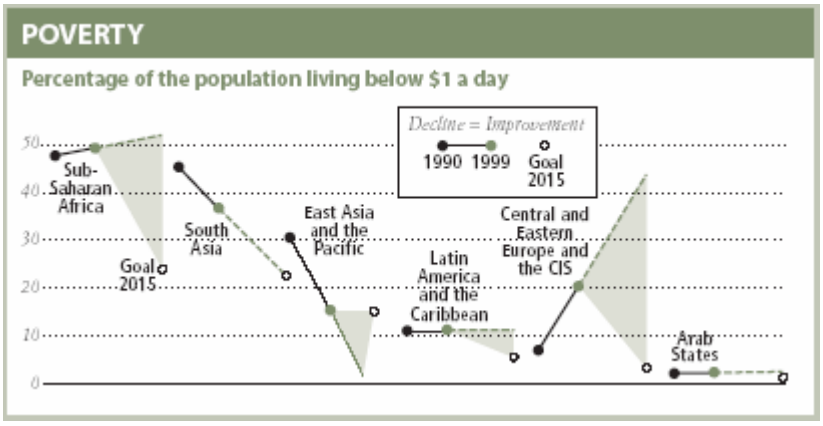


Figure 3: Poverty (UNDP 2003)

South Asia is doing well in reaching the MDG (Figure 3). That is, if their economic development remains steady until year 2015. The opposite can be seen in Central and Eastern Europe and the CIS (Commonwealth of Independent States). The percentage of poor people living in these countries increased in 1990-1999. If the trend continues, this region will have more than 40% of its population living on less than 1 USD pr day in 2015.

To prevent an increase in poverty, the UN pushes each region to define an action plan for poverty reduction. This should be done at different levels within the organization and in cooperation with local governments and regional and local commercial businesses.

To classify countries with special needs based on economic situation or geographic location the UN introduces two categories: Least Developed Countries and Land Locked Countries. These will be defined in the following sections.

2.1.2 Least Developed Country (LDC)

The UN operates with a list of the least developed countries in the world. In 2003 the group included 49 countries. The criteria for being characterized as a LDC are:

- low income,
- weak human resources, and
- high economic vulnerability (OHRLLS 2003).

2.1.3 Land Locked Country (LLC)

Land Locked Countries (LLC) is countries that do not have territorial access to coastline. According to the General Assembly report by the UN, Land Locked developing countries are among the poorest in the world. Of the 30 Land Locked Countries, 16 of them are also Least Developed Countries. They have the weakest growth rates and are typically heavily dependent on only a few commodities for export earnings. Lack of territorial access to the sea combined with remoteness and isolation from world markets seems to be the primary causes to their poverty (OHRLLS 2003).

In the UN special report on Land Locked Countries it is found that such countries are more dependent on other countries. This dependency gives them:

> "[…] relative lack of control over the development of infrastructure, transport management and policies, which normally would be shaped by the countries own considerations and interests" (Chowdhury 2003: 2).

2.1.4 ICT in the Millennium Development Goals

Of special interest to this thesis research is the eighth Millennium Development Goal (MDG) to "develop a global partnership for development". In one of the targets it is recommended to;

> "In cooperation with the private sector, make available the benefits of new technologies, especially information and communication technologies" (WorldBank 2003).

To indicate or measure the targets given in the MDG, a set of indicators has been determined. For the 18th target to the 8th goal presented above, the indicators address the ICT situation. This includes telephone lines, cellular subscribers, personal computers and Internet users per 100 capita (UNSTATS 2004).

In action plans for poverty alleviation, information and communication technology has become an increasing element. This is in line with the recommendations in the MDG. The Economic and Social Commission for Asia and the Pacific has defined an overall strategy to:

> "Foster the application of information and communication technology (ICT) for poverty alleviation, and the development of appropriate pro-poor contents, through pilot projects demonstrating best practices" (UNESCAP 2001: 12).

The inclusion of ICT in the Millennium Development Goals shows that the UN sees the importance of using ICT to fight poverty. For this to have any effect, attention must be given to the factors for success, strategies for ICT development, target groups, and employment of ICT.

2.1.5 Globalization

Technological development has made the world a smaller and more integrated place to live in. Transportation, telephones, and mass media have all become widespread. Today, it is still expanding because of the ICT revolution. The World Bank defines globalization as "the growing integration of economies and societies around the world" (Worldbank 2001).

Globalization is a phenomenon that not only affects economic issues, but all aspects of life. Lallana suggests that globalization is carried out by mainly these four factors:

> "(1) technological change, particularly the ICT revolution;
> (2) the spread of market-based systems;
> (3) domestic politics – pro-globalization forces are more politically significant; and
> (4) inter-state rivalries" (Lallana and Uy 2003: 27)

The close relationship between technology and globalization is also discussed in the Human Development Report 2001:

> "Today's technological transformations are intertwined with another transformation—globalization—and together they are creating the network age" (UNDP/HDR 2001: 27).

The information society is carried onward by information technology. It is an extremely flexible network and can be defined as interconnected nodes with no center. This organizing of the society is the main characteristic of the information age. To be, or not to be, in the network is the most important aspect of the structure (Castells and UNRISD 1999).

2.1.6 The fourth world

In every corner of the world, both within developing countries and developed countries, there are groups of people that do not take part in the information society. They can be characterized as belonging to the fourth world. The main characteristics of these people are that they have "lost value for the dominant interests in information capitalism" (Castells and UNRISD 1999:10). Reasons for this might be related to economy, education, health, social issues, awareness, access, knowledge and interest.

2.2 ICT for development

ICT is short for Information and Communication Technology. There exist numerous definitions of what ICT includes. Some argue that it is limited to computers and the Internet while others wish to include more traditional and common technologies. In the widest definition ICT embraces radio, television, telephone, newspapers, walkie-talkie and handheld devices (Harris 2004). A distinction is often made between "old" and "new" ICTs. Typical old ICTs are radio, newspapers, television and telephone, while computers and the Internet are the major new technologies.

Equal access to resources has been and is the main issue for people and organizations concerned with developing aid. This covers access to food, clean drinking water, medicine and education. The traditional approach in developing aid is concentrated on health and health-related issues. Disease outbreaks, natural disasters and famine call for emergency action plans to save lives. Health promotion and disease prevention are major areas for developing aid projects.

ICT is becoming more prevalent in the developing aid business. Still, proof of significance is required to see the effect it has on peoples' life. It is commonly stated that the issue is not whether or not to use new technology for alleviating poverty, but how to use it. ICTs tend to benefit groups with plenty of resources. These are educated people that most often live in urban centers. The extremely poor groups, who tend to live in rural areas, are often farmers and share a lack of formal education. Many of the poor are also illiterate. Their location and poor infrastructure leave many of them in isolation (Kenny, Navas-Sabater et al. 2001).

Harries (2004) discusses the need for strategy plans when discussing ICT for development. The application of ICTs in development projects can be exaggerated. Some people may not use ICT to their best advantage in some projects, and may in fact overuse it. Extensive and exaggerated use can result in the loss of credibility of "ICT for development". The most important aspect of the strategy is:

> "re-thinking development activities by analyzing the current problems and associated contextual conditions, and considering ICT as just one ingredient of the solution"(Harris 2004: 15).

When defining a development strategy, Harris recommends taking a bottom-up and demand-driven view rather than top-down and supplier-driven objectives. Following the advice of Harris, one has a better chance of sustainable development projects.

The Human Development Report presents a model that illustrates the close relationship between building human capabilities, economy and technological change (Figure 4).

> "Technology is like education—it enables people to lift themselves out of poverty. Thus technology is a tool for, not just a reward of, growth and development" (UNDP/HDR 2001: 27).

It is further stated that technological innovation has two ways of affecting human development. One way is through directly enhancement of human capabilities. As illustrated in figure 4, technological changes affect human capabilities in different ways. The main areas are medicine, communications, agriculture, energy and manufacturing. Access to information and communication can:

> "directly improve people's health, nutrition, knowledge and living standards, and increase people's ability to participate more actively in the social, economic and political life of a community" (UNDP/HDR 2001: 28).

Another way that technological innovation influences human development is illustrated in the inner cycle of the model. Technology has impact on economic growth through increased productivity. This generates productivity gains that affect human capabilities and also provides a basis for further technological innovation.

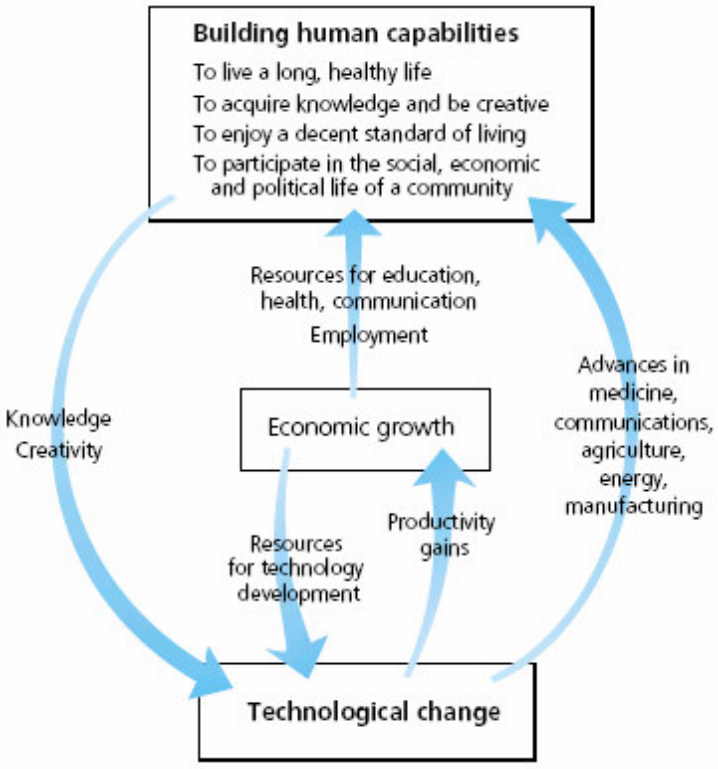


Figure 4: Building human capabilities, economy and technological change (UNDP/HDR 2001: 27)

Given the right circumstances, ICTs have proven capable of promoting social and economic development (Harris 2004). This has been evident within health care, education, employment, agriculture, and trade, and also of enriching local culture. According to Kenny, "ICTs bridge the distance between remote communities and service providers – markets, government departments and aid agencies"(2001: 7-8).

"Leapfrogging" is a concept widely used when discussing ICT and development. It "implies a quantum leap from the traditional stages and cycles of progress to the information society" (APDIP 2004). To take advantage of modern technology gives developing countries the possibility to catch up with several centuries of development in a few decades. ICTs can make this possible through for example use of wireless technology.

2.3 Digital Divide

The "digital divide" is a term used to describe the gap between the ones with and without access to ICTs. A more detailed definition is provided by the Organization for Economic Co-operation and Development:

> "The difference between individuals, households, businesses and geographic areas regard to their opportunity to access ICTs and their use of the Internet for a wide variety of activities. It is the gap between those who have real access to information and communications technology and who are able to use it effectively, and those who don't have such access"(Lallana and Uy 2003: 30).

In the given definition emphasis is placed on *real access* to ICT. What real access implies will be further presented in the next section (2.4).

The digital divide is used to describe differences between groups of people created by digital devices. Some researchers advocate that the digital divide is further increasing the gap between developed and developing countries. The report, "The future of Information and Communication Technologies for Development" defines three dimensions of the digital divide: access (affordability and connectivity), basic skills and relevant content (Braga, Daly et al. 2003).

To measure the digital divide, Lallana has defined three indicators. Together the indicators signal the population's access to ICT. The main indicators are:

- telephone density (teledensity),
- personal computer penetration and deployment, and
- the number of Internet users (Lallana and Uy 2003).

Some people disagree on the discussion of digital divide, claiming that it emphasizes the wrong issues. Opponents do not consider the problem access to technology or not, but rather the unequal access to knowledge and information and the consequences of this. However, technology is not necessarily the only solution to these problems, but can a mean for providing and fostering information and communication.

2.4 Requirements for using ICT

As mentioned previously, ICTs tend to benefit privileged groups the most. They tend to use ICTs more efficiently and the paybacks are exponential. This results in these groups becoming even more privileged (bridges.org). Development projects with focus on ICT must take into account different issues such as access, affordability, content, software, human capitol and language. Once these are studied and considered according to the local needs, ICT can contribute to social and economic development.

Bridges.org is an international organization derived from the technology community. Its main focus in to promote effective use of ICT in developing countries to improve people's lives. They introduce the term "real access" to technology that relates to integrate technology in a way so that people can use it to improve their lives. Further, they introduce twelve criteria for real access:

12 criteria for real access to ICT

- Physical access: Is technology available and physically accessible?
- Appropriate technology: What is the appropriate technology according to local conditions, and how do people need and want to use technology?
- Affordability: Is technology affordable for people to use?
- Capacity: Do people understand how to use technology and its potential use?
- Relevant content: Is there locally relevant content, especially in terms of language?
- Integration: Does the technology further burden people's lives or does it integrate into daily routines?
- Socio-cultural factors: Are people limited in their use of technology based on gender, race or other socio-cultural factors?
- Trust: Do people have confidence in and understand the implications of the technology they use in terms of privacy, security and cyber crime?
- Legal and regulatory framework: How do laws and regulations affect technology use and what changes are needed to create an environment that fosters its use?
- Local economic environment: Is there local economy that can and will sustain technology use?
- Macro economic environment: Is national economic policy conductive to widespread technology use?
- Political will: Is there political will in government to do what is needed to enable the integration of technology throughout society?

Figure 5: 12 criteria for real access to ICT (bridges.org 2004)

Following, a selection of the criteria is presented. The selection is not only related to the importance, but to which of the criteria needed further description. For a in depth discussion, please visit the organization's web page (bridges.org 2004).

2.4.1 Accessibility and affordability

There are several reasons why people are not gaining access to ICTs. One of them is physical lack of access to the needed infrastructure. Mainly, this is an economic problem where introducing ICTs does not pay off. The cost might be too high because of terrain or other geographical conditions. In Table 1 the most common ICTs; TV, telephone and Internet, are included. The first graph from the left shows how the world's population is divided based on their economic class being low, lower middle, upper middle or high. For Internet use about 90% of the users belong to the high class (Kenny, Navas-Sabater et al. 2001).

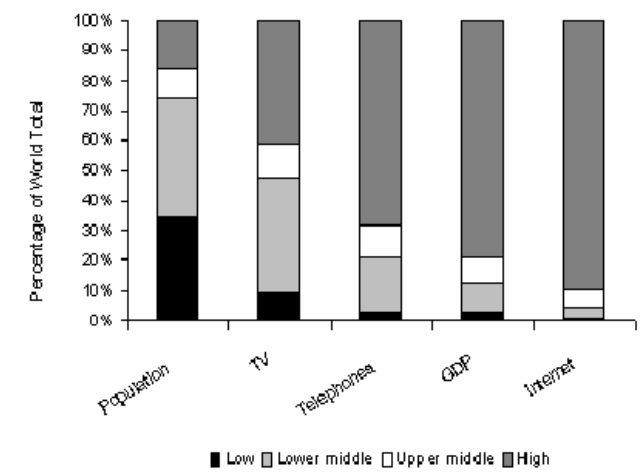


Table 1: Global Distribution of ICT by income-level groups

(Kenny, Navas-Sabater et al. 2001)

Affordable technology is one of the critical factors for introducing ICTs to poor people. With high poverty levels, they cannot afford neither telephone subscription, nor extra expenses for computers and Internet charges.

2.4.2 Local content

Surveys of Internet users and providers in developing countries reveal that "the lack of local language and locally relevant content is a major barrier to increased use" (Harris 2004: 16). The effect of local content can be illustrated in a feedback loop also referred to as the network circle. The increase creates a community of Internet users, which will result in the net being a more attractive commercial and social media. This again results in more relevant content for the community presented on the Web. When this is the case the number of members within the on-line community will increase (See Figure 6).

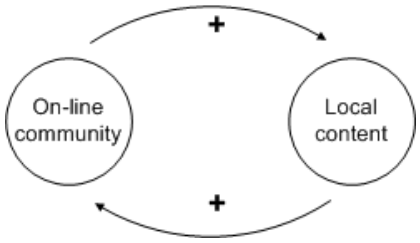


Figure 6: The network effect

2.4.3 Human capacity

When implementing and using new technology it is very important to have knowledge about functionality, potential and maintenance. Many people in developing countries that gain access through development projects do not have the human capacity needed to maintain and use the technology once the projects are ended.

2.4.4 Language

Language can be an obstacle when using computers and the Internet. The majority of software and content on the Web are in the English language and only a small percentage of the world's population speaks English.

2.4.5 Free/Open Source software (FOSS)

Together with the other criteria for real access to ICT, the chosen technology can be an obstacle for using ICTs. Software programs are often very expensive and a country's language version may not exist or is developed slowly. Using free or open source programming can benefit developing countries by providing access to the software they need in their native language, free of cost (Braga, Daly et al. 2003).

2.5 Inclusion or exclusion of the information society

The flexibility of the information society allows the overall system to link up and include everything that is seen as useful and valuable to the society. At the same time, it is possible to de-value and exclude things that conflicts with the dominant values and interests. The new global economy constituted in the information age is characterized by this simultaneous capacity to include or exclude people, territories and activities (Castells and UNRISD 1999).

Within today's society, information and communication technology is an important tool that conditions power, knowledge and creativity. Further, it is argued that ICT has two roles in stimulating development. First, it allows nations to leapfrog several stages of economic growth in terms of modernization and increased competitiveness. This has been the case in many Asian countries, for example Hong Kong, Taiwan, Malaysia, Singapore and South Korea (Castells and UNRISD 1999).

Second, ICT has the ability to strengthen exclusion for countries that are unable to adapt to the new technological systems.

> "Uneven access to ICT tools and networks – within countries and between countries – both reflects and threatens to exacerbate, existing inequalities" (EO and UNDP 2001: 2).

There is a general agreement within international organizations of the importance of including every nation in the information society.

2.5.1 ICT and poverty

International communities discuss whether ICTs are applicable for alleviating poverty. Some see it to be the missing link for developing countries while others do not see the importance of it. People in developing countries often view ICTs with an enormous optimism for being a

tool that will improve their economic situation. Similar to the positive attitude to technology in the 1960-70s in industrialized countries, this optimism is also found in developing countries (Feroli 2001).

In developing countries the poverty is often concentrated in the rural parts of the country. People living in rural areas have, according to UNDAF, "lower incomes, higher food insecurity and malnutrition levels, and experience higher levels of mortality, lower levels of educational attainment, and lower opportunities for economic advancement"(UNDAF 2002: 64).

Projects for development have been tested out with varying results. Unsuccessful projects are found in every field, ranging from infrastructure to health projects. One example of this is a project aiming at providing rural people with radios. Initially, this could be seen as a worthwhile project. But shortly after receiving the radios, they were useless to them because they could not afford to purchase new batteries. Despite that fact that unsuccessful aid projects do occur, many projects have positive impact on the receivers' social and economic development. Through extensive use of ICTs the digital divide can be bridged, leapfrogging developing countries into the 21st century.

2.5.2 ICT and economy

For developing countries to experience economic development, they must be included in the information society. According to UNESCAP, "information and communication technology (ICT) is the main defining element of the new economy"(UNESCAP 2001: 18).

The information economy is according to Lallana based on three features implying that:

- the information economy is global,
- the information economy is highly productive, and
- includes a change in the manner of obtaining profits (Lallana and Uy 2003).

When using ICT for development there are different elements that must be included for success.

> "The three characteristics that are critical to sustainable deployment of telecom systems […] are affordability, ease of deployment and appropriate business models" (Braga, Daly et al. 2003: 17).

According to Kramer and Dedrick, economists agree that "technology innovation and diffusion plays a critical role in stimulating economic growth and productivity"(Dedrick 2002: 2).

2.6 The role of education in developing projects

In developing countries health based aid is vital for many peoples' survival. Still, it might not be the only and best solution when taking a long-term perspective on development. Healthcare is an area that needs major contributions over many years in order to have preventive effects. Looking beyond the immediate needs, education can be a more effective means for poverty alleviation. Investments in education can give better profit due to the fact that educating people will have ripple effects. Especially when educating females, the

likelihood that the whole family will benefit is high. An example is to teach women preventive health care that they again can pass on to the rest of the family. Higher income will more likely be used to feed the family and send the children to school. In addition to the economic value of education, higher levels of knowledge can be helpful in everyday life. However, the dilemma of educating starving people should also be included. Undernourished people will most likely have problems concentrating and learning. Health and education are closely connected and which to give focus should be decided based on the specific situation (Kenny, Navas-Sabater et al. 2001).

The Millennium Development Goals include two goals that directly or indirectly relate to education. One of them is the second goal, aiming at "achieving universal primary education" (UN/MID 2004). This means that boys and girls alike should have the chance to complete primary schooling. Another goal is to promote gender equality and empower women through eliminating the gender disparities in education. Education is also important for meeting the other goals. It is emphasized in the Human Development Report of 2003 that "education is critical to improving health, nutrition and productivity" (UN 2003: 33). The strong focus that the UN places on education and gender implies the importance of it and is also the main focus in further discussion.

2.6.1 Gender equality

The United Nations Development Program sees gender mainstreaming as a process or a strategy to work toward the goal of gender equality – it is not an end in itself. A growing number of developing aid projects are designed specifically for women. Today, women in developing countries have the lowest education and are the most illiterate of the sexes. This along with cultural, religious and economic restrictions places women in a vulnerable situation. Experience has shown that in the cases where women and men are relatively equal, economies tend to grow faster. This results in enhanced well-being for men, women and children (Gateway 2004).

Further discussion will relate more precisely to how, what, why, and when ICTs are applicable for dealing with poverty alleviation within relevant areas of discipline. Attention is given to ICT in education, health, farming, and government and administration. The role of ICT to foster economic development in small and medium size enterprises (SME) will not be explicitly discussed.

2.7 ICT in education

Within education ICT can be used in several different ways. ICT function can range from tools supplying traditional education, to being the main medium for online and distance education.

2.7.1 Radio

According to Kenny, radio is the most widely used electronic media in distance learning programs in developing countries. This is mainly due to its cost effectiveness. Adkins (1999) has studied seven educational interventions and discusses the cost effectiveness related to them. The results, in terms of incremental improvement, demonstrates that spending 1 USD on radio instruction gives 70% higher impact than 1 USD spent on textbooks, and 11 times higher impact than 1 USD spent on teacher training (C. Kenny 2001).

2.7.2 Television

Use of television for education has been tested and proved very successful in Mexico. More than 700 000 students in secondary schools have access to televised classes and curriculum through closed circuit television, and teleconferencing between students living in rural villages and teachers. The cost to accomplish this is slightly higher than traditional teaching in urban areas, but the students benefit from the smaller student-to-teacher ratios (Harris 2004).

2.7.3 The Internet

Teachers can benefit from the massive amount of information on the Web and use this as a supplement in their teaching. Also, teachers can join teacher training and discussion groups and gain knowledge about new pedagogical approaches to teaching. Another use of the Web within an educational setting is for the students to search for information to supplement textbooks. This is especially useful in projects where the students need in-depth information on a specific topic. Both students and teachers can benefit from joining discussion groups on the Internet where they can share experiences and find answers to their questions. Within developed countries, Learning Management Systems (LMS) have become popular tools.

2.7.4 Online education and distance education

Applying old or new ICTs in educational settings provides different ways of teaching and learning. E-learning attempts to replace the entire educational setting and transfer it to the Internet. This can be useful for people who wish to join classes in other countries or cities. Research has shown that online education benefits the elderly students more than younger ones. E-learning also tends to benefit the already privileged. Distance education is not only provided by the Internet, but often uses traditional methods for reaching students situated elsewhere. This can be through letters, radio and television like presented previously.

A study in Taiwan shows that an online distance-based university, National Open University reached about 30 percent more students at one third of the price compared to the National Taiwan University (Kenny, Navas-Sabater et al. 2001). Another successful project was carried out in India, in which a computer was built into a brick wall facing a street often crowded with street kids. The children who had not received any schooling demonstrated interest in the computer and figured out the functions in a short amount of time. Soon these early learners had taught the rest of the group how to use the computer (Harris 2004). Even though some projects have proven successful there is still disagreement on how effective ICTs are as educational methods.

2.8 ICT in health care

Health care consists of two major areas: health promotion and treatment. The first field definition of health promotion focuses on promoting health by “providing a decent standard of living, good labor conditions, education, physical culture, means of rest and recreation” (Terris 1996: 35). The role information and knowledge has in the health sector makes it a promising area for the application of ICT. In health-based aid, ICTs offer one possible approach for meeting the challenge of providing training for healthcare providers. The availability of modern ICTs gives new opportunities for training as well as being a source for information.

Using ICTs can give rural villagers access to health related information. In West Bengal the International Telecommunication Union (ITU) carries out the project "Information & Communication Technology for People's Empowerment". Through this work they wish to promote health care through ICT channels.

Picture 2: Health promotion through ICT in West Bengal (WBVHA 2003)

ICT can serve as a useful tool for both local inhabitants and health workers. It provides health workers the opportunity to discuss problems and cases with other professionals. Historically, the mass media has proved to be an effective means for reaching out to large numbers of people. This can be helpful for dealing with cases of epidemics and disease prevention techniques.

Many developing countries have been excluded from international cooperation because of limited resources. The World Health Organization (WHO) and six of the major medical journal publishers have provided access to scientific information databases to about 100 developing countries. If not for this free access, the developing countries could not afford the fees for membership in such highly prestigious scientific organizations. This program provides health workers access to contemporary research that can benefit the inhabitants of the developing countries in which they work (WHO 2002).

2.9 ICT in farming

The majorities of poor people lives in rural areas and are farmers. The land provides their income and is a source for survival. Both new and old information and communication technologies can be very useful for rural development. Access to farming-related information is necessary for farmers to follow the price trends. An example of the value of farmers being able to communicate with each other is taken from tomato farmers in India. Without communication amongst farmers, tomato seeds were planted at the same time, resulting in similar harvest periods, which lowered sales prices. This also caused a lack of tomatoes at other times, and the prices would be very high. When the farmers started coordinating the seeding and harvesting through a network of tele-centers, they could provide a steady supply to the markets. This created a more stable market for the farmers (Harris 2004).

Access to information of new technologies and research within the field is also useful for farmers. Communication for this group is useful because the farmers can develop a social

network. For farmers to sell crops together might provide higher prices. A survey was taken of 21 000 farmers in Zambia participating in a project using radios for information. The result showed that 90 percent found the programs and forums relevant, while 50 percent gave credit to the project for increasing their crop results (Kenny 2001) .

Another way ICT can be useful relates to control and planning of the seeding and harvesting cycles. The "Farming Diary System", illustrated in Picture 3, is a web-based software designed to receive on-site input using mobile phones that are connected to the Internet. The information is stored in a management record that later can be accessed through a database server. Using this system the farmer can access and analyze the farming data and maintain records.

Picture 3: The Farming Diary System (http://agri-it.narc.affrc.go)

2.10 ICT for government and administration

ICT can be a helpful tool to improve efficiency within government and administration and also make societies more transparent. Corruption is widespread and part of everyday life in most developing countries. This results in ineffective and bureaucratic public administration.

International organizations such as the OECD and the Transparency International are involved in combating corruption. A convention was signed among industrialized countries and is referred to as the OECD Convention.

Irène Hors, writer for the OECD Observer, states that "underdevelopment encourages corruption" (Hors 2000: 2). The main reasons are:

- low wages,
- imbalance between supply of, and demand for public services,
- career investments in the public service given few opportunities in the private sector, and
- low level of education.

According to the OECD Observer (Hors 2000), corruption is closely linked to the type of government operating in the country. More specifically this is related to the link between power and economy. For example, if this linkage is direct like it is in Morocco, access to political power automatically gives access to economic privileges. When the linkage is indirect, such as is in the Philippines, political power can be bought and sold.

Analysts working with corruption argue that the remedies lie in "greater transparency, accountability and merit-based human resource management in public administration" (Hors 2000: 2). For dealing with these issues the need for an operational strategy is evident.

Within administrative and governmental work, ICTs can benefit in different ways. First, if information on rules, laws and different application forms are made public on the Web, gives the citizens easy access to the information. Obtaining different forms and land regulations can be a troublesome process for people living in rural places. When information is provided on the Web, the villagers that have access to ICTs will be saved from extra expenses. In addition to travel costs, local services might demand extra fees for providing assistance. ICTs create a transparent process and hinder the possibilities for corruption. A second benefit is that it might contribute to a more transparent society. Providing information on the Internet might prevent delays and discrimination because of direct access to the needed information.

2.10.1 To fight corruption

One of the main obstacles in fighting corruption is economy. Networks of staff and plentiful funds are necessary to implement a strategy that fits the specific country and its needs. The strategy adopted in industrialized countries will work differently under the conditions found in developing countries. Another obstacle is politically oriented. Powerful politicians might be operating in jobs achieved through corruption and will rarely take action in cases that jeopardize their careers. Informal sanctions are often made towards the officials that perform their duties in the right manner.

When taking up the fight against corruption, pressure can be placed on governments through media and the civil society, by providing extensive information. At the international level, research can be conducted on finding means to prevent corruption and the effect it has on the society. This information can be used as guidelines for action plans and for guiding developing aid agencies. A problem in developing aid is that occasionally, part of the financial supply disappears in the process through corruption and unnecessary costs. Developing aid projects must be closely followed up by the donor nation or organization. Projects aiming at improving the educational system might face problems with the local governments. For example non-democratic regimes will not benefit from the masses receiving more education. Leaders and parties in such countries are dependent on the inhabitants being less enlightened. The challenging task for the donors is to provide education and help for the people that so that they can learn about other societies and ways of ruling that might be more democratic and focused on human rights. Education may contribute to people standing up for their rights (Hors 2000).

2.11 Country for field study

When choosing a country suitable for field study, there were several important criteria to consider. The first and main criterion was that the country needed to be a designated Least Developing Country. This group is specifically addressed in the Millennium Development Goals and face special development challenges. Furthermore, it was desirable that the country was a Land Locked Country. Countries that meet these two criteria tend to be the poorest in the world. As presented in the introduction, these countries face special challenges, including ICT challenges, because of their location and economic situation.

When exploring the field "ICT for development", it became apparent that the greater part of ICT research projects are carried out in Africa. Because of this, attention was given to another continent: Asia. Here, there are major differences in the countries' social and economic development. For example, the differences between Singapore and Myanmar are enormous.

After further studies of the countries in Asia, special attention was directed to the Lao PDR. This country met both criteria for field study. The Lao PDR is one of the least developed countries in South East Asia, also when evaluated by the ICT indicators in the MDG. In addition, the fact that the country is ruled by a one-party regime is likely to provide an added challenge to introducing information and communication technology. When determining which country to visit, it was found that the Lao PDR was the most suitable and interesting country for further study.

2.12 The Lao PDR

The Lao PDR is a relative small country hidden between its neighbors Vietnam, Cambodia, Thailand, Myanmar and China. It stretches over 236,800 sq km with 2/3 of the country mountainous and thickly forested. The capitol, Vientiane, is on the border to Thailand (see Figure 7). The administration of the country is divided into 18 provinces, 142 districts and 10 912 villages.

Figure 7: Map of the Lao PDR (CIA 2004)

The Lao PDR is a Land Locked Country. The Mekong River runs through most of the country and is of great value to the people. Fish from the Mekong River is the second largest food source for the Lao people. The main food source is rice. The country terrain challenges the farming land both in quantity and quality.

2.12.1 The Lao people

Just over 5,529 million people live in the Lao PDR (WHO 2002) and the country has an annual population growth rate of 2.8%. The population number is expected to double within the next 25 years. In 2002, 94% of the population were under the age of 29 (Minges and Gray 2002). In the Lao PDR the life expectancy at birth is 54.69 years. The people in the Lao PDR consist of 47 officially recognized ethnic groups resulting in a variety of cultures, traditions, and dialects (CIA 2004).

2.12.2 The government

The country is one of few official communist states and is ruled by the Lao People's Revolutionary Party. They took over the government in 1975, ending centuries of monarchic power. As a result of the governmental shift, non-communist political groups were banned and have been fleeing the country. During the last three decades there has been extensive emigration, especially to the United States of America (CIA 2004).

To foster economic development the government stresses the importance of introducing NEM (New Economic Mechanisms) in cooperation with other countries in the region. When introducing the new economic mechanisms, emphasis is placed on privatization, promotion of international trade and arranging for foreign investments. These efforts are done to promote a more market-oriented economy. Eventually, this resulted in Lao gaining membership in the Association of South East Nations (ASEAN) in 1997 (UNDAF 2002).

2.12.3 Education

Action has been taken to promote education over the last few years. The result has been an improved quality of education, and at the same time providing schooling to a larger number of pupils. Although the numbers are increasing, access to secondary and tertiary education is particularly limited. Groups that are underrepresented in the school system are girls and ethnic groups in remote areas. In 2004 the literacy level in the Lao PDR was 52.8%. It is estimated that for males the literacy rate is 67.5% while for females it is only 38.1%. Although the quality of education has improved, it is still not sufficient to meet the social and economic demands (CIA 2004).

2.12.4 ICT in the Lao PDR

The Lao PDR faces great challenges in providing the Lao people with telephone lines. The majority of the inhabitants live widespread throughout the country with forested mountains separating the villages. In 2002 it was estimated that fewer than 4 % of the Laotian households contained a telephone. Of the 142 districts, only 58 have fixed telephone services. Looking at the last decade, access to ICT has multiplied. In 2004, the number of telephone lines per 1 000 inhabitants in the Lao PDR has increased to 9.1(APDIP), (Minges and Gray 2002).

Mobil technology

The Lao PDR has not experienced the wireless boom as other developing countries. Compared to its neighboring country Cambodia, which has about the same per capita income and was introduced to wireless technology at the same time, there are visible differences. In 2002, Cambodia had twice the mobile penetration as the Lao PDR. In 2002 only the urban areas in the 8 (out of 16) provinces were covered by mobile cellular signal (Minges and Gray 2002).

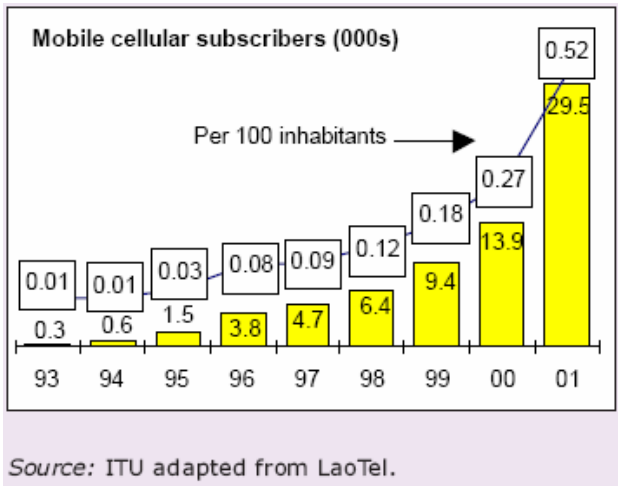


Table 2: Mobile cellular subscribers in the Lao PDR pr 100 inhabitants

(Minges and Gray 2002)

The International Telecommunication Union (ITU) presents several possible explanations. The Lao PDR was the last country in the region to open up for competition in the mobile sector and did not introduce pre paid phone cards until year 2000. Other explanations relate to the country's economy and geographic location for hampering the growth (Minges and Gray 2002).

Internet

The Lao PDR was one of the last South East Asian nations to adopt the Internet. In 1998 the first permanent Internet connection was established using a satellite operating via the Philippines. Not until 1999, the Lao National Internet Committee (LaNIC) awarded ISP licenses to GlobeNet and PlaNet. Still, this service was limited to only a few dial-up customers due to a lack of telephone lines. In 2002, the PlaNet launched a full dial-up service. The late introduction of the Internet is partly due to skepticism from the government related to the potential destabilizing influence the Internet might have. Taken together with the prevalent suspicious attitude, the country faces great barriers in Internet access and use (Minges and Gray 2002).

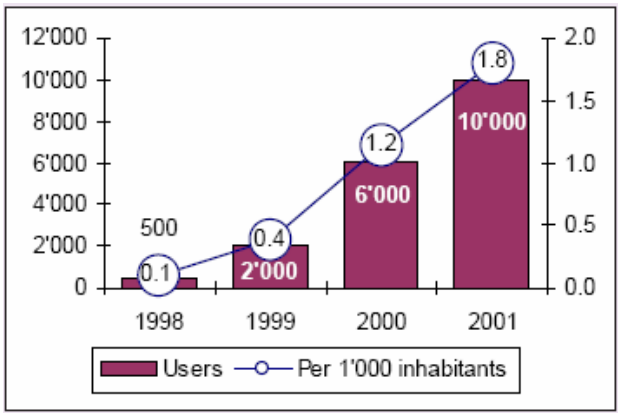


Table 3: Internet users in the Lao PDR pr 1000 inhabitants (Minges and Gray 2002)

Use of the Internet has grown rapidly according to the International Telecommunication Union (ITU). They indicate that in 1998 there were 0.1 Internet users pr 10 000 people. In 2001 the number has increased to 1.8 users and in 2002 there was 2.7 Internet users per 10 000 (see Table 3) (Minges and Gray 2002).

There exist four ISPs in the Lao PDR: STEA (governmental), LaoTel, GlobeNet and PlaNet Online. Together they service a total of 2,900 subscribers, with LaoTel being the largest, controlling about three quarters of the market. LaoTel has a major advantage over the other providers since it is the only telecommunications service provider. This position gives power to provide or deny the other ISPs with the necessary operating infrastructure. Because of low infrastructure, LaoTel does not have the capacity to offer everyone a line. For the ones who do have access to the Internet, the lines can be slow and they experience break downs. In 2002, it was estimated to be about 60 operative Internet cafes, 45 of them situated in Vientiane (Minges and Gray 2002).

The ITU identifies the main barriers for Internet use in the Lao PDR to be:

- lack of overall Master ICT plan,
- low income,
- poor rates of illiteracy and educational attainment,
- lack of infrastructure, and
- shortage of Lao content (Minges and Gray 2002).

Despite these barriers there is a growing interest in the Internet. There might be several reasons for this. Before the National University of Laos (NUOL) opened in 1996 most students at college level studied abroad. Still, there are only a few courses offered beyond the Bachelor level and therefore students working on a Master's degree study abroad on scholarships. While abroad, many of the students have been introduced to the Internet and wish to maintain contact with the world after finishing the studies. Another factor is that the Lao capital is close to the Thai border and is influenced by television advertisements of the Internet. Finally, the growing number of Internet cafés in urban centers provides people easy access to the Internet. Initially, Internet cafés targeted tourists, but now they are increasingly attracting Lao people. Entering the ASEAN has given the Internet a boost by the member countries encouraging the government to enhance Internet access.

According to the "Reporters without borders," the regime in the Lao PDR does not "allow a free media or permit new information technology to be used to spread democracy" (RSF 2004). Further they state that people often complaint about missing e-mails. The authorities may have changed the content for the e-mails received, since Laotians must provide their passwords when they open an account with a Lao ISP (RSF 2004).

2.12.5 Poverty

Being classified as a Least Developed Country by the UN implies that many inhabitants do not get their basic human needs covered. In 2003, it was estimated that 26% of the population live on less than 1 USD per day. There are signs showing that poverty levels have been dropping, but poverty is still a widespread problem, especially in rural areas and in the Northern provinces. In 2002, only 53% of the Lao inhabitants have access to potable drinking water (UNDAF 2002).

2.12.6 Foreign aid

Official Development Assistance (ODA) plays a central role in the Lao economy. In 1999/2000 the country received a total of 359.2 million USD. As illustrated in Table 4, the ODA has been heavily concentrated in the field of transport and energy, receiving more than one third of the total disbursement. Social development ranks as the area with third most support. Please see the table following for a schematic presentation of ODA to the Lao PDR.

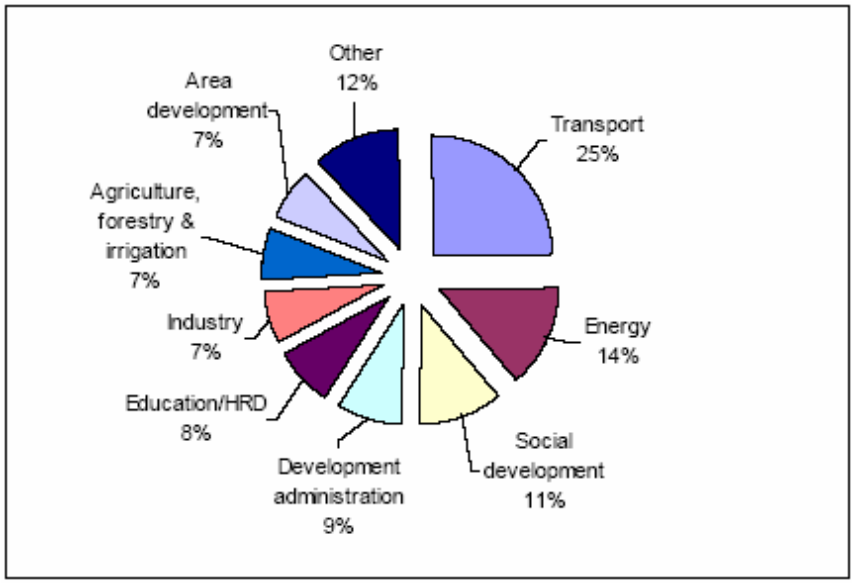


Table 4: Foreign aid to the Lao PDR divided by sector (UNDAF 2002)

2.12.7 Economy

The Lao economy is mainly based on agriculture, employing more than half of the population and generating about 50 percent of the Gross Domestic Product (GDP), which indicates a country's living standard. The GDP purchasing power was estimated to be $1,700 in 2003 (CIA 2004). This ranks the Lao PDR at 135 out of 175 on the human development GDP index. GDP together with life longevity and knowledge are the three indicators to measure human development.

In 2002, The Lao PDR was rated 140th out of 174 on the Human Development Index. With this ranking the country is categorized as having low level of human development (UNDAF 2002), (UNDP(I) 2004).

2.12.8 The UN in the Lao PDR

The UN assists the Lao PDR in four major areas. These areas are defined as the results of extensive collaboration with the country based on its needs. This country-based process involving the UN and the Lao PDR is referred to as CCA, Common Country Assessment.

- Development and poverty eradication policies and strategies
- Response to basic human needs
- Sustainable use of natural resources and preservation of cultural heritage
- Human rights, gender equality and good governance (UNDAF 2002).

Work within the listed areas is guided by the UN's principles, the Millennium Development Goals and by the national development needs and priorities. To specify the issues within each area, targets are defined. Within the fourth area of human rights, gender equality and good governance, emphasis is placed on using ICT. The defining goal is to improve the collection, analysis and dissemination of data, information and knowledge.

The Lao PDR's overarching goal for development is "to graduate from the ranks of LDC by the year 2020" (UNDAF 2002: 24). This will be achieved through sustainable and equitable development. In addition to the main goal there is defined several sub goals, one of them including ICT. The government sees the importance of bridging the digital divide and use ICTs for capacity building and human resource development. Achieving this goal will strengthen the fundamentals of the Lao economy.

The government has defined a set of national development goals to control and foster development. Reaching the main development goals will be achieved through:

- regionalization, internationalization and globalization,
- ICT, and
- macroeconomic priorities (UNDAF 2002).

The government has since 1975 strived at stabilizing the country and fostering economic growth. Providing a framework for this a national development policy was designed with a step-by step basis. The leading idea has been that through small steps the changes that occur will not be counter productive or disruptive to the society.

Three stages have been followed, starting with establishment and implementation of the New Economic Mechanisms. The second stage, structural transformation and capacity building of the economy, has been driven by the idea of going from a land locked country to a land linked country. The final stage is people-centered and sustainable development.

Within the period of 2002-2006 the overarching goal for UN in the Lao PDR is:

> "to provide support to the national development needs and priorities, and promote the implementation of the declarations and programs of action of the world conferences and international conventions, including the human rights instruments, to which the Lao PDR is a State party" (UNDAF 2002: 15).

2.13 Chapter summary

In this chapter a theoretical framework for the research area is provided. The United Nations is presented including the Millennium Goals for Development. The eighth goal targets ICT as a means for development. Furthermore the most prevailing issues within ICT for development are discussed. The main areas presented are ICTs in education, health, farming and government. When introducing ICT to these areas, focus should be placed on giving the users real access. Twelve criteria are defined to ensure this. A selection from the twelve is provided including physical access, affordability, economy, local content, and human capital. These are considered important factors for successful and sustainable projects. Finally, the Lao PDR is presented and defended as the chosen country for field study.

3 Methodology

This chapter presents important issues concerning perspectives, methods and objectives in research. It includes the project's research question, and discussion of appropriate methodologies and the setting for the research and analysis.

The issues presented in the chapter are:

- the research question,
- the research methodology,
- qualitative methodology,
- interviews,
- proceedings for the research,
- work in the Lao PDR,
- presentation of contacts,
- the interviews and the informants,
- the practical performance of the interviews,
- analyzing the results, and
- the role of the interviewer.

3.1 The research question

What are the current issues and challenges associated with implementing ICT based aid to least developed nations?

Sub questions:

How do high level strategic ICT aid goals get implemented at the field level?

What lessons can be extracted from such a study to provide a conceptual model to improve ICT aid relevance and impact at the field level?

When investigating the research area focus will be given to computer based information and communication technologies (ICTs). Comparing the effects of new and old technologies would be an interesting task but is out of the scope for this project. Old technologies such as radio will in some cases be used as an illustrating example.

The high level community defining strategic goals is represented by the various groupings within the United Nations like the UNDP, UNESCAP and APDIP. Past research within the field will be used to supplement the discussion when needed. This will give a richer and more realistic presentation of the problem area seen from different viewpoints. A field level focus is given to the Lao government, teaching institutions and a donor organization. These will be presented in a later section of this chapter.

3.2 Qualitative and quantitative research methods

Research methodologies include both qualitative and quantitative approaches. Deciding which methodology to choose depends on the problem to be addressed, the data outcome and presentation, and the researcher's role. These issues will be discussed thoroughly in the following section.

Hellevik introduces methodology as a method to solve problems and gain new knowledge. He argues that every method that serves this case can be included in the collection of methods. Collecting data can be done in several different ways. The selection depends on what kind of information is relevant to answer the research question. Studies designed to reveal peoples' attitudes and feelings are referred to as "intensive studies". To gain such knowledge the researcher must look in depth. Performing personal interviews and/or observations can achieve this. Other studies may aim at investigating a large number of topics and be interested in defining the coherence between issues and relationships. Commonly, the approaches to research are divided into two categories; quantitative and qualitative methods (Hellevik 1999).

This chapter discusses qualitative and quantitative research methodologies. They are explained in terms of their differences: generalizing data, validity and reliability.

3.2.1 Quantitative research

In quantitative methods the researcher usually looks at a large selection of respondents. Its goal is to answer a research question that often has connected hypothesis. Using a large selection of respondents is one of the main elements in presenting comprehensive data, this being one of the main features in quantitative research. Besides ensuring a representative sample, the reliability and validity as well as generalization of data must be considered. These are the main characteristics and requirements for quantitative research methodology (Gentikow 2002).

Valid data
Valid data relates to whether or not the data found is appropriate or relevant for answering the research question. Other ways of explaining validity are justness and truthfulness. For data to be of high validity, the reliability must be high (Hellevik 1999).

Reliable data
Reliability means that the data presented are reliable, trustworthy and accurate. As for the research, one must be able to trust that there are no mistakes done in the research. This applies to the analyses and presentation as well as the data collection. Reliability comes from the accuracy in the different operations leading to the final results. To test reliability and validity it is common to repeat the research to check the "stability of observation" (Gentikow 2002: 90).

Generalizing data
In quantitative research one wishes to answer a problem area using a large group of respondents. The broad selection of informants increases the chances that the findings can be

transferred to other groups. From the result in one group one wish to draw general conclusions that apply for others through statistical methods for generalizing.

3.2.2 Qualitative methods

Qualitative research is a "matter of articulating compelling and researchable questions that are salient to one or more audiences" (Lindlof 1995: 63). Of special interest to qualitative research is to understand the values and beliefs people have, seen from their personal and cultural perspective.

Within qualitative research there are usually three kinds of techniques recognized:

- interview,
- observation, and
- document analyses.

(Bruhn Jensen 2002; Patton 2002)

Observation can be very useful to gain knowledge of peoples' behavior and reactions. To reveal peoples attitudes and experiences, interviews can be more applicable.

Ethnography in qualitative research

Interpretative ethnography has contributed to the development of cultural and social studies. Through observing exotic cultures, the ethnographer presents the results of field study by using thick description. The term "thick description" can be defined as dense, compact, detailed and rich description depending on the context of use. The results from an ethnographic study appear as a complex and incomplete text that needs to be interpreted by the researcher. Gentikow suggests that the term "thick description" can be expanded to apply for other social studies. In addition it can include a) the informants own verbal description of the phenomenon, and b) the researcher's contextualized description of the description in a). (Gentikow 2002: 38).

3.2.3 Phases in qualitative research

Like stated introductorily in chapter 1, there are different phases in work of conducting research. Lindlof presents common phases in qualitative research and these are used in this project.

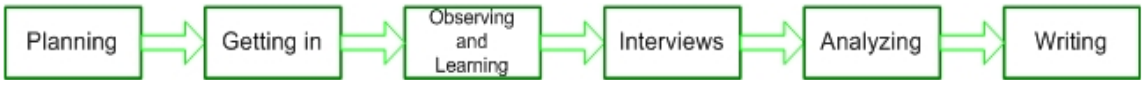


Figure 8: Phases of research

In the phase of planning the researcher gains a better understanding of the topic. The problem is categorized through defining its purpose and means of engaging its subjects. Consulting literature and others engaged in the field of research should be done at this point, together with a feasibility analysis of the economical aspects in conducting the field study. "In terms of the planning phase, this process matures in a written research proposal. As one begins to

contact the scene – to negotiate for access […]- the possibilities of a problem are realized as actual strategies of fieldwork"(Lindlof 1995: 96).

In the "getting in" phase the researcher searches for contacts in the field. Single interviews, diaries and surveys can be useful methods for achieving this. In some cases the ones responsible for this in the chosen organization, institution or country must approve the research. Also, identifying potential sponsors is done in this phase. As a result of the pre-fieldwork activities, the subject is framed as something to be learned about, through questioning and dialogue.

In "observing and learning" it is suggested to use participation observation while invoking text. Different texts can be included, ranging from field notes to documents and visual media. Through learning about the field of research and the contacts the researcher should reflect on its role (Lindlof 1995). This is further elaborated on in the next phase.

When conducting interviews, the work should start by determining an appropriate type of interview. Some of them are presented in section 3.2.5. Further on, the researcher must decide how many interviews to conduct and the length of them. Then the questions can be designed. Finally, conducting interviews calls on the researcher to reflect on the identity that other perceive. This is because "the ways researchers talk, look, introduce themselves, and intervene in people's lives leak signs of cultural capital"(Lindlof 1995: 194). This is further discussed in section 3.8.

The next phase is analyzing results from the interviews. "Analyzing qualitative data is best thought of as a process that is continuous throughout an entire study" (Lindlof 1995: 215). Analyzing results can be done in different ways, often including coding. It is a manner of "hearing the voices of the other and deciding which voices should be included and how these voices are to be stitched together" (Lindlof 1995: 243). How this work is approached in this project is presented in 3.7. The analyses of the results are presented in chapter 4.

There are different times and ways of presenting the text. According to Lindlof the text might be "an account of the researcher's total experience in a culture, or it may be the first of many papers that treat the empirical, conceptual, political, or methodological aspect of the project" (Lindlof 1995: 244). To reveal how this thesis is written, the reader is invited to carry on and explore it personally.

3.2.4 Methodically requirements

Qualitative research has been criticized for not meeting the methodically requirements of validity, reliability and generalization. The main critiques can be summarized in the following point list:

- the results are not representative,
- too few informants,
- too high research flexibility,
- too personal relationship between researcher and informants, and
- manipulative techniques for interviewing (Gentikow 2002).

In this section it will be discussed how the criteria of validity, reliability and generalizing can be met in qualitative research. To assure valid and reliable results the terms must be adjusted to the fit the nature of the methodology.

Validity
Validity in qualitative research cannot be checked in the same way as quantitative research. This is because the research takes place in a certain context that cannot be replicated. Instead Gentikow (2002:89-91) suggests that one should question the truth of observation. Are the questions used well defined so the researchers investigate what is meant to be investigated? Further it is suggested that the validity term must be expanded. The validity should include the interpretive approach used in the research because the goal of qualitative studies is to present valid data to reach - if not *the* truth - then at least plausible interpretations:

> "Qualitative inquires do seek credible, dependable data (…) basically, we want to inspire confidence in readers (and ourselves) that we have achieved right interpretations. Notice that I do not say the right interpretation. There are many possible interpretations of a case. But we stand a better chance of arriving at very plausible interpretations if we can evaluate competing ones incisively"
> (Lindlof 1995: 238)

Reliability
Common for all research, both qualitative and quantitative methods should not misrepresent truth. It is vital for the reliability that both desirable and undesirable findings must be included. The researcher must never be tempted to only include results that confirm the researcher's assumptions (Gentikow 2002).

Normally, to assure that the results found are reliable, the study must be repeated at a different time and by another researcher. This is not possible in qualitative studies. In quantitative research one is concerned of predefined rules for measuring a phenomenon. In qualitative research the researcher is the measuring instrument. Accurate and standard measurements cannot be done. Instead focus is placed on the researcher's judgments and interpretations. And these can and should always be questioned.

The criteria for measuring reliability must be defined to meet the nature of the qualitative approach. Each choice made by the researcher must be questioned. It is important to question critically the choices made and the resulting interpretations. In addition, the researcher must constantly question the research being carried out. Self reflection is an important aspect in qualitative research (Gentikow 2002).

Generalization
Generalization is the criterion that is difficult to meet in qualitative research. Gentikow suggest that the term can be adjusted to transferability. A study can be valued according to whether a study can be transferred to another situation or context. Thagaard also supports this:

> "Transferability has reference to if interpretations based on a individual study also can pass for studies in other contexts" (Thagaard 1998:20 in (Gentikow 2002: 93), writers translation).

Including the term transferability gives that the requirements for generalizing results is met in qualitative research.

3.2.5 Choice of methodology

This research project included a field study. Performing research in a foreign country limits the number of options for choosing methodology. Foreign language, low literacy levels and cultural constraint, the possibilities for data collection and data type is reduced. When planning field study in a developing country all of these issues must be taken into account. If there are high illiteracy levels in the country, all forms of written methods should be excluded. The interview subjects must also be taken into account. If they are high ranking officers, language and literacy levels might not be an issue.

In some cases limited language skills makes written data collection problematic. This relates both to written local language skills and English language skills. In cases where an interpreter is needed, or translation of the results must be done, another factor to the reliability of the results is added. Translating from one language to another may give different cultural interpretations that change the true meaning of the data.

Research within the UN and other organization involved in fieldwork in foreign countries follow different research methodologies. Reports are often written based on document analyses and statistics. Grass root research depends on the research methods given in the chosen research methodology. Qualitative data add valuable information to the high level reports. One study using qualitative research is the UNDP/UNV's "E-Readiness Assessment in the Lao PDR" (Chansavat and Sayo 2000). Another example is the report "Information and Communication Technologies for Poverty Alleviation", by Roger W. Harries (Harris 2004).

The nature of the research question and the context of the research are decisive for choosing methodology. Based on this, qualitative research methodology was found to be the best approach. Interviews were used as the main technique for collecting data. In addition, observational notes were taken during and after the meetings and interviews, and will supplement the data collection.

3.2.6 Interviews

At its best, the "qualitative interview creates an event in which one person (the interviewer) encourages another person to articulate interests of experiences freely"(Lindlof 1995: 163). The most commonly used types of interviews in qualitative research are known as in-depth, informal, unstructured, and semi-structured. One of the main distinctions between structured and unstructured interviews lies in the researcher's role. In structured interviews the researcher has a high level of control using predefined questions. Unstructured interviews can take form like a regular conversation. Another distinction between unstructured and structured interviews can be found in how the data is analyzed. In structured interviews quantitative methods are often used (Lindlof 1995).

Patton describes different types of questions used in interviews:

- Experience/Behavior Questions
- Opinion/Values Questions
- Feeling Question
- Knowledge Questions
- Sensory Questions
- Background/Demographic Questions (Patton 2002).

The different question types can all be asked in different times - past, present and future-, providing a set of eighteen different question types.

Semi-structured interviews
Semi-structured interviews apply techniques from both structured and focused interviews. Normally, the questions are specified but need not be followed strictly. This leaves the researcher to decide how the interviews are executed. One of the challenges a researcher faces when doing interviews is structure. Planning and administrating the interviews as well as pre-structuring the interaction is a challenging and necessary part of the research (Bruhn Jensen 2002).

When performing semi-structured interviews an interview guide is often designed. This can function as a checklist for the interviewer to ensure that the desired topics are covered and the same topics are covered in all the interviews. In most semi-structured interviews a combination of structured and unstructured questions are common. Typically, questions like age, sex and occupation are often structured. This gives the researcher data that permit comparability among the interview subjects. It also allows the researcher to categorize the interview subjects for comparison.

When carrying out the project, two approaches were taken. First, a literature review of reports and research in the field was done. This work was focused on the United Nations and other similar international organizations. Documents included were development plans and reports, guidelines, declarations and visions. Macro level information like this provides important background information for further discussion of issues concerning ICT and development. In addition to this work, the background information was addressed at micro level while performing fieldwork in the Lao PDR.

In this research project, semi-structured interviews were chosen as the main approach. This provides the best methodology when doing research in a developing county with low literacy rates as well as relative low English skills. The interviews were designed to include different types of questions and approaches. Two different interview guides or sets of questions were designed to meet the different informant groups. The guide functioned as a starting point for further discussion. The questions used in the interview will be presented in a later section of this chapter.

3.2.7 Critical conditions for successful interviews

Channell and Kahn advocate three critical conditions for successful interviews. The first condition is accessibility and refers to whether the interview object has access to information to answer the questions. The second condition relates to cognition. The interviewee needs to understand his or her role. The final condition is motivation. For successful performance and results it is vital that the interviewer gives the interviewee an impression of being important for the project and that their contribution is valuable (May 1997).

3.3 Proceedings for the research

In chapter 2, the most important country criteria were presented. These were used as a basis for deciding on a country to perform field study in. The Lao PDR met the criteria and was chosen. Another factor making the country interesting is that it is a "forgotten" country. Next to nothing is presented in the media from this country. Many people think that it is a city in its neighboring countries Vietnam or Thailand. Further study of the country showed that its social and economic situation fulfilled the criteria for carrying out the field study.

Process of finding contacts
To go through with the field study, getting in contact with the right people to cooperate with in the Lao PDR was vital. This work is part of the second phase presented in section 3.2.3. Approaching this task could be done in different ways. The chosen strategy was to take a broad perspective. Following this strategy, a wide variety and large number of people were contacted starting at top-level. The request was formulated in a flexible way so the field study could be adjusted to the potential contacts (see Figure 9 for a copy of the e-mail).

To whom it may concern,
My name is Ms. Synneve Monstad, and I am a graduate student at the Department of Information Science at the University of Bergen, Norway.
I will be going to Vientiane, Laos in September and stay there for 2-3 months, and I am looking at the possibilities to do research for my thesis there.

Very helpful for me, is to establish contact with organizations in Laos who are involved in the issues of introducing new technologies to the country, or have an interest in this. The methodically framework is to do personal interviews and I am also looking for people who are willing to be interviewed. I am aware of that the time I have to establish contact is running out, and I appreciate if you can reply to me soon.
My research project will address the challenges and opportunities of introducing new technology, mainly computer based technology, to a developing country. The plan for my thesis is to do research at different levels being;

1) locals, those who may get influenced by use of new technology, and
2) people responsible for introducing new technology

My supervisor Konrad Morgan (Konrad.Morgan@ifi.uib.no) is also involved in research within the same issue, and if you have any queries regarding my work feel free to contact him.
If you could provide me with any advice in my research, I will be most grateful, and if you know of others this is relevant for, please forward this e-mail.

Sincerely,
Ms. Synneve Monstad
synneve.monstad@ifi.uib.no

Figure 9: Request e-mail

Because the theoretical framework for the thesis involved the UN they were the first organization contacted. To work directly with them in the Lao PDR was desirable. An ideal situation would be to travel with the UN and interview the receivers of UN assistance.

First, the UN organization, UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific), with their headquarters in Bangkok was contacted. They recommended contacting another UN office located in India, which are active in projects including ICT and development. After several e-mails were sent without response, they were called up by telephone. Unfortunately they could not provide any help in this project.

After this, the UNESCAP was contacted again with a new request for help. Ms. Rankine was very helpful and e-mailed a list of 12 scanned visiting cards from various businesses and agencies within the private and public sector in the Lao PDR (see Figure 10).

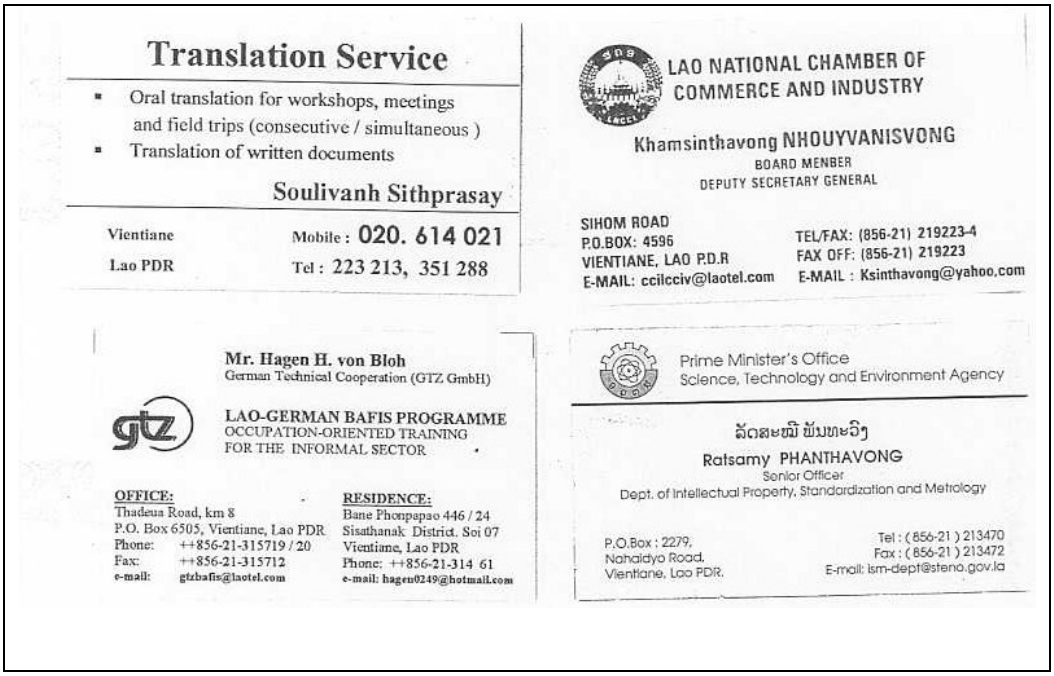


Figure 10: Part of the list of visiting cards given by the UNESCAP

The next step was to contact the people on the list. E-mails were sent to all of them but without response. This was partly due to wrong or replaced e-mail addresses. Another attempt was made, this time by faxes. This also did not provide positive results.

The problems getting in contact with people in the Lao PDR made the researcher reflect over possible reasons for this. There might be several reasons for why the respondents did not reply. First, the e-mail might not have reached the recipients. One reason might be that the addresses were not in use. Second, the receivers might have low levels of English language skills. The request might have been written in a too formal way making it difficult for the receivers to understand the message. Some of the responses that were given showed poor English writing skills. If language was the barrier, responding to the request was most likely seen as an effort. During the process of finding contacts, the requests were re-formulated to be less formal. Third, the majority of people contacted were high ranking people living busy lives. They simply might not have the time to respond and/or provide help. Finally, the receivers might not be directly involved in the project area or see the importance of the projects.

Another suggestion from Ms. Rankine at the UNESCAP was to contact the UN Resident Coordinators Office in the Lao PDR. This was done, with referring to the UNESCAP. Again, there was no positive response. However, they apologized for not having the time and resources to provide any help.

Since the contact with the UN did not give positive results, the World Wide Web was explored. Keywords used for searching were:

ICT, IT, development, poverty, Laos, the Lao PDR, LDC, UN, MDG, UNDP, APDIP.

Searching the Web gave an overview of the activities in this field. People or organizations with a link to ICT and/or the Lao PDR were contacted. Presented below is a list of some of the ones contacted. In addition, request was sent to people without any obvious organizational affiliation.

- The UN in Bangkok
- Resident coordinators office in the Lao PDR
- Christian Michelsen Institute (CMI)
- CROP, Comparative Research on Poverty
- Rokkan Centre, University of Bergen
- Institute of Social Anthropology, University of Bergen
- Norwegian Foreign Affairs
- Norwegian Church Aid
- Nordic Institute for Asian Studies (NIAS)
- NORAD
- Norwegian Research Counsel
- Schools Online
- IBM
- International Telecommunication Union
- ASEAN
- Information Technology and Management Practices for Development.

In this work it was a challenge to find people actually located in the Lao PDR. A likely reason for this is that the country has a low level of information on the Web. This was also the case for the Lao Government and various departments. For the people found, the e-mail addresses were in many cases inoperative.

First contact

Through exploring the Web the Schools Online were found. They were involved in introducing Internet to schools in the Lao PDR. They were contacted and they replied, suggesting sending a request to their collaborative partners, The Jhai Foundation. After this the founder of the organization, Mr. Lee Thorn in the USA was contacted. He had a very positive response the project and forwarded his reply to the Lao country coordinator, Mr. Vorasone. He was willing to provide help when the researcher was located in the Lao PDR. After this, frequent contact was held by e-mail until the researcher arrived in the country. Then telephone contact was made.

Second contact
Continuing to find other contacts, an e-mail was sent to the Association of South East Nations (ASEAN). Ms. Posadas at the Indonesian office returned a list of contact information for four government workers in the Lao PDR.

One of the four persons replied and offered to help. This was Mr. Sourioudong at the Science, Technology and Environment Agency, STEA. After corresponding and receiving a formal invitation, the researcher and supervisor saw it as necessary to specify the context of the project. The fieldwork was part of a Master degree thesis and was not part of any large project with financial resources. This was important to clarify before any misleading assumptions were made that the cooperation would pay off economically. Finally, after much effort done to find contacts in the Lao PDR, two people promised to help. These were Mr. Sourioudong at STEA and Mr. Vorasone at the Jhai Foundation.

3.3.1 Visa
There are different methods to obtain a visa to the Lao PDR. One way to get a visa is buying a tourist visa when entering the country. This type of visa lasts for 15 days. After that it can be renewed twice each time for 15 days. When the three renewals are used, the visitor has to leave the country. When entering again, three renewals can be made once more. The other way to obtain a visa is applying through a Lao Embassy. Because the purpose of the visit was to do fieldwork, the researcher felt it was more ethically correct to apply for visa formally through the Lao Embassy in Sweden.

3.3.2 Research permission
At a meeting with a professor at the Institute of Social Anthropology at the University of Bergen, the need to have permission to do research in the Lao PDR came up. Effort was made to find out whether permission was needed, and if so, how to apply. The foreign affairs in Norway were contacted as well as the Norwegian Embassy in Vietnam. None of them were able to verify if permission was needed and it was suggested to contact the Lao Embassy in Sweden. Contact was made and they clarified that permission would not be needed. A Lao government worker confirmed this during the field study.

3.3.3 Reward for participating in research
It was discussed whether the informants should be rewarded for participating in the project. The researcher felt it was important to show them that their efforts were appreciated. Still, this should not be the motivation for participating. Gentikow (2002:65-66), discusses the use of rewards for participating in research. Payments or other advantages might be interpreted as bribes that make the informants too positive minded. Further, being aware of this factor is important and should be included in the final report.

The supervisor, Konrad Morgan, suggested inviting the contacts to a meal after finishing the interviews. This way they were not aware of the treat when participating and still the researcher got the chance to thank them for their help. Also it was thought that bringing them something from Norway would be appreciated. Contact was made with the University of Bergen and their bookstore *Studia* sponsored a bag of pens and five t-shirts with the University logo to give to those involved in the field studies.

3.3.4 Work in the Lao PDR

After arriving in the Lao PDR September 20th, 2003, Mr. Sourioudong and Mr. Vorasone were contacted by telephone. Meetings were carried out with both of them. During the first meeting with Mr. Sourioudong on October 6th, 2003, it became clear that his field of work was concentrated within biotechnology and environmental issues. This was not directly related to the research project and the researcher felt it necessary to look for other contacts. Mr. Sourioudong was still interested in providing assistance and was in return hoping to receive help to design the department's web site. Other departments within the agency were studied closely and called up. At the Science and Technology Department, Ms. Sisavanh, Deputy Director General, was willing to provide help in the project. At the first meeting it was revealed that she was one of the four persons contacted earlier. The first meeting was held October 9th, 2003, and Ms. Sisavanh was willing to provide help in the research project. She also provided a list of other people useful for the project within STEA and at the National University of Laos.

Several meetings were held with Mr. Vorasone at his office. At the first meeting (October 7th, 2003), it was revealed that the "Remote IT Village Project" was not operating. This project was one of the two that were interesting to look closer at. Several meetings were held with Mr. Vorasone before an extensive interview was given.

3.4 Presentation of the contacts

3.4.1 Science, Technology and Environment Agency (STEA)

The STEA is a governmental agency placed under the Prime Minister's Office in the Lao PDR. In 1996 they were given the responsibility to "implement the overall policy for monitoring and controlling Information Technology in the Lao PDR"
(Chansavat and Sayo 2000: 6).

STEA is also responsible for the action plans and research within the fields of science and technology, property, standardization and metrology and environment. These fields build up the three departments. In addition, the STEA has three research institutes. See Figure 11 for a schematic chart of the organization.

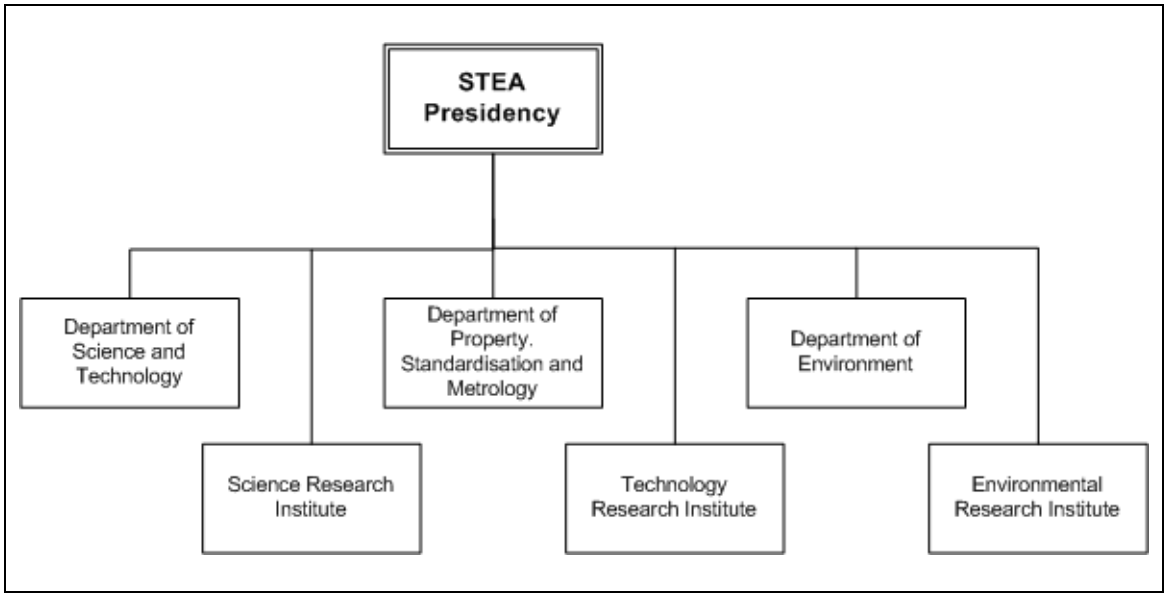


Figure 11: Organization of STEA (STEA 2002)

At STEA, the main contact person is Ms. Sisavanh, Deputy Director General of Science and Technology Department. Her main activities are related to regulations and management of science and technology through drafting of the National Science and Technology Policy (Ms. Sisavanh, STEA).

Besides Ms. Sisavanh, another STEA employee, Mr. Keonahkone, was interviewed. He attended the first meeting with Ms. Sisavanh and was later contacted by e-mail. His responsibility lies in drafting the National E-strategy and E-governance Plan, being most involved in the former. The e-strategy plan includes a wide specter of areas from human resource development to legal framework. The different elements in the E-strategy plan are presented in Figure 12.

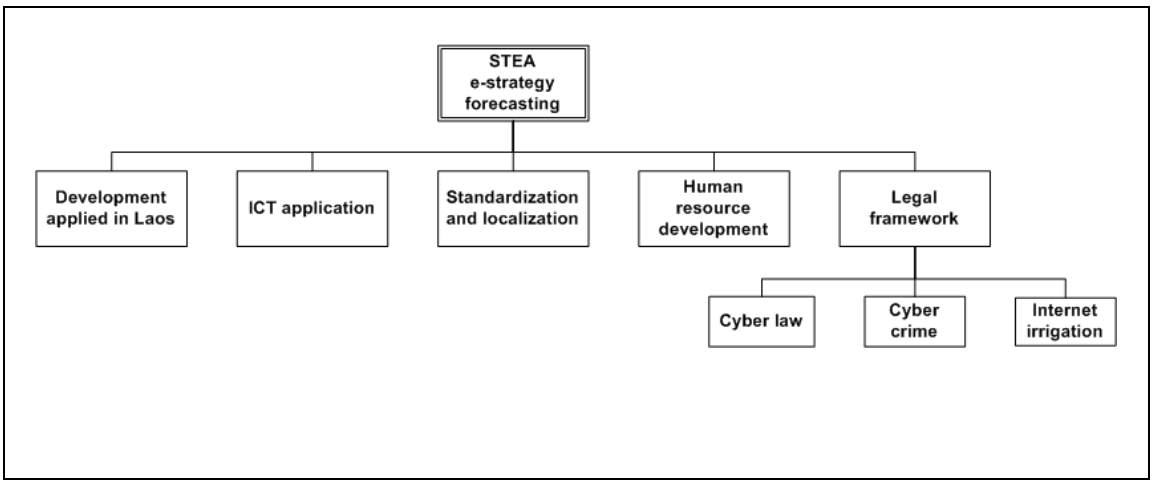


Figure 12: E-strategy plan for STEA (Mr. Keonahkone, STEA)

3.4.2 The Jhai Foundation

The Jhai Foundation was started by Mr. Thorn, and is co-founded by a Lao refugee, Ms. Bounthanh. During the Vietnam War, Mr. Thorn served his duty as a bomb loader. This was the motivating factor for starting the reconciliation projects in the Lao PDR. Since 1998 their projects have been carried out in the Lao PDR. "Jhai" is a Lao word meaning "hearts and hands working together". It is a non-profit private American-Lao donor organization (Jhai 2004).

The projects aim at improving social and economic development in the Lao PDR. The main area they work in is wiring the country to the Internet. Through the Internet Learning Centers and the Remote IT village project, access and training is provided to students and to the other villagers. Having access to ICTs helps the farmers coordinate their seeding and harvesting. This has increased their profits. In addition to this, the Internet gives them access to new markets where handicrafts can be sold. Besides being involved in introducing ICT to the Lao PDR, the Jhai has projects within health care, building infrastructure and coffee production.

Mr. Vorasone is the country coordinator for the Jhai Foundation and has been the main contact for the research project. He studied abroad in the 80`s and was the first Lao graduate student in computer science, and is regarded as one of the most knowledgeable persons within IT in the country. As a former employee at the National University of Laos, he was responsible for the first computer classes that were offered. Since 1999, he has worked for the Jhai Foundation. At the meetings he gave valuable information about the projects they are involved in. Also, he arranged for visiting the Internet Learning Centers and invited the researcher to visit the village of the Remote IT Village project.

Of the work the Jhai Foundation is involved in, the Remote IT Village Project and the Internet Learning Centers are of special interest to the thesis and the field study. Both these projects aim at improving living conditions for Lao people through the use of computer-based technology for information and communication.

The Remote IT Village Project

The village Phon Kam is the first of the five villages to be included in the Remote IT Village Project. They all belong to the Hin Heup district about 2 hours by car from the capitol Vientiane. The main employment in the district is farming.

The Lao PDR, being a Least Developed Country, displayed poverty as especially conspicuous in the rural parts of the country. This is also the situation in Phon Kam. They are generally very poor and they lack access to electricity or telephone communication. In the village they have a few diesel driven motors that provide small amounts of electricity. Spread throughout the village are four wells provided by the Jhai Foundation.

Picture 4: Phon Kam children playing at the well given by the Jhai Foundation

When initiating the project the villagers were asked what they needed. The answers given were electricity, better roads and ways to communicate with people in nearby villages as well as relatives in foreign countries. Of these wishes, the latter was the area the Jhai Foundation could provide help. The others were too expensive for the foundation to be responsible for (Mr. Vorasone, Jhai).

Based on the village's needs the Remote IT Village Project was started. The goal of the project is to connect villages that lack basic infrastructure, especially electricity and telephone lines. Without communication infrastructure the village has no other means of communication. Because of the mountainous landscape, mobile phones cannot be used. To provide them with a way of communicating they developed a computer specially designed to fit the needs of the village.

The Jhai PC

As mentioned earlier, the village of Phon Kam lacks both electricity and telephone connection. Wanting to provide the villagers with means for communication, they were forced to think untraditionally. Without the necessary infrastructure, as well as low-literate users without English skills, challenged the development. The result was a specially made computer named the Jhai PC. To meet the harsh conditions the PC is build to operate in extreme humidity and is resistant to water. To meet the electricity needs, the computer runs on car batteries charged by bicycle cranks. In normal use, the computer draws less than 20 watts (Jhai 2004).

Picture 5: Car batteries used for power

Connection to other computers can be done by radio local area network (LAN). An antenna is placed on the roof and sends signals to a nearby mountain. On the top of a mountain the highest tree is equipped with antennas to receive the signals from the village and forwards them to the closest village with telephone lines (see Picture 7).

Picture 6: Mr. Vorasone demonstrating the Jhai bike

Picture 7: Tree with antennas (Jhai 2004)

Once the technology challenges are met, the villages have means for information and communication through e-mail and the Internet. In addition, to specially design the PC to the needs in Phon Kam, the developers also considered the language skills of the villagers. They developed a Lao language version of the KDE graphical desktop from Linux. Office tools were also translated to Lao language (Jhai 2004).

The Jhai PC with specially developed hardware and software can benefit the villagers in different ways. For the first time they have means for communicating with people elsewhere. This can be done through Internet calling using voice-over-Internet technologies or through e-mail. Also, they have office tools to support enterprises.

Phon Kam is the first village to test this equipment. After months of testing and adjusting the equipment, the military denied its continued use. It turned out that the mountain were they had placed the tree with an antenna was within military property (see Picture 7).

The special made equipment, computer and the wireless technology is tested and works but has never been used by the local people. In December 2003, the Jhai Foundation is still waiting for the Ministry of Defense to give their final ruling.

While waiting for the final decision, the equipment was moved from Phon Kam to Vientiane. From here they shipped the computer to the U.S. for upgrading. For a more detailed description of the technical aspects of the Jhai PC, please see the Jhai Foundation's web site, www.Jhai.org.

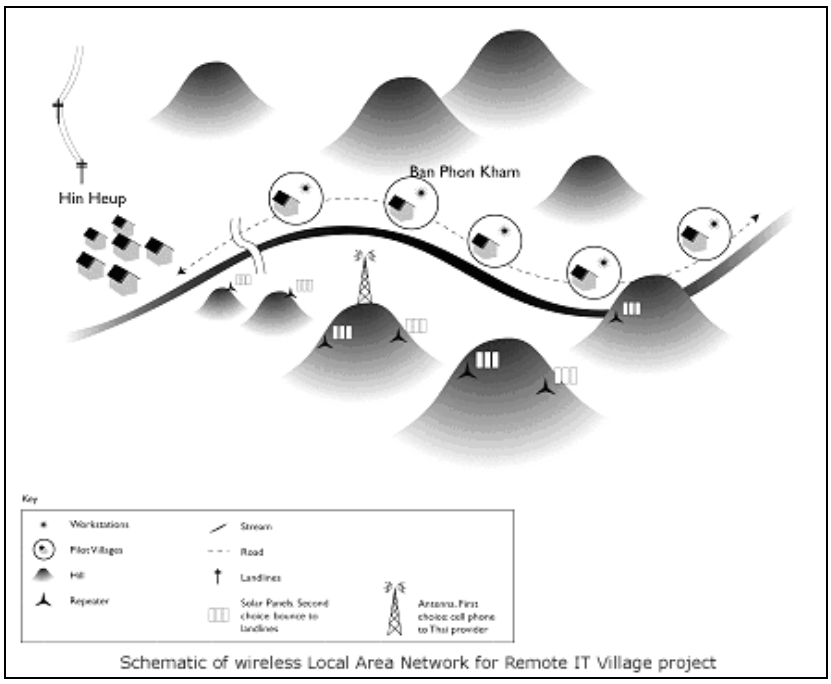


Figure 13: Drawing of the Jhai PC connection route (Jhai 2004)

Visit to Phon Kam Saturday October 25th 2003

On the day of the excursion to Phon Kam, there was a wedding. Mr. Vorasone invited the researcher to the wedding. To join the party and be part of this cultural experience was a good reason to go that day. Talking with people and experiencing more of the Lao culture was possible since the wedding party included the whole village.

Picture 8: Villagers of Phon Kam

When talking with villagers of Phon Kam, they expressed that their greatest wish was to get electricity. Electricity lines go through the village from Hin Heup (6 km from Phon Kam) but these lines provide 22-kilo voltage electricity. Private use can handle only 230 voltages, so a transformer is needed. The required transformer is expensive and the government cannot or will not provide it. In the Lao PDR there is one electricity company, The Electricitie Du Laos (EDL) that is run by the government. To get access to electricity in rural areas is a long

process and is based on the help the local people provide. They trade forest and labor for electricity infrastructure. Early 2003 they started the work building the poles and putting up the cables. Getting this far has taken them seven years. When the village people put in more communal work the village might get the transformer they need (Mr. Vorasone and (Jhai 2004)).

When visiting the village, the schoolhouse and the computer room were looked at. Until the project can be re-started the room is used for storage. The bicycle and the car batteries were studied closer at the Jhai Foundation's office in Vientiane.

Internet Learning Centers (ILC)
The Jhai Foundation has together with Schools Online supported four high schools across the country with Internet Learning Centers. Two out of the four high schools were visited during the field study, Vientiane High School and Phon Mi High School. These particular two were chosen because they were easy access from the capitol. Also, one being centrally located in the capitol and the other in a rural village adds a great possibility for comparing the students' use of computers and Internet based on location.

Vientiane High School, October 27th, 2003
Vientiane High School is the largest school in the capitol and is located centrally in the city. Because of its location and the high quality education given there, it is regarded a high status school. The total number of students is about 4000 and their age ranges from 15-18 years old. The entrance requirements are based on tests of the students. After finishing three years at Vientiane the students receive valuable certificates.

The school received an Internet Learning Center three years ago, in year 2000. The school is not able to offer all of the students computer training. About 50 students from the fifth level are selected for the courses that are 10 hours pr week. In total they receive 190 hours of computer training. In addition to the computers at the ILC, they have two other computer rooms, each with 20 computers, given by the Koreas aid, KOICA. These computers are not connected to the Internet and are used mainly for training in Word and Excel. Divided in three different rooms the total number of computers at Vientiane High School is 50. Having this many computers at a high school is rare in the Lao PDR. Most high schools do not have computers at all. Still, 50 computers to train 4000 students is not a favorable situation.

The Jhai Foundation supported the Internet Learning Center it's first two years with practical and financial help. From 2003, the teachers have taken over the responsibility. Their income comes from students who wish to use the computers for playing computer games or for Internet. For this they pay a small fee. This income is not enough to cover the expenses they have for paper, printer ink and Internet fees. The remaining expenses are covered by the High School. Vientiane, being a medium sized city, has many Internet cafés and people are generally speaking wealthier. Several of the students have computer and Internet at home, and if not, many use Internet cafés. This might be one of the reasons for the Center's low income.

Phon Mi High School, November 18th, 2003
Phon Mi High School is located in the rural village Phon Mi, 1.5 hour from the capitol Vientiane. It is a small village and the most of the villagers are farmers. Phon Mi High School is the biggest school in the province and is managed by the Ministry of Education. Pupils come here from the surrounding villages. It is a popular school because of its central location

in Phon Mi. The school also has a good reputation partly because of the computer room. There are 1640 students from 15 to 18 years old attending the school. This school was the first Internet Learning Center given by the Jhai Foundation. During the initialization of the project the staff received two months training from Jhai Foundation. The training was on basic computer use with emphasis on Microsoft Word and Excel. They also had one day of Internet and e-mail training.

Picture 9: Internet Learning Center at Phon Mi High School

The Internet Learning Center has been successful and it has been handed over to the school and is run by the teachers. The Internet Learning Center at Phon Mi has three main goals:

- to be a center where students at the school can receive basic training in Microsoft, Word and Excel and introduction to e-mail and Internet,
- to be open to the public in terms of courses and pay-Internet, and
- to be a business project to teach the teachers economic and planning skills.

During lunch break and afternoons the ILC is open to the public. Twice a week the teachers offer training courses in Internet use, Word and Excel to villagers. This Center has given many rural people access to the Internet and computers that they usually would not have access to. The small fee they pay for courses and Internet use helps run the center.

3.4.3 National University of Laos October 16th 2003

The contact person at the National University of Laos (NUOL) was Mr. Phonekeo within the research promotion and cooperation division. Ms. Sisavanh at the STEA recommended him and contact was made. After that a meeting was scheduled and carried out.

The National University was united in 1996 and is located at different campuses; the main one being Dong Dok Campus located 20 km north of the city. Students attend the university for 5 years to graduate with a Bachelors degree. The first two years are general introduction courses and the last three years the students specialize. At the faculty of science there are four departments: physics, biology, chemistry and math and computer science. Fall 2003, the

NUOL had no separate program for computer science. The curriculum is divided in 60% to mathematics, and 40% to computer science. Within this Bachelors program there are 50 students enrolled annually.

Picture 10: Dong Dok Campus, NUOL

Mr. Phonekeo is head of the division for research promotion and cooperation. His responsibilities lie in introducing new research methods and advising the teachers. With a Ph.D. from Japan within semi conduct he was not able to find employment in the Lao PDR within his field of study. Together with a high level of patriotism he chose to accept the job as research promoter at the National University of Laos.

During the visit he gave a tour of the campus to see the IT Center and the faculty of science. Here Asst. Prof Mr. Oudone and Mr. Bounthong were visited and short interviews were carried out with them. At the faculty of science there is one computer lab with 20 computers connected to the Internet. These are used for the computer classes. The IT Center was just finished and was to open late fall 2003. It will serve as a training center for staff as well as students at the University. In the future the NUOL is planning on building a new Internet center with 100 computers for the students to use. For this to start they need sponsors that are willing to finance the center.

Picture 11: Computer science at the NUOL

Mr. Phonekeo (right) and Mr. Bounthong (left)

3.4.4 Summary of the contacts in the Lao PDR

Different institutions were looked at when performing fieldwork in the Lao PDR. First the government agency, the Science, Technology and Environment Agency (STEA) was studied. Then a private non-profit organization, the Jhai Foundation, was looked at. Finally, attention was given to educational institutions at different levels, University and High School. By doing so, valuable information about people's beliefs and opinions was gathered and discussed. These three groups represent the data collection from the Lao PDR.

The data collection in the Lao PDR was based on 25 interviews carried out with:

- STEA (2)
- National University of Laos (3)
- Vientiane High School (2 teachers, 9 students)
- Phon Mi High School (2 teachers, 6 students)
- The Jhai Foundation (1)

The UN in the Lao PDR was contacted once more, this time by telephone. They still did not have time for the project, but they could provide written information from their library.

3.4.5 The Bergen municipality, Norway

In addition to the informants in the Lao PDR, contact was made with Mr. Tuftedal, IT responsible for the Bergen municipality. Adding a contact in Norway was done to gain insight into the ICT priorities and practices found in a developed country. By doing this, the differences that might exist between a developed and developing country can be discussed.

3.5 The interviews and the informants

3.5.1 The interview guide

The questions used in the interviews were defined during the stay in the Lao PDR. For the main contacts, several meetings were held before the interviews were carried out. Based on the information given at the meetings the interview guide could be defined according to general guidelines.

Before every meeting a few questions were prepared to gain a better understanding of the organization. The example below (Figure 14) is taken from the first meeting held in the Lao PDR.

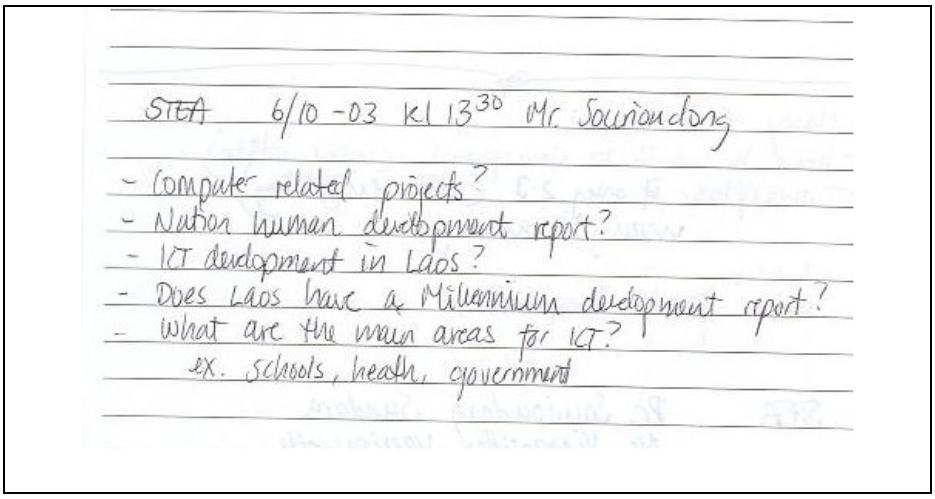


Figure 14: Questions used at meeting with STEA

After meetings with the main contacts, the researcher had gained a better understanding of the research area as well as the organizations the contacts worked at. Based on this, the questions for the interviews could be prepared. Different suggestions were defined and a drafted question set (Figure 15) was e-mailed to the thesis supervisor Konrad Morgan.

- Can you start by telling about your position/work/role here at STEA
- What do you see as the main challenges when working with ICT?
- What do you think can be the solution to these problems/challenges?
- What are the main benefits ICTs give?"
- How do you believe that ICT can benefit the Lao people? (Economically and socially)
- What is done in this field to benefit the rural population?
- By the year of 2020 Laos wants to get out of the category as a "Least Developed Country"
- Do you believe this is realistic
- What is being done to make it happen?
- How do you believe that ICTs can be used to reduce poverty?
- When receiving foreign grant aid, do you at STEA have any policies/requirements/restrictions concerning types of projects, commercial benefits etc.

Figure 15: Draft of interview guide

Konrad Morgan responded to the e-mail approving the questions. In addition he suggested a final question to reveal the respondents long-term perspective.

> "I think your questions sound good - I think you should also ask them what their long term plans will be so you get an idea of their perspective. Ask what their plans are for 12 months, 3 years and 5 years head. Otherwise it sounds excellent" (E-mail from Konrad Morgan October 20th 2003)

The suggestion was taken into account resulting in adding an extra question to the question set.

> *- What are your plans for working with ICT the next year, next five years and the next ten years?*

The result of this work was a set of questions that served as an interview guide to be applied in the interviews. The questions were adjusted to the specific organizations in advance. For example, in the question "what is your position here at STEA", STEA was replaced with Jhai or NUOL. Further discussion of the questions is given later in this section.

3.5.2 The informants

The informants were naturally placed in two groups depending on their role. Questions towards the use of new technology were formulated in two different ways depending on what group the informants belonged to. Group one was people working for the government, educational workers and a donor organization. Questions related to their use and comprehension of ICTs. The other group (2) consisted mainly of high school students. They were asked questions to reveal their use of computers and Internet.

Distinguishing the terms ICT and computers and Internet, was seen as necessary when carrying out the interviews. The students at the high schools would most likely be confused if the term ICT was used. Many of them have only basic English language skills and might not know what is ICT includes. The researcher felt it necessary to present them with more specific information, such as computers and Internet. By doing this misunderstandings could be avoided. For the other informants this distinction was not seen as necessary. This group consists of people who work daily with issues within ICT, either through practical use, or high level ICT planning.

Group 1

The first group of informants consisted of adults employed at the high schools, the University, the government and a private donor organization. They had in common that they had occupations that involved ICT daily. For some of the informants several meetings were held before the interview was carried out. The length of the final interviews were planned to be 20 minutes, but varied some. In the cases where the informant had time and much information to give, the interview lasted longer.

Two of the informants from the National University of Laos were not aware of the interview in advance. The planned interview was with Mr. Phonekeo at the National University of Laos. During the visit, a tour of the campus was completed and two IT workers were visited. They were asked if they could answer some questions. This was no problem for them. The interviews lasted 5-10 minutes in order not to hinder them in their work.

Some of the informants wished to see the questions in advance to prepare for the interview. The researcher didn't see this as a disadvantage and the questions were distributed when requested.

All the interviews with the first group started with the question:

> *"Can you tell about your position or work here at NUOL/STEA/JHAI?"*

Starting with a question that would not require much from the informants was important to help them relax. It was also important for the interviewer to gain further knowledge about the different organizations and the various practices.

After an introduction of his or her work, an informal contact was established and a basis for further questions was created. The following questions were the most important ones covering the interview objects' feelings and experiences towards new technology:

> *"What do you see as the main challenges when working with ICT?"*
> *"What do you think can be the solution to these problems/challenges?"*
> *"What are the main benefits ICTs give?"*

For each informant extra questions were asked when needed. This was important and helpful to gain better understanding of the organizations and the true meanings behind the answers given. This freedom is the main characteristic and advantage of performing semi-structured interviews.

The interviews ended with a question meant to reveal their long-term perspective:

> *"What are your plans for working with ICT the next year, next five years and the next ten years?"*

For a complete overview of the questions used in both groups please see the appendix. There the transcribed results from the interview are presented.

Group 2
Group two consists of students from the two chosen high schools. The total number of students was 15, all of them selected by the teachers. The interviews with the students were short, taking less than five minutes. Planning the interviews to be short was important for interrupting the school day as little as possible.

The first part of the interview was used to get information about the students name, age, rural/urban location and sex. This was done to discuss the group and see if these facts influence the answers given.

The second part of the interview was designed to evaluate the students' use of computers.
Questions used were:

> *"How many hours pr week do you use a computer?"*
> *"What do you use the computer for?" and*
> *"Where do you use computers?"*

The third and final section was about the students' thoughts for the future in proportion to occupation and use of computers. Questions asked were:

"What do you want to do for a living when you grow up?"
"Do you think that computers will be useful then?" and
"How do you think that computers can give people better lives?"

3.6 The practical performance of the interviews

At the first meeting with the informants the reason for being in the Lao PDR and what the information they were giving would be used for it was explained. They were all told that the transcribed information from the interviews would be e-mailed to them before it would be used. This way they had the opportunity to withdraw information and clarify misunderstandings.

During the first meetings with the informants, issues relating to ICT in the country and information about the organization or agency were discussed. Some notes were taken during the meetings, but most of the information given was noted immediately after the meetings. The researcher's perception of the meeting and observations done were also included.

During the interviews a tape recorder was used. In the cases where there was a high level of external noise such as other people talking, air condition and traffic, notes were also taken during the interviews. This was done in case the tapes had too much external noise for the interviews to be heard.

After each interview the results were transcribed. The researcher viewed it as important to transcribe the results as soon as possible after the interviews. By doing so, more information would be remembered, making the transcribing work easier.

Further analyses of the results were postponed until the researcher was back in Norway. There, the resources of both technological and written information were available and the researcher could meet with the supervisor.

After completing the interviews, the remaining time in the Lao PDR was used to confirm that enough information was collected. In this phase the transcribed interviews were sent to the informants as promised. This was done through e-mail for their approval to use the information stated in the transcriptions.

3.7 Analyzing the results

Qualitative analyses reveal what is behind the data gathered and brings into focus the respondents' opinions and motives. When discussing the findings, the informants were separated in two groups, as previously presented.

3.7.1 The matrix

Analyzing the results began by studying the interview transcripts in depth. This process can be described as "coding," where the researcher "creatively scans and samples data-texts, looks for commonalities and differences, and begins to formulate categories of interest" (Lindlof 1995: 224) The result from group 1 is presented in a matrix (Table 5). On the vertical axis the various issues talked about in all the interviews were listed. On the horizontal axis the informants' organization, teaching institution or agency were listed. Every subject or term that was discussed in the interview was listed under "issues in the interviews". These were defined after a brief look through the interviews. After that, the interviews were studied in depth. Whenever the category in the matrix came up, an "x" was placed in the cell where the informant belonged. This categorizing using the matrix illustrated two things. First, it showed what the informants viewed as important within the given context. Second, it illustrated which of the actors were the most active by covering most issues. See Table 5 for a selection of the matrix and appendix for the full version.

Total "X's" on the issue	Issues in the interviews	Actors STEA	JHAI	NUOL
	Number of interviews	2	1	3
2	Lack of English skills	x		x
2	Lao language set and content	x		
1	Lao culture		X	
1	Compatible software and standards	x		
4	Maintenance	x		x
2	Technical problems			

Table 5: Sub-section of the matrix

The matrix can be a helpful tool in the further analyses of the interviews. Still, the accuracy of the table must be questioned. In many cases, for example, infrastructure was discussed without using the specific word infrastructure. Another case important to consider is the researcher's role in the categorizing. Performing semi-structured interviews leave the researcher free to supplement the interviews with new questions. This affects the outcome of the table. The matrix shows only the coarse features of the content in the interviews. Using it as a basis to categorize the results, different structures can be revealed. The matrix indicates whom the most active respondents are by looking at who talks about most of the issues. Also,

the matrix indicates what the informants value as important when discussing ICT for development.

3.7.2 Analyzing the student interviews

As explained earlier, the students were placed in a separate group (group 2) when designing the interview guide. When analyzing the results, this was also a natural thing to do. The interviews with the students were short with other questions than the former group (1). The nature of the questions gave that the results could be analyzed differently. For each student that, for example, used Internet cafés a "I" was added to the matrix. Table 6 shows how this was done. When categorizing the results in this manner the idea is not to make an attempt to include quantitative research methodology. Counting how many students that have computers/Internet at home gives an interesting insight to the real situation for the students. Also, it gives a good starting point for analyzing differences between rural/ urban students. Because of their location the use, awareness and access to ICTs might differ. The results indicate what differences that might exist between the two high schools in terms of their perception and use of the Internet and computers.

		Vientiane High School		Phon Mi High School	
CH	Computers at home	IIIII			
IH	Internet at home	IIII			
IC	Internet cafés	IIII		I	
ILC	Internet Learning Center	I		IIIII	
C	Chat	IIIIII			
	Total number of informants	9		6	
	Informants	5 boys	4 girls	3 boys	3 girls
	Average age	16.33		16.16	

Table 6: Analyzing the student interviews

3.8 The role of the interviewer

Interviews within social science raise important issues to take into account. One of them is the interviewer's role. Is he or she seen as a friend or an impersonal researcher? Does this role affect the answers and how likely is it that the results are controlled? Within both quantitative and qualitative research there is always a possibility that the researcher influences the results.

Another related issue is the characteristics of the interviewer. According to May (1997) characteristics such as age, sex, race, looks and accent can trigger unexpected prejudices and should be considered in advance. Meeting these criteria for likeness is unrealistic. No interviewer will be able to know what unexpected prejudices people have. In many cases the interview objects will not be aware of these issues themselves. Differences between a researcher and the informants can be both positive and negative. In the following section the researcher's role will be looked at including issues within gender, appearance, age, cultural determined factors and finally, language.

3.8.1 Gender and appearance

The interviewer who carried out the project in the Lao PDR was a young female student. This might have influenced the results. The country practices great gender disparities where the majority of educated people and decision makers are men. The awareness of sex related issues were important when meeting with these informants. Perhaps even more important in interviews is the researchers' appearance and manner. This includes outer looks such as clothing, make-up and behavior. Being aware of the cultural ways of dressing and behaving can be very important for the results, because first impressions can be hard to change later on. Consciousness was taken on these issues to minimize the differences and to appear non-provocative. These issues are quite easy to deal with once being aware of them. Other issues such as age, skin color, language and behavior are harder to adjust.

3.8.2 Age

Age is, in many cultures, related to respect and being 25 years old when performing the interviews, might have influenced the respondents' personal perception of the interviewer. This again might influence the results and level of trust given. In some cases, being young some adults may perceive as being unserious and/or without experience. In other cases the respondents may feel that the interview appears less formal and are therefore able to discuss more openly.

3.8.3 Cultural ways of speaking

Every culture has its own ways to express feelings. In many cultures, certain topics should be omitted and direct questions avoided. Some types of questions and topics are considered rude to ask. Pre-knowledge of the culture along with awareness and humility in conversation can give the interviewer insight into such communication practices.

3.8.4 Language

Not speaking the native language of the respondents affects the results. How much depends on the level of English skills the informants have. In this project an interpreter was hired but only used in those cases where it was absolutely necessary. This was a security for both the researcher and the informants. In cases where the respondents did not know the English words needed, they could ask the interpreter.

3.9 Chapter summary

In this chapter a presentation of quantitative and qualitative research methodologies has been given. Validity, reliability and generalizing data have been presented and confirmed in both approaches. Based on the research question and the context of the field study the suitable research methodology was found. Qualitative research was carried out through semi-structured interviews where the research question can be answered.

The informants used during fieldwork in the Lao PDR consisted of 25 people. They came from the Lao Government, The National University of Laos, two different high schools and from a non-profit donor organization.

Performing research in a foreign developing country like the Lao PDR adds a number of challenges. One is related to the process of designing the interview guide. Particularly, language and culture were important to consider. Another challenge relates to the interviewers appearance and role in the research.

4 Results

In this chapter the results from the interviews are presented. They are thematically arranged according to the matrix presented in chapter 3, starting with social and economic development. When presenting the findings, the informants' descriptions are made explicit by the researcher's description. The results are presented in this chapter through a rich description including contextualizing and interpretation by the researcher (Gentikow 2002).

The results from the interviews conducted during field study in the Lao PDR should provide answers to the following question:

> *"What are the current issues and challenges associated with implementing ICT based aid to least developed nations?"*

The answer to this will be provided citations from the informants. What they imply as the challenges when working with ICT is of special interest. Throughout the chapter the UN and other organizations and researchers involved, will be referred to. This provides a theoretical framework for the chapter and gives a better understanding of the high level ICT aid goals. Theory, national goals and the UN's approach, provides a basis for understanding the first sub question:

> *"How do high level strategic ICT aid goals get implemented at the field level?"*

Following, is a presentation and discussion of the results from the interviews carried out in the Lao PDR. Throughout the analysis**,** the informants' views will be discussed according to the visions, plans and projects initiated by the international community. The first part will address issues relating to economy and includes income, infrastructure and investments. A section discussing political issues follows, covering the Lao government's IT action plans and policies regarding use and development of software and priorities. Finally, human resources and education is presented.

4.1 Social and economic development

For developing aid projects, the main goal is to arrange sustainable social and economic development. The National Socio-Economic Development Plan (NSEDP) is the Lao government's development 5-year plan for sustainable development. The goal is to improve the living conditions for the multi-ethnic population and to assist in reaching the countries 2020 goal of escaping the "Least Developed County" label (UNDAF 2002).

4.1.1 Social development

Professor in sociology and advisor to the UN, Manuel Castells, sees social development today as:

> "determined by the ability to establish a synergistic interaction between technological innovation and human values, leading to a new set of organizations and institutions that create positive feedback loops between productivity, flexibility, solidarity, safety, participation and accountability, in a new model of development that could be socially and environmentally sustainable"(Castells and UNRISD 1999: 9).

To acknowledge the goals for development is not the main challenge, it is how to reach them. Because of conflicting interests, agreement on values and priorities can be problematic. To understand the processes and transformations necessary to desired goals is vital, and these issues foster disarray in social and economic policies. The information technology revolution and the process of globalization trigger such processes (Castells and UNRISD 1999).

Social development can be fostered through ICT in many ways. In a written interview from Ms. Sisavanh at STEA, she explained how ICT could foster social development in the Lao PDR:

- "Get the useful information for increasing the knowledge to be applied in daily work, research and education
- Change the lifestyle behavior and can be communicated with other countries in terms of data and information
- Increase efficiency of staff through capacity building
- Get access to productive resources" (Ms. Sisavanh at STEA)

The latter issue, "get access to productive resources" is relates to land, market, transports and telecommunications.

4.1.2 Lao culture

Sharing and preserving Lao culture is important for many people in the Lao PDR. The possibility for sharing Lao culture and learning about other cultures is seen as one of the benefits provided by Internet use. At the same time there is also concerns attached to whether the Internet can be destructive on the culture.

> "If we want to develop ourselves in terms of economy and technology I think we have to use this [ICT]. But at the same time, the government and we as NGO in Laos should help with protecting the Lao culture so we don't lose our culture" (Mr. Vorasone, Jhai).

4.2 ICT and Economic development

As presented in chapter 2, economy is the driving force of modern communities. Capital gives freedom of action and lack of it adds restrictions to inhabitants and the government. The Lao PDR is one of the least developed countries in the world and has poor economic and infrastructure development. Economy was an important topic in the interviews embracing issues like income, infrastructure, Internet costs, computer prices, budget and poverty.

The Lao Government acknowledges the importance of using ICT to participate in globalization.

> "ICT is an important factor to knowledge-based economy in the area of globalization" (Ms. Sisavanh, STEA)

> "We have to [use] ICT or else it is very hard for Lao to participate in the process of globalization" (Mr. Keonahkone, STEA).

Discussing ICT for social and economic development, one of the key issues according to Ms. Sisavanh is the selection of appropriate technology.

> "The selection of appropriate technology is undoubtedly one of the key issues to be related to economic capacity, production, market, resource and environmental conditions" (Ms. Sisavanh, STEA)

The Internet generates opportunities for expanding economic activities, income and employment as presented in chapter 2, thus influencing research, healthcare, education, government and business. Not only can ICT create new jobs, it also gives people new means for finding labor. In addition, ICTs arrange for new ways of producing goods as well as opening up for new markets.

4.2.1 Income

One aspect of a country or a person's economy relates to income level. Working at the National University of Laos with a PhD degree pays about 20-30 USD per month. To be employed by the governments pays about the same.

> "I worked for the National University for about ten years and then I resigned. The reason was because of economy. I could not afford to take care of my family. The salary was too low" (Mr. Vorasone, Jhai).

4.2.2 Infrastructure

Infrastructure can be defined as the "basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons" (www.dictionary.com). As illustrated in the matrix, infrastructure was discussed by all groups of informants: STEA, Jhai, NUOL, ILC Vientiane and ILC Phon Mi.

> "Invest in creating material and technical infrastructure in [...] different sectors and local level such as; laboratory, training centre, experimental station to meet the need of research development in the nearest and long term period" (Ms. Sisavanh, STEA)

The rural villages in the Lao PDR are especially exposed to underdevelopment with low infrastructure in the fields listed above. Because of the mountainous terrain it is expensive for the electricity and telecommunication companies to expand their networks. This results in the majority of the population being excluded from the benefits of electricity and telephone lines. The poorest people in the Lao PDR inhabit these parts of the country. Infrastructure was indicated a problem for the informants when introducing information and communication technologies.

> "As you know we have not very good infrastructure. Some times slow speed" (Mr. Keonahkone, STEA)

The informants, all having access to ICTs, were concerned with the instability and weakness of the existing technology. This left them in a situation where the infrastructure could not be trusted to function as planned.

Date:	Wed, 15 Oct 2003 04:54:07 +0000
From:	Chanthamaly Phonekeo <ponponk@hotmail.com>
To:	synneve.monstad@student.uib.no
Subject:	ICT in Laos

”Dear Ms. Synneve Monstad
I got your mail, but it is quite late to reply you, I am sorry about that. But do you know what problem make me late like this, It is the problem of ICT in Laos.”

Figure 16: E-mail from Mr. Phonekeo at the NUOL

4.2.3 Internet providers

As discussed in Chapter 2, there are different Internet providers in the Lao PDR. All of them are located in the capital city, Vientiane. The study showed some dissatisfaction with the Internet providers mainly because of slow and unsteady connection.

4.2.4 Internet/computer prices

Internet connection and computers are expensive and only a small number of the Lao people can afford it. Due to the low income levels throughout the country, the prices for equipment needed to access the Internet is prohibitive. The high prices of technical equipment are stated as one of the main challenges when introducing ICTs.

> “High prices of computers, scanners, printers, […] telecommunications and Internet access fee” (Ms. Sisavanh, STEA).

One solution is to:

> “create tax exemption for computers and equipment aiming to ICT and development” (Ms. Sisavanh, STEA).

For the Internet subscribers that live in rural areas, connecting to the Internet is especially expensive. They first have to dial long distance to the capital Vientiane. Ms. Sisavanh at the STEA implies that one way to include rural villagers in the information society is to:

> “reduce the price of computers and equipment, Internet access fee and telephone communications that will allow the rural people to increase the opportunities to ICT use and development” (Ms. Sisavanh, STEA).

Following this suggestion might provide the opportunity for a larger portion of the Lao population to participate in the information society. A further discussion of how this can be done and the implications of it is not included in this project.

4.2.5 Investments

The Jhai Foundation is concerned with doing investments in various fields to arrange for the Lao people to be self-sufficient and escape poverty. One of the areas they are involved in is promoting Lao products to the rest of the world. This is done in coffee production, weaving and handicrafts. They provide training to ensure high quality products that meet international criteria. Other fields they operate in are health care and development efforts such as building wells. Finally, they invest in education with focus on training students in using ICT.

The Jhai Foundation arranges for teachers in local areas to receive computer training at the Internet Learning Centers.

> "They [the schools] don't have to invest more money to send their staff to learn how to use computers. And also the kids. They have a place to train" (Mr. Vorasone, Jhai).

4.3 Government and administration

Good governance is part of the fourth goal for development defined by the UN country team in the Lao PDR. When executing the goals, they wish to apply a human rights-based approach to development (UNDAF 2002).

The Science, Technology and Environment Agency (STEA) is appointed by the Lao Government as responsible for the national plans for e-policy and e-strategy. Such plans stake out the country's development plans for ICT. They hope that the prime ministers office will approve a drafted five-year plan during the first part of 2004.

During 2003, the agency has focused on defining important areas for planning and drafting the e-strategy proposal. This work includes workshops with people from the private sector, the government and the NGOs. Eventually the proposal will be agreed upon by the government and defined as a national policy.

4.3.1 E-strategy policy

The e-strategy project focuses on five areas of planning. The first area concerns infrastructure, telecommunications and promoting industry. The second is within ICT application. Another area is standardization and localization, followed by planning a legal framework in ICT. This includes cyber law, cyber crime and Internet regulation. The final area is within human resources development. The immediate problem the country is facing is the lack of IT professionals; therefore this area is of high priority (Mr. Keonahkone, STEA).

4.3.2 Lao language set and content

Language is one of the main challenges the country is dealing with when introducing new computer based technology. Because of the lack of English skills, using computers with English language set and Internet with an English Internet browser is problematic. The Lao Government is working on defining a Lao standard language set and Lao web browser. Hopefully, this will result in increasing use and skill development of computer technology. In the future this might increase the amount of Lao content on the Web.

Mr. Keonahkone implies that one of their main areas of forecasting is within standardization and localization:

> "In Lao we have an official language and we need to use the content to learn about this. We face problems because different agencies and the private sector use different standards. Then there are problems with exchange" (Mr. Keonahkone, STEA).

Further he states that:

> "If you go to the public sector you see that they do not use computers. We have not been able to use computers in Lao" (Mr. Keonahkone, STEA)

The STEA is working on developing Lao software:

> " Now we have developed some proposals for example for Lao content to be developed for, develop a package that is able to use the Internet so people can send e-mail in Lao and view the Lao content in the browser" (Mr. Keonahkone, STEA).

> "What we are facing now is that the Internet can not compile with the Lao language" (Mr. Keonahkone, STEA).

4.3.3 Compatible software and standards

In 1996 a commission was appointed at the STEA. Its area of work was to define software standards to be approved by the Department of National Standards. Software standards are regarded important to ensure compatibility, convertibility and interaction between current and future information systems within the government (Chansavat and Sayo 2000).

The interviews carried out at STEA, along with the results from the E-Readiness project carried out by UN Volunteers, showed that software standards are not in use. Today there is no governmental intranet system, and software solutions are done within different departments, and agencies are chosen with little thought of future needs. Lack of system coordination will be a major obstacle when the government fully implements an intranet system (Chansavat and Sayo 2000).

Computers have to use identical character set to be able to exchange textual data. There exists no standard for Lao software. Different institutions and organizations, both in private and public sector, use several different conventions for integrating ICT in their organizational structure. This makes electronic communication among these groups troublesome. They are not able to take full advantage of the possibilities computer based technology provides. The UN Volunteer team has identified two major areas that require immediate attention from the various users:

> "Standardization of the Lao Character Set, this includes standardizations for input specifications and methods, and output specifications; Software and hardware standardization for government ministries and agencies, in participation of an open and integrated governmental Internet/Intranet system" (Chansavat and Sayo 2000: 2).

At Vientiane High School there is different donor organizations involved in providing computers. In addition to the Jhai Foundation, the Friends Donation is active. Some of the computers donated by them are installed with Thai language.

> "Most of [the software] is in English, some in Lao. First we have the net from the Lao people at Friends Donation. They give the program in Lao. But it's faced some problems because it's new. For computers there is no Lao exactly, we have to share with Thai" (Mr. Saming, Vientiane High School).

4.4 Foreign aid, poverty and ICT for development

4.4.1 Least Developed Country

As discussed previously in Chapter 2, reducing poverty is the strategic development goal to the Lao PDR. By 2015, they wish to escape the group of least developed countries. Some of the informants were asked whether or not they thought this was a realistic goal.

The interview with Ms. Sisavanh showed that she finds the goal realistic if the government's eight priority programs are followed:

- "Food self-sufficiency
- Stop the "slash and burn" cultivation
- Market productions
- Basic Infrastructure Development
- Improve economic cooperation with other countries
- Rural development
- Human Resource Development
- Development of the service sector " (Written interview with Ms. Sisavanh)

Within each of these programs there is series of projects and action plans carried out.

As suggested by Mr. Vorasone, providing means for communication is one way to reduce poverty by using ICT.

> "In one way within communication, telephone call, Internet call. In this way they can communicate with their cousins or distant family and connect with them and they can provide some help, communication, training or whatever that could bring us a lot of things" (Mr. Vorasone, Jhai).

Mr. Phonekeo at the NUOL stated that because of the development levels in the Lao PDR they should be particularly interested in introducing ICTs.

> "Laos has been a very weak country, and we become weaker. That's why we have to…we should have a good reason to see the world, and see how other countries are doing with ICT"
> (Mr. Phonekeo, NUOL).

4.4.2 Land Locked Country (LLC)

The one thing LLCs have in common is that they do not have coast line(s). This is an important aspect in development and land locked and least developed countries tend to have the lowest level of development.

> "Laos is a land locked country…it is very hard to connect with outside, for example culture or outside economy, environment" (Mr. Phonekeo, NUOL).

Another aspects of this is provided by Mr. Phonekeo when comparing the neighboring countries, the Lao PDR and Thailand, which used to be quite similar.

> "…In poverty Laos and Thai is on the same level, but because Thai is south they have sea to connect [with] western countries. Shipping. Then Thai will develop faster that Laos" (Mr. Phonekeo, NUOL).

Further Mr. Phonekeo advocates that ICTs can connect the Lao PDR to the rest of the world. Because the Lao PDR is a land locked country, they do not have the sea for travel and communication. This makes digital contact even more important.

4.4.3 Foreign aid

To understand the different elements in foreign aid, an interview was carried out in a donor country to supplement the Lao interviews. Like presented in Chapter 3, Norway was chosen to represent the donor countries and an an ICT Government worker in Norway was interviewed. This was done to see what contrasting approaches and dilemmas exist when comparing the two countries. In the following section a short introduction to Norwegian foreign aid will be given. The role as receiver versus donor will be discussed in section 4.4.4.

The JICA (official donor organization in Japan) was discussed as the main donor to the Lao PDR. This is confirmed through the presentation given in the United Nations Assistant Framework to the Lao PDR (UNDAF) (Table 7). Other donor countries discussed were SIDA (Sweden) and KOICA (Korea). China was not mentioned in discussions about foreign aid. One possible reason for this might be that they support projects unknown to the university. Table 7 illustrates who the donor countries are in Lao development aid. The main donor, Japan (JICA), gives almost half of the entire foreign aid to the Lao PDR, followed by China.

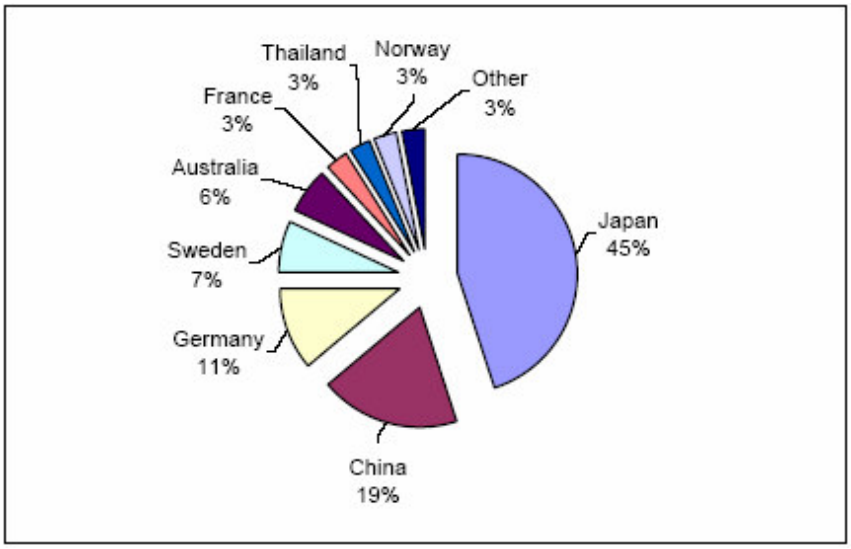


Table 7: Donor aid to the Lao PDR by country (UNDAF 2002)

Norway and foreign aid

Norway is one of the richest countries in the world and contributes considerably with foreign aid. In 2003 they provided 14.4 billion NOK in developing aid, which accounts for 0.93 % of the Gross National Income, GNI. This share places Norway within the 5 countries in the world that give more than 0.7% of their GNI to developing aid. Even though they are one of the leading countries, the goal is to increase this share to 1 percent within 2005 (NORAD 2004).

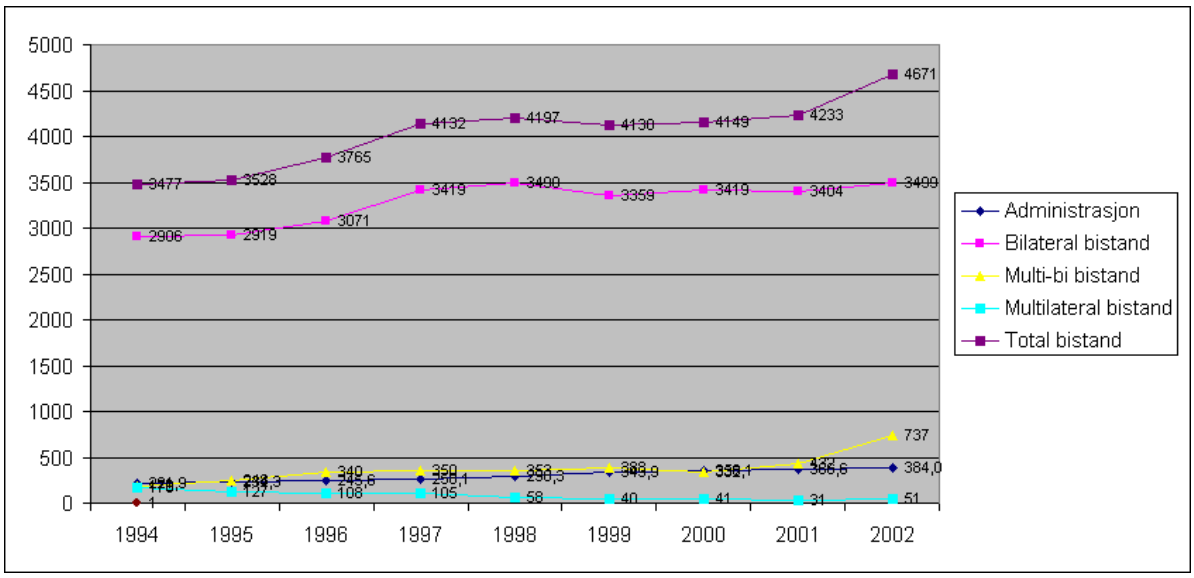


Table 8: Gross numbers of Norwegian aid, NOK in mil (NORAD 2004)

Norway's financial situation and involvement places them in the role as donor country. Because of this position the following issues could only be answered hypothetically.

4.4.4 Comparing a donor and a receiver country

One of the interesting issues to discuss when looking at these two countries is their approach, hypothetical and factual, to receiving aid. Financial independency allows a country to define policies of acceptable behavior. Policies followed by sanctions places restrictions on donors in terms of advertising and other benefits. An illustrating example is a computer company willing to provide schools with computers. Can they be denied benefits such as free advertising for the products? This example was presented to the government employees in Norway and in the Lao PDR.

From a hypothetical point of view, Mr. Tuftedal stated that such initiatives would not be acceptable in Norway. When giving aid, the donor would have to act in accordance with the policies defined. For a developing country this freedom of choice is not a matter of course. Being dependent on donor funds does not provide them such freedom. According to Mr. Phonekeo at the NUOL, they have no exact policies relating to these issues. Being a national university they are dependent on the government to decide which donors will provide help. To assist the government in this work, the general framework, The National Science and Technology Policy, was adopted in September 2003 (Ms. Sisavanh, STEA, Mr. Phonekeo, NUOL and Mr. Tuftedal, Bergen Kommune).

In some cases, receivers of donor aid do not feel included in the decision making process.

> "…we can not join, because every project is on the faith of the donor. And we are acceptor country, we just accept" (Mr. Phonekeo, NUOL)

Not having a say when projects are decided on can result in a lack of ownership of the projects. This is negative for parties involved and an insufficient way of managing foreign aid.

> "For example, if we want JICA to support this one, and they say, "no, I don't want to support this, but want to do this", we accept. It's better than we don't have anything" (Mr. Phonekeo, NUOL)

4.4.5 Local ownership

Local ownership is a critical factor for successful and sustainable developing projects. The Internet Learning Center project gives the high schools ownership of the centers. After a period of two years they take over the centers and are made responsible for running it with an economic profit.

> "When we hand over the ILCs to the school it belongs to them 100%" (Mr. Vorasone, Jhai)

Local ownership does not only include projects being handed over to the receivers. More important is that the receivers are involved from the initiating phase. This idea is practiced by the Jhai Foundation.

> "Before we started our project we asked them what they wanted. And they said electricity, and they wanted water, roads and they wanted telecommunications" (Mr. Vorasone, Jhai)

To listen to the receivers' wishes and needs, as well as including them in the decision making process, is vital for sustainable projects. Then the locals might have the information and motivation needed to continue the project after it is handed over to the community.

4.4.6 The role of ICT in development

According to the Human Development Report, "technology can be a tool for – not only a reward of –development" (UNDP/HDR 2001). How technology is used depends on the users' situation and the context. This view is also enforced in Norwegian developing aid where they state that:

> "ICT will […] not be a goal in itself, but function as a tool to accomplish development goals" (www.norad.no, writer's translation)

Within the UN there was support of ICT for development when they, together with the G8 (group of industrialized) countries, flagged ICT as a global development priority (EO and UNDP 2001). This cooperation is referred to as the Okinawa Charter on Global Information Society and the outcome was captured in the statement:

> "Everyone everywhere should be enabled to participate in…the benefits of the global information society" (EO and UNDP 2001).

Some people are skeptical to the role ICT can play in fighting poverty. They argue that investments would be more effective in the fields of health and education. These fields will benefit the people more than the Internet. Others say that too much focus is placed on ICTs, and that the results of ICT projects for development are yet to be proved. Even though disagreement exists, the UNDP expresses that a consensus appears to be emerging (EO and UNDP 2001).

If ICTs are properly used they can be important development-enablers, especially in the work of fighting poverty. This can be done through introducing aid management systems and "facilitate social inclusion, information access and knowledge-sharing in remote areas and

with/among disadvantaged groups" (EO and UNDP 2001). This again will affect the health sector, education and social and economic empowerment. See Chapter 2 for further reading about the influence ICT can have within education, health, farming and government.

The United Nations Development Program (UNDP) outlines six issues as the main challenges for affecting the outcome, implementation and design of ICT projects for development; politics, awareness access, sustainability, coordination and effective use (EO and UNDP 2001).

4.4.7 ICT to rural areas

The Lao PDR consists of 80% forest and mountains, and 2/3 of the population live in rural areas. These groups of people are mostly farmers, and dealing with poverty is part of everyday life. The majority of poor people live in rural areas and the benefits, challenges and impacts of ICT are closely related to the ones for poverty and ICT. This will be discussed in depth in the forthcoming section, Poverty and ICT.

Because of the country's terrain and economy, there is a major lack of infrastructure outside the largest cities, leaving many people without electricity and telecommunication. Taking advantage of today's modern technology might give them new ways of access to ICTs. For small businesses and farmers ICT can be a vital tool for keeping up to date on methods and prices.

> "I think that if we have good infrastructure like telecom it would help people in the rural areas to catch up with new information and new technology and use long line learning" (Mr. Keonahkone, STEA)

Building out the communication infrastructure sufficiently will give rural villagers new technological knowledge as well as means for communication and information. One of the benefits lies in the possibility to attend long line education. Including villages in rural areas can have major effects. Some effects are that a larger portion of Lao people are included in technological development, which can provide new job opportunities, means for communication, increased human resources and higher educated people.

4.4.8 ICT for poverty alleviation

In the interviews, it has been discussed whether ICT is applicable to reduce poverty in developing countries. For the students the question has been; "how do you think that using computers can give people better lives?" and for the other group, "how do you think ICT can help to reduce poverty?"

Again, there is a positive attitude to what problems ICT can solve and the impact it will have for the poor people to be included in the information society. Some of the informants were not able to give an example of how ICT can benefit poor people. Still, they all implied that it would be positive.

Lao people have a strong tradition for holding together within families. They help each other out of crises such as death in the family, building new houses or unplanned economic expenses. It is also very common to receive financial help from family abroad. To have access to ICTs will give them the possibility to maintain contact with their kin living other places (Mr. Vorasone, Jhai). The economic possibilities introduced by ICT can be great

giving people a tool in finding work or directly by making a living of it; for example, by running Internet cafes or giving training courses.

4.4.9 Leapfrogging

Leapfrogging is a term presented in chapter 2 of the thesis. It is widely used when discussing ICT and development. An example of leapfrogging is developing countries that take advantage of modern technologies such as wireless communications, instead of starting at the beginning of the technological development.

Wireless communication has been helpful in the Lao PDR, especially in those areas where there is lack of other infrastructure providing telecommunication. Villages that used to be isolated can leapfrog development stages and communicate through wireless connection to the Internet.

> "We should know what and where we are now, and what we are doing now. And then we can compare to other countries, other international associations. So, ICT, technology, we should know how we are, if we need to run or walk slowly" (Mr. Phonekeo, NUOL).

4.4.10 Negative effects of the Internet

The government is concerned about the wide variety of information on the Web. During 2003, they are drafting plans and regulations for desirable use of the Internet, including plans for a one-gateway system. The Lao PDR has experienced "information-related" problems, which has made them aware about the use of information-channels. The study showed that topics considered negative on the Internet include "nudity, pornography and things like that. These are the bad parts" (Mr. Phonekeo, NUOL)

The Internet is illustrated as having two faces, one dark and one bright:

> "Everything has two faces, one dark and one bright […] If ICT has some problems or something bad in ICT, but we use only the best" (Mr. Phonekeo, NUOL)

There are dark sides to the Internet, however Mr. Phonekeo strongly advocates for the need to still use it. Trust must be given to the users that they are able to see the good uses of Internet. This should be done together with informing the new and/or young users of the positive and negative sides of Internet. Further he says that they don't want to be afraid of new things and only seeing the dark.

> "We have many challenges to learn from Internet, to learn from ICT. We don't want to be afraid to only see the dark […] I think we don't need to be afraid. We have to extract and to spread our culture, outside together, to exchange. Not only accept" (Mr. Phonekeo, NUOL)

Mr. Vorasone also discussed the negative effects of the Internet. He suggests dealing with the negative effects from the Internet by encouraging proper use.

> "We mean that all agencies that allow to use Internet for the local users should help in advertising […] Not only teaching about the good things with the Internet but we also have to point out the bad things. We the users should learn how to use it. Everyone should be involved in doing this. It is public education" (Mr. Vorasone, Jhai).

4.5 Training and education

4.5.1 Human capital/resources

Human resources development is given high priority by the United Nations as well as the Lao government. To improve the human resources throughout the country, ICT is considered an important tool. Lack of human resources poses a serious constraint on development for the country. According to the UNDAF, "the Lao PDR is critical short of the "social capital" required for development" (UNDAF 2002: 68). This comes from a general lack of experienced and well-educated personnel at all levels of society, and in all sectors. To deal with these issues, projects to develop a sustainable human resource base are initiated in the public sector and in education.

The UN stresses that there is an urgent need to deal with the lack of human resources, both the number of qualified and trained people, as well as the quality of their training. Human resources should be incorporated in the national development goals. The UN country team will assist the government in adopting:

> "[…] a comprehensive strategic approach to HRD in all sectors and at all levels, and improvement of human resource planning to ensure an optimal utilization of 'social capital'. In addition to adapting training curriculum involving the private sector the UN will focus on skills development, quality assurance and staff motivating projects" (UNDAF 2002).

At the STEA it is stated that human capital or human resources are the main challenges the Lao PDR is facing when introducing ICT. According to Ms. Sisavanh:

> "Human capital development is considered as one of the most critical factors of economic growth and poverty alleviation" (Ms. Sisavanh, STEA)

Mr. Keonahkone indicated that one of the five areas they work in is human resource development. This is specifically related to human IT resources to deal with the lack of IT professionals. At STEA, they develop action plans to extend trainings for the vocational training center. Another goal is to forecast ICT development and come up with proposals on IT education to the Ministry of Education.

Mr. Bounthong says that human resources are one of the three main challenges he faces when operating the IT center at the NUOL.

> "We have very few qualified staff. Just now we have problems with the Internet, but no one to fix it" (Mr. Bounthong, NUOL).

Human resources and education is also stressed by the United Nations through the role it is given in the Millennium Development Goals. Several of the targets defined address the importance of education and training to improve human capital or resources.

The national development goals define human resource development as one of the main priorities. Within this, capacity building for community development and public management is given top priority. Human resource development is one of the eight national priority programs to escape poverty and the category "Least Developed Country" (Ms. Sisavanh, STEA).

4.5.2 Brain drain

Brain drain occurs when "a country becomes short of skills when people with such expertise emigrate" (Mutume 2003). The result is that the country, agency or organization looses valuable human expertise. For developing countries this is a major problem with fatal results. The Lao PDR has had a strong tradition of educating people abroad, especially in former communist countries, and count on the students returning to work for the government after completing their education. However, attaining an international degree gives the students possibilities to work elsewhere.

For the Lao PDR, brain drain is not only related to people leaving the country, but also people taking work for foreign and private companies in the Lao PDR. Private companies offer about ten times the salary the public sector can offer.

> "Here at the IT center we have 11 staff members, but it is a big challenge for me as the boss to meet the goals because of the economy and lack of human resources. Because of the low budget we can not recruit new staff and the staff we want. We can not pay the same as they do in the private sector" (Mr. Bounthong, NUOL).

> "They train people but they don't have the economy to keep people working for them" (Mr. Phonekeo, NUOL).

Developing countries face a dilemma when dealing with brain drain. When educating professionals, the educational initiator can set specific conditions. Commonly, students agree to work for the initiator after completing their education. This practice is widely used in industrialized countries in cases where the government pays for students' education. For developing countries, they could define similar criteria for financed education. The dilemma lies in the power of executing the agreement and carrying out sanctions when there is a breach of contract.

4.5.3 ICT education and training

ICT and education is very important for the National University of Laos, both as a study field such as computer science and also as a tool in all education and research. It is closely related to human resources or capital described in section 4.5.1. Providing training to young people is important because they are the ones who will take over the jobs and be the driving forces for changes. Being young, they also tend to have a higher interest in the Internet and computers both for academic work and for entertainment.

Training gives the users first hand experience:

> "This allows anyone that is an Internet user to touch by themselves not by second hand or third hand connection. They can explore themselves" (Mr. Vorasone, Jhai)

To train students in information technology does not only provide them with a tool for doing their work, it also provides them with expertise within computers and technology. This might provide the students with more job opportunities.

The educational sector is a high priority field for the government. Ms. Sisavanh discusses the need to:

> "Invest in ICT human resources by integrating ICT in the curriculum of secondary school and university as well as professional courses" (Ms. Sisavanh, STEA)

The government acknowledges the importance of using computer technology in the administration of the country and also cooperating with other countries. A training center is opened to give employees computer training.

4.5.4 Computer skills

Computer skills or lack of computer skills is a problem for the ones who work on introducing information and communication technologies to the Lao PDR. This issue is closely related to technical problems and maintenance.

Lack of computer skills makes development within ICT challenging, since they lack people with over-average computer knowledge to impel development within the public sector and the education. To solve these problems, the government acknowledges the importance of introducing computer classes in school as early as possible.

4.5.5 Technical problems

This issue was brought up at different levels, from the government to the rural high school. It includes the technical problems that the government sees when forecasting and drafting plans for development through ICT, along with their every day practical problems when using computer-based technology. It also covers the practical problems teachers and IT workers face at the high schools and at the University. Examples of this might be network, hard disk, virus, wiring and mouse problems. The teachers at the two high schools identified that they lack technical skills to repair the computers. When problems occur they do not know how to fix them and hiring professional help from other sources is very expensive.

> "Problems they have when working with computers are hanging computers; difficult to control the mouse and Internet connection is not good" (Mr. Keochay with interpreter, Phon Mi High School).

> "Problems with wireless connection because the computers are too old and some programs disappear when they are used" (Mr. Bounnong with interpreter, Phon Mi High School).

4.5.6 Maintenance

The three issues; maintenance, technical problems and computer skills, are closely interrelated. Technical problems can be a result of poor maintenance and both the problems and the lack of maintenance are results of inadequate computer skills. Maintenance is an important part of working with computers. The government stresses the lack of skills in this field. Also teachers at the high schools worry about this for the future and they are aware of their lack of skills within maintenance.

Maintenance is a concern to several of the informants. The focus placed on it implies the level of importance it has for them. This might be because that they are all users of computers and realize the consequences of computer shutdowns.

4.5.7 Lack of English skills

English is taught in school from the 4th grade. Yet there are very many teenagers that do not speak English. It is a concern for the government that the level of English skills is so low and they are reviewing the curriculum to improve the content. From the interviews it was obvious that students in the capital were better English speakers than students in a rural village.

Mr. Keonahkone at the Science, Technology and Environment Agency is looking into the possibility to start a computer course in the English language at the National University of Laos. The study showed that lack of English skills is a problem for teachers at the NUOL and a concern for governmental employees at the STEA.

Mr. Bounthong, the Director of IT center at NUOL stated that a need for trainers with adequate English skills is one of the three main challenges he faces when working with IT. According to Ms. Sisavanh at the STEA:

> "[…] foreign language especially English and French are the main obstacles for rural people to get access to technology information" (Ms. Sisavanh, STEA).

Further she states that one of the solutions is to:

> "Develop Lao software to support the ease use of ICT for Lao people",

and emphasizes that:

> "Software should be compatible with Lao language" (Ms. Sisavanh, STEA).

Programmers from the Jhai Foundation have developed a version of the free Linux-based KDE graphical desktop in Lao language. This provides different office tools for Lao-speaking users at the Internet Learning Centers.

The problem of lack of English skills the country is facing is a two-sided problem. If the users have an adequate level of English skills, learning about computers and the Internet will be an easier and more realistic task. On the other hand, if the software programs were in the Lao language, the barrier to understand the functioning would be smaller and would make them more independent of help from elsewhere. Improving English language training as well as developing Lao software will help the country, also when taking a long-term perspective.

4.5.8 Research

One of the informants is a research advisor involved in Meta research at the National University of Laos. Through his work he promotes high-level research in the different study fields at the university. Mr. Phonekeo stresses the importance and need for using computer-based technology as the driving force of all research. In 2003, there were only plans for offering Master degrees or Doctor Programs within computer science at the NUOL.

4.6 Awareness of ICT

4.6.1 Public awareness of ICT

Public awareness of ICT is one of the challenges the government faces in their work. Most Lao people are not aware of what ICT is and therefore do not see any reason for learning about it. At STEA one of the solutions is to "raise the public awareness and knowledge on ICT application regularly" (Ms. Sisavanh, STEA).

Another issue related to awareness is that most people think only of computer as ICTs. They do not include communication and the Internet.

4.6.2 ICT awareness for high ranking decision makers

When introducing ICT to the country, it is vital that the high-ranking officers are well informed of the use and benefits it provides. Realizing the advantages might result in the field becoming a national priority area. Also, it would be easier for private organizations like the Jhai Foundation and NGO's to carry out ICT projects in the country.

> "I don't think that we have much in the high ranking of awareness. For high ranking people to understand how ICTs can benefit the country. But we think that we should have some sort of improvement for the ICT policy for the high ranking officer […] because they are the ones who make decisions…for the government…but I think that Laos is starting to be aware of how important ICT is to the country" (Mr. Keonahkone, STEA)

By others it is stated that decision makers are not aware of the possibilities ICTs give. They have the power to shut down projects and prevent organizations to work within this field. It is also implied that awareness of ICT is based on localization.

> "For example in the locale, in the Vientiane capital city it's easy, not very easy but quite easy. But if you want to introduce ICT to other provinces it's something else because the high ranking officer maybe doesn't have enough knowledge about IT and doesn't understand what IT means and the benefits and the positive and negative of IT or ICT" (Mr. Vorasone, Jhai Foundation)

The solution outlined by Jhai Foundation to this lack of knowledge about new technology is to deal with information at the highest level. To gain their support, they need to be informed and trained in ICT and get hands-on experience. This could be done through seminars and courses initiated by international organizations like the United Nations.

From a western perspective, there seemed to be an unnaturally high respect for the high-ranking officers in the country. Because the decision makers do not understand the importance of the Remote IT Village project, the Jhai Foundation is experiencing conflicting interest with the government.

4.6.3 The authorities

Conflicts with authorities can arise because of misunderstandings or different perceptions and priorities. The Jhai Foundation talked openly about their experiences and disagreement with the Lao military. At the moment their project is blocked for any further work. The Jhai Foundation is heavily dependent on the government's goodwill to be able to carry out their projects.

> "I have very little hope to get this project continuing on the same place, same location because the army does not want us to be involved and work in their military camp" (Mr. Vorasone, Jhai).

At the NUOL, it was briefly hinted about the government's desire to control the Internet.

> "[…] because of some in government, maybe some people are…they don't believe in the power. But for me, because I am an academic staff, I believe in myself to do best, to do it together, to exchange together" (Mr. Phonekeo).

4.7 Use of ICT

In the research project it was important to investigate how the end users in the Lao PDR understand computer-based technology. Through their perceptions of the benefits, challenges and problems attached to using ICT, their understanding can be revealed. The students were asked questions about what computers are good for. Also, they were asked about how much, where, and for what they use computers and Internet. The other informants were given more general questions concerning challenges and benefits of ICT.

4.7.1 Communication

Eight of the nine students at Vientiane High School say that they use computers for communicating. Seven of them imply that they use the Internet for chatting with friends and kin living elsewhere.

At the rural school of Phon Mi three of the six students say that they have e-mail and that this is what they use the Internet for. Within the students at Phon Mi High School, "chatting" was not mentioned when discussing use of the Internet. One likely reason for this might be that none of the students had computer at home. The majority of computer use was done during training classes at the Internet Learning Center. Here they do not have the possibility to sit down and use the Internet for a longer period to chat. In the village and surrounding area there is a scarce offer of Internet cafés.

One of the benefits of the Internet is that it links countries together. By using the Internet, the world is brought closer to the Lao PDR. While getting first hand experiences, they have the possibilities to share their experiences, knowledge and culture with others.

All the informants indicated that the Internet is a useful technology that is used for:

- Communication,
- Pleasure,
- Play games,
- Search for information, old and new,
- Share culture, and
- Link countries

4.7.2 The high school students

The results show that the students at Vientiane High School are more frequent users of computers and Internet compared to the students at Phon Mi High School. In Vientiane four out of nine students have Internet at home. Also, four of the nine, go to Internet cafés. Some of the students who have Internet/computer at home still go to Internet cafés. At Phon Mi High School the students' use of the Internet differs compared to Vientiane High School. None of the six students have computers at home and only one student uses Internet café/computer store.

One likely reason for these differences is that the students in the capital city (Vientiane) come from wealthier families. Like discussed earlier, the majority of poor people are concentrated in the rural area of the country. The students may not be able to afford a computer. Also, they might not have extra money to spend at Internet cafés. This indicates a limited clientele for

the Internet providers and the market for computers. Mr. Vorasone at the Jhai Foundation provided an explanation of the user frequency and the way of thinking:

> "In the country side before you spend 10 000 kip (= 1 USD) you think 10 times. But here in Vientiane you maybe think one time before you spend 10 000 kip. The cost of the Internet is much the same. The expenses are about the same but the incomes differ from the area. The price for using the Internet might seem reasonably in Vientiane but expensive other places"(Mr. Vorasone).

Another reason for the differences based on location can be that only a small percentage of the Lao people have telephone lines. In 2000, 8 people per 1000 have telephone. This number has doubled since 1995 and is rapidly growing. But still, the waiting time for lines was, in 2000, 1.1 years. The majority of people with telephone lines live in larger cities.

The students used in the interviews receive computer training from their high schools in computer rooms provided by the Jhai Foundation. During the training classes, they are introduced to Microsoft programs, mainly Word and Excel. Common for the students, independent of their location, is their positive attitude towards computers and the Internet. One of the students commented:

> "Computers can help people to do anything, make people to know other people from all around the world through Internet" (Mr. Sitthicleth, Phon Mi High School)

4.8 The UNDP in the Lao PDR

When studying the results from the fieldwork in the Lao PDR, the researcher felt that the information received about the UN's role in the country was insufficient. The obtained information was collected through their formal plans and visions for the country. For a better presentation of the field research, it was regarded valuable to include an UN worker's view of the country's conditions. Therefore new attempts were made to get in touch with UN workers. Once more the UN office in the Lao PDR was contacted by e-mail with the questions attached. On second attempt the response was positive and the answers to the questions were given.

The new informant was Mr. Tran Minh, representing the United Nations Development Program. His responsibilities lie in supporting, monitoring and evaluating development projects using ICT. Also, he coordinates regional initiatives from donors and other actors regarding ICT for development.

The questions given him were the same as the ones asked in the interviews in group 1. Because the interview was done in writing through e-mail, follow up questions could not be asked at once.

The main benefits of ICT are data management and communication. In the Lao PDR this is concentrated to "e-Government and SME development". Within the government the goal is to make the institution more efficient and transparent. ICTs are seen as applicable in this process.

> "There is still no doubt that Laos needs the benefit of ICT to become a developed nation and that ICT can benefit even in the current situation if applied correctly and in correct places" (Mr. Tran Minh, UNDP)

The stated challenges when applying ICT are low capacity and lack of human resources. In addition, Mr. Tran Minh states that the small market for making investments in the Lao PDR affects the technological development. In fighting poverty, it is suggested to use ICT to "improve economy by providing more livelihoods options, especially for handicapped people" (Mr. Tran Minh, UNDP).

The information provided in this interview is a valuable addition to the data collection. Mr. Tran Minh's view resembles the information given by the other informants, and also enlightens new areas. An example is the emphasis on actions to improve living conditions for handicapped people. For a complete version of the interview, please see Appendix A.

4.9 Chapter summary

Throughout this chapter a presentation of the results from the field study in the Lao PDR is given. The informants were employees at the university, high schools, the government, and a donor organization. In addition, a selection of 15 students from two high schools were interviewed.

The main questions given to the informants were related to their perception of the benefits and challenges connected to using ICT.

Informants in group 1, consisting of people employed in one of the listed areas presented above, stated the main benefits of ICT as;

- communication (e-mail and Internet calling),
- link the country to the world,
- information ,
- exchange of culture,
- assist research,
- reduce to gap between rural and urban areas,
- increase human capital, and
- increase efficiency of staff.

The main challenges when using ICT were:

- awareness,
- human resources ,
- lack of foreign language ,
- technical skills,
- infrastructure,
- economy, and
- ICT laws, regulations and policies.

The interviews with the students at the two different high schools were structured differently. Because of this, the results were analyzed and presented differently. When analyzing the results, it was interesting to compare the students at the high schools. Based on their location, rural or urban, their use of computers and Internet was discussed. The results showed that the students at Vientiane High School located in the capitol were more active users of computers and Internet. The likely reasons are that the students are better off financially, possess computers at home with access to the Internet, and have a better access to Internet cafés.

5 Discussion

In this chapter, the informants and their statements given in the interviews will be discussed in light of their organizational affiliation. In addition to this, the information given will be compared to the visions, targets and goals of the UN with emphasize on the Millennium Development Goals. As part of the discussion, the specific country factors that influence the use of ICTs will be included.

5.1 STEA

The meetings at STEA gave the researcher valuable insight into the countries' action plans and policies for using ICT for development. The plans and statements provided, demonstrate that the process of introducing new technologies to the Lao PDR is of high concern to the agency.

Picture 12: The Science, Technology and Environment Agency (STEA)

The Lao PDR has gone through major changes from being a French colony and Kingdom of Laos to the regime that rules today. The Lao People's Democratic Republic was established as a one-party regime in 1975 followed by the communist takeover. Today the Lao People's Revolutionary Party is the only political party allowed by law (www.laosdemocracy.com).

Because of this, there might be special concerns and challenges when introducing information and communication technologies to the country. Issues concerning information can be problematic in such nations. This was experienced in different ways during the field study in the Lao PDR.

During one of the interviews the informant was reluctant of giving out information. The interview was agreed on in advance and at the beginning of the interview a tape recorder was started. The informant hesitated over allowing the tape recorder. The reason stated was the need for permission from the supervisor. It was made clear that the interview could be carried out without the tape recorder. Talking it over, it was agreed that the tape recorder could be used. Decisive for the decision was that a transcript of the interview was going to be provided. In another instance of a reluctant share of information, there was a request that the information provided was only to be used in this thesis. These two examples illustrate the problems people may have when giving out information. One of the informants implied, "the country has had bad experiences where information has been misused".

The researcher felt that there was discrimination that resulted in unequal access to information. At the first meeting with Ms. Sisavanh, it was suggested that the researcher should contact the UN in the Lao PDR to obtain written documentation in English. At the STEA, they could only provide formal written information in Lao Language. The UN librarian was contacted and they provided booklets and reports in the English language. At a later meeting with the STEA, these reports were showed. Surprisingly, Ms. Sisavanh did not know about the reports, even though one of them discussed STEA's role in promoting ICT. Such information could be very helpful for the agency because of its detailed presentation of the ICT situation in the Lao PDR. Ms. Sisavanh's assistant contacted the UN requesting a copy of the same report. The request was rejected because of limited copies.

The discrimination in this case put the researcher in an awkward situation. Since Ms. Sisavanh now knew about the report, the researcher felt that she could not be denied making a copy. On the other hand there might be underlying reasons for why the STEA did not already have a copy. As common practice, the researcher made a point of telling the informants who the other informants were. This was also done at the UN and at STEA. In the described situation it was concluded that since no constraints were given when receiving the UN report, the researcher could not be expected to conceal it.

5.2 Freedom of speech or censorship?

In every society, there are sets of norms and values that are passed down to new generations and groups, and can be viewed as guidelines for the members. An important aspect of this it the collective and personal interpretation of what is approved behavior and what is not. The set of behavioral instructions are culturally determined. They include both oral and often hidden norms in addition to the laws embraced in the legal system. To gain knowledge about the specific norms and values in a society is part of learning the culture and the process of socializing into the society.

Behavior on the Internet is included in the norms. There has been a growing discussion on the needs for rules and laws to regulate behavior and content on the Internet. The very core of ICT is the free flow of information. Through the Internet, information is made available to everyone with access, despite boarders, language and culture.

In this debate there are conflicting views on if, and to what extent, governments should intervene in control of content on the Internet. A study conducted by the Markle Foundation

and Greenberg Quinlan Rosner Research in 2001, showed the American publics' interest. Of the polled, 64% stated that "the government should develop rules to protect people when they are on the Internet, even if it requires some regulation of the Internet" (Markle 2001). The relation between freedom of speech and censorship is an international concern. At the forthcoming WSIS (World Summit on the Information Society, part 2) that is to take place in 2005, the main issue on the agenda will be freedom of press in the information society.

Effective governing of the Internet is especially challenging because of its borderless nature. This calls for increased participation by developing countries and non-profit organizations. Furthermore, the international institutions engaged in Internet governance must ensure democratic accountability. In the work of defining Internet policy, Baird discusses the importance of including three participants: government, business and non-profit organizations from both developed and developing countries (Haqqani 2003).

The demarcation between free speech and legal protection can be difficult to set and the boundaries are often culturally determined. Information related to racism and child pornography is often censored because it is not accepted in most societies.

5.3 Freedom of expression on the Internet

Advocates of Internet without censorship won a major victory in the USA when the Supreme Court struck down the Communications Decency Act. It was ruled that "the interest in encouraging freedom of expression in a democratic society outweighs any theoretical but unproven benefit of censorship" (www.epic.org). Supporters of this view stress the fact that no technology exist that is intelligent enough to block more that 10% of, for example, pornography, without affecting large amounts of other information on the Internet.

5.3.1 Censoring the Internet

Advocators of censorship on the Internet provide different reasons for their views. Some nations have a legal framework strongly influenced by the existing religious beliefs. Their laws often embrace the Internet. For other nations, censoring is politically motivated.

Countries that practice restrictions on use and censorship of the Internet may have different motives. Even though a nation states one specific reason for censorship, there is often a combination of multiple motives. The most common motives are religion, politics and national security. Examples will be given in the following section to better understand the implications, focusing on Saudi Arabia, China and the USA. The first two are active supporters of Internet censorship. Saudi Arabia gives religion as the primary reason for censorship, while in China it is politically motivated. Additionally, the USA is presented is to illustrate the political differences on censorship. They value a person's right to freedom of speech over all other concerns, in this case protection of people when using the Internet.

Saudi Arabia - religious

In Saudi Arabia the public gained access to the Internet in 1999. By 2001, the number of users had reached to an estimated 500 000. The government practices strong censorship on the Internet of what they view as "objectionable websites, ranging from pornography to politics" (HRW 2002). In the Decision Number 163 that was made public in May 1998, it

was required that Internet service providers (ISPs) refrain from "using the network for illegitimate purposes such as, for example, pornography and gambling...carrying out any activities violating the social, cultural, political, media, economic, and religious values of the Kingdom of Saudi Arabia" (HRW 1999). According to the Human Rights Watch Report 2002, the Arabic Internet supervisor, Ibrahim al-Fareeh, is about to launch a new campaign that will block a further 200 000 websites. This will raise the number of off-limit sites for Saudi Arabic users to 400 000 (HRW 2002).

China – political
After the Chinese government opened up for commercial web sites in 1995, they have progressively become more comprehensive in their rules and regulations on the Internet. Attention has been moved from efforts to regulate Internet business, to restrictions on chat rooms and new sites. The statutory regulations give the government authority to arrest and punish any form of undesirable expression on the Internet.

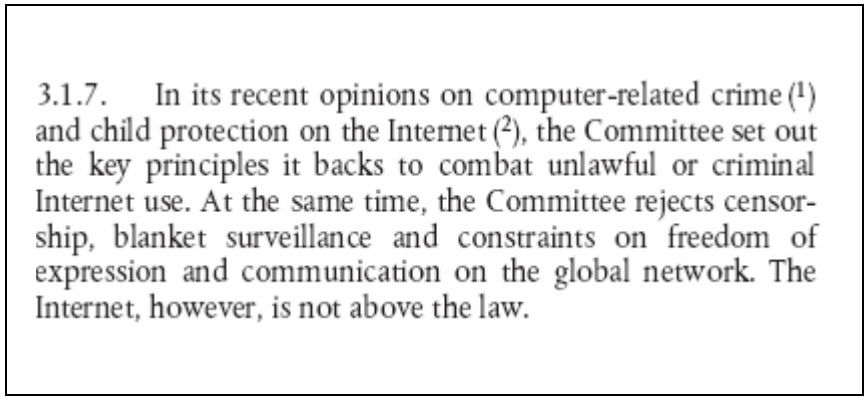
In 2001, government estimated the number of Internet users to be 26 000 000. This growth has been fuelled by improved infrastructure, introduction of mobile phones, and other methods of Internet connection. In addition, increased local language on the Web has contributed to the growth (HRW 2001). The rapidly increasing numbers of Internet users has fostered the government's realization of the need for censorship. To control the content published on the Web, the Chinese government has shifted responsibility from the Ministry of Public Security, to the Internet service providers. The ISPs are obliged to report all use that is incompatible with the regulations. Knowing all of the topics that are considered illegal is difficult for users. Regulations are defined in general terms. An example of this is a regulation implying that "topics that damage the reputation of the State" are banned. In January 2001, sending "reactionary" and "secret" information on the Internet was seen as a capital crime. Persons convicted for misuse of Internet have been sentenced to 2-4 years of prison (HRW 2001).

USA – Protection versus freedom of speech
The USA is roughly estimated to produce 60% of all pornographic material on the Internet. To protect children from harmful content on the Web, the Child Online Protection Act (COPA) was defined in 1998. It authorized fines as high as 50 000 USD for distributing content regarded as harmful to minors on the Internet. Access codes or other personal registration were required for adults who wanted access to this material online. The act never took effect. The Supreme Court in Washington, D.C., USA, voted June 29th, 2004, by 5 to 4 not to carry out the COPA. The court valued freedom of speech as a superior concern. According to Justice Anthony Kennedy, "rapid changes in technology would make filtering software a more effective tool to block access" rather than the suggestions laid out in the COPA (Mears 2004).

5.4 Legitimate boundaries on the Internet

Users of the Internet are personally responsible for how they use it. Governments should continue to ban uses that are statutory illegal. If child pornography is illegal in a country, it should also be regarded illegal on the Web. Censoring the Internet is not a suitable solution to the problem. Like advocated by the European Union actions must be made to enlighten people of the equality of conducting crime in cyberspace versus in reality. Sanctions must

also be made towards Internet crime. Such crime is not an exceptional type of crime and must be treated like any other violation of the law.



3.1.7. In its recent opinions on computer-related crime (1) and child protection on the Internet (2), the Committee set out the key principles it backs to combat unlawful or criminal Internet use. At the same time, the Committee rejects censorship, blanket surveillance and constraints on freedom of expression and communication on the global network. The Internet, however, is not above the law.

Figure 17: Sample from the EU CES 1115/2001 (http://europa.eu.int)

The nature of the Internet provides that international cooperation, including the private- and public sector and non-profit/governmental organizations, must be accomplished in both developed and developing countries. In such a forum, defining the legitimate boundaries on Internet can be done.

5.5 How can ICT influence democracy in the Lao PDR?

The one-party regime in the Lao PDR indicates that there is restricted freedom for the citizens, together with constraint on democracy. Excluding the governments' opponents from elections and political engagement is common practice within the regime. Free elections and educational work might result in the Lao people questioning the current government. To change the ruling of a country is a challenging task. First, changes of this kind are most likely not favored by the high ranking officers because of fear of losing position and power. Second, the Lao people might not have the resources available to force on a change of the regime. Obstacles might be economical, location-based and human resources. As presented in chapter 2, it is reported that e-mails are missing and content changed.

Throughout the interviews the researcher felt that introducing ICTs was valued as important by the policy makers. Still, there might be different sides to this case. The country is placed under pressure from the international community such as the UN to carry out action plans related to the Millennium Development Goals. Another organization that also follows the actions done by the Lao Government in trade, politics and technological development is ASEAN. The union stresses the use of ICT as a tool for communication, and as a tool in projects within the coalition of Asian countries. Mr. Keonahkone at the STEA stated that:

> "I think that ICT definitely can benefit the Lao society. Because Laos has become a part of ASEAN for the Asian countries in the region and we want ICT for the ASEAN to develop in cooperation"
> (Mr. Keonahkone, STEA)

There might be several reasons for why introducing new technology is valued by the policy makers. People in the Lao PDR with higher education have studied abroad. Until recently the

educational system has been poor. When studying abroad, these people have seen different uses and benefits of computer-based technology. Another reason might be that the STEA is concerned with science, technology and the environment and within these fields the potential of using ICT can be great.

Picture 13: Interview with Mr. Keonahkone at STEA

Pictured together with co-worker Teresa (right) and the interviewer (left)

Even though the STEA may be interested in promoting ICT, there may be conflicting opinions within the government and the high-ranking decision makers.

5.5.1 One gateway system

One example that illustrates this view relates to the government's plans to control the use of Internet. According to the "E-readiness Assessment in the Lao PDR," the STEA, together with the LANIC (the Lao National Internet Committee), are working on implementing a "One Gateway" Internet System. The idea is that all access to the Internet should go through the governmental gateway. How this can be enforced is still unknown, but according to the UN report, all organizations will be "encouraged to join the One-Gateway System" (Chansavat and Sayo 2000: 12). Through this gateway access and content on the Web can be monitored.

5.5.2 "Info structure"

Mr. Pissamay, a Lao government worker, provided another example of information control at the "World Summit of Information Systems" in Geneva, December 2003. He agreed on the importance of ensuring adequate infrastructure. In addition, he introduced a new term; "infostructure". He believed that discussing content, regulations and security was vital for the further development of the international information society (www.itu.int/wsis). This concern of content can be related to the government's plan for the One-gateway system presented previously.

5.5.3 Transparent societies

One of the issues on the UN agenda is to make communities transparent. Using ICT, especially for governmental and administrational tasks, is valued as a helpful tool in making societies more transparent and efficient. In the long run this will benefit the entire population

through increased information and access to services. An important effect of this can be reduced corruption since transparent societies make corruption difficult.

During the meetings and interviews at the STEA, the common view was that the possibilities ICT provide are vast. Their positive attitude, together with the detailed plans and visions for developing the Lao PDR into an information society, confirmed that they believed in the importance of ICT. However, reports show that there is not consensus on the degree of intervention for control.

5.6 The Jhai Foundation

The Jhai Foundation is an American non-profit donor organization operating in the Lao PDR. The foundation has put much effort in convincing the government of their friendly motives for helping the Lao people. Recent history has shown that the Lao government tends to distrust foreigners. This relationship and the extent of the problem will only be discussed where related information has been provided by the informants.

5.6.1 The Remote IT Village Project

Although the Remote IT Village Project has used military ground in their communication network, there are indications that there might be other reasons for why this case has been so problematic. One possible explanation is that the Jhai Foundation is an American organization.

5.6.2 Internet Learning Centers

Common for the Internet Learning Centers was that they viewed the researcher as a source that could provide them with computer equipment. Several attempts were made to clarify that the researcher was only a student. This was an issue the researcher was prepared to address. The teachers had nothing to lose by asking. Unfortunately, the researcher could not provide financial support.

Picture 14: Students at Phon Mi High School, Internet Learning Center

The Phon Mi High School is located in a rural village. The population is mostly farmers and the access to electricity is scarce for some of the villagers. The need for an Internet Learning Center is strong since they lack other alternatives. For the computer and Internet users in the capitol, there exists a large number of Internet cafés and the majority of the students interviewed had personal computer at home.

Another reason for introducing rural communities to new technologies is that they often lack other means for communication such as telephone. Giving them access to computer-based information and communication technology can provide the opportunity to leap-frog centuries of technological development.

Tools for communication and information might also provide rural communities multiple business opportunities. This can help fight poverty. Because the majority of extreme poverty is in rural places, introducing ICTs can serve as a tool to improve living conditions. Also, introducing ICTs to rural communities will support the possibilities for long-line and distant education. This provides the villagers the opportunity to attend courses independent of time and space. Including the rural communities in the information society can foster human capital.

To take advantage of the possibilities given by ICTs, action needs to be taken at different levels. First, to make the people aware of the possibilities, they need to be informed. Second, they need access, and third, they need training.

5.7 NUOL

Before visiting the National University of Laos, it was assumed that they would value ICT. This assumption was supported through the interviews. At this learning institution, youth come from the whole country to study. Information and communication technology is a field of studies in itself and it serves as a tool in other subjects.

Picture 15: Computer classes the National University of Laos

Even though the areas of use are intensive, the offers of technology related subjects at the NUOL are limited. Classes within computer science are only offered as part of the Bachelor program in computer science and mathematics. This excludes students who only wish to study computers without attending courses in mathematics.

The research promoter, Mr. Phonekeo, discussed the concerns of computer science education. He had studied in Japan, and aware of the possibilities provided by ICT. But several factors make enhancement of ICT in the educational sector a challenging task. The most evident were the lack of finances, skills, English language skills and awareness of new technologies.

The plans at the NUOL coincide with the plans and visions of the UN and the STEA. They all agree on ICT being important for further economic development. Lack of human resources and skills is one of the main challenges employees at the NUOL and the STEA state when introducing new technology to the country. Because of this, education is specifically addressed in the Millennium Development Goal, both as a goal and within targets.

At the NUOL there are plans to improve class offerings in computer science and to offer a Bachelor program in computer science. Also, they have plans to offer a Masters degree courses in computer science. To realize these plans and visions, major economical contributions need to be made to the educational sector. Where this contribution should come from is unknown, but the public sector needs support from elsewhere. This could be from donor organizations and/or private companies.

There is a great need for updated and comparable software, as well as hardware, both in quality and quantity. In addition to the technical aspects, there is a desperate need for qualified people to train, teach, develop and monitor the implemented technology. Low salaries at the NUOL, and the public sector as whole, they are unable to recruit qualified people. The execution of the plans for technological development must start with training and education. If not, the result might be fatal for ICT development. To have high-tech equipment, but lack of trained personnel to run and monitor the systems, the technology will not be used to its full advantage.

5.8 Researcher's perception of the field work

The researcher's experience from doing fieldwork in the Lao PDR is that the language barrier is the main obstacle. Despite English lessons in school, few speak English well. This was noticeable in terms of scarce vocabulary and misunderstandings. Because of this an interpreter was hired to assist when needed. When using an interpreter, the results are influenced by the interpretation of a third party. In some cases this might misrepresent the information given. The interpreter was used only in cases where absolutely needed. Even though the language difficulty might have influenced the results, the collected information is valued as useful to enlighten the field of research.

Another challenge when working in the Lao PDR was the organization of the government. There seemed to be little contact and information sharing between different the departments and agencies within the government, and between the government and other participants involved in developing aid. It was seen as a contradiction that people indicated that

information sharing was one of the main benefits provided by ICT. Some are still reluctant to share information.

When conducting qualitative research with interviews, the results depend on, and are influenced by, the researcher. This relates to personal characteristics, appearance, professionalism, experience, and the role taken. In this project, the researcher has been sensitive to these issues. Awareness and self-reflection of the role as researcher, this hopefully has influenced the process positively, resulting in honest results.

A cultural characteristic of the Lao PDR is peoples' avoidance of direct communication. Direct questions may be perceived as impolite. However, the researcher could not carry out the interviews without asking direct questions. Consciousness was taken regarding this. Meeting with the main contacts several times before the interviews established a personal connection. This contact may have given more personal answers from the informants, than what they normally would give to completely strangers. Additionally, the researcher has based the research on the research requirements discussed in chapter 3: reliability, validity and generalizing data in a qualitative context.

5.9 Chapter summary

In the Lao PDR there are positive attitudes towards the role ICT can play in the country's development. Spanning from high schools to the government, there is a general attitude that computers and the Internet will provide the Lao inhabitants an increased number of work opportunities, as well as means for sharing information, communication and entertainment.

The Lao Government can be a driving force in introducing new technology to the country. At the same time, there might be conflicting interests. Information is a complicated issue and not desirable in all communities. Others, like the UN, see ICT as a tool for making governments more transparent and efficient. Within international organizations, there is discussion on the proper boundaries to apply to the Internet, and the implication of freedom of speech.

Increasing human capital can be one of the solutions to the challenges Lao people are facing for technological development. Because of this, special attention should be given to the initiated efforts at the NUOL as well as the Internet Learning Centers.

6 Conclusion

This chapter sums up the essentials of the project. Throughout the previous chapters the main research question has been discussed to gain an understanding of what the current issues and challenges associated with ICT based aid are.

> *What are the current issues and challenges associated with implementing ICT based aid to least developed nations?*

In this chapter the sub questions will be give special attention:

> *a. How do high level strategic ICT aid goals get implemented at the field level?*
>
> *b. What lessons can be extracted from such a study to provide a conceptual model to improve ICT aid relevance and impact at the field level?*

The conceptual model, Country Designed Development Project (CDDP), refers to the second sub question and is presented in section 6.2. It is altered in the analyzed interviews and the literature review. Through the detailed presentation, the most important features of the thesis are summed up.

The model is first presented as a conceptual model, where the main components are thoroughly explained. Within the five main components the defining attributes will be presented. Some of the attributes will be explained, using examples, mainly from the Lao PDR. Further on, the model is presented as a country specific model. This illustrates how the model shifts from a conceptual idea to a specific presentation of a country. The Lao PDR is used in this exemplification.

The latter part of the chapter, presents various uses of the model. This implies including the model at the different stages of ICT based aid projects, from the initiating phase, to final evaluation, as well as being a tool in policy making. This will enlighten ways to *"improve ICT aid relevance and impact at the field level,"* which is part of the latter sub question.

Finally, the personal lessons learned from the project are presented, followed by suggestions to future work within the project.

6.1 ICT based aid

Through high-level ICT goals, the importance of introducing ICT to all humankind is emphasized. It is seen as both the means for, and results of, development. Developed countries are characterized by the emphasis they place on information and knowledge provided by ICTs. Developing countries, without real access to ICTs, are excluded from the information society. Providing real access, according to the 12 criteria presented in section 2.9, arrange for people to explore ICTs effectively and efficient. As discussed in Chapter 2,

inclusion in the information society has impact on a country's social and economic development.

Projects are initiated in the Lao PDR to provide Laotians with effective means for information and communication. The government acknowledges the importance of ICTs to the country, and they are currently drafting e-strategy plans to determine the prospective for ICT development. Different NGOs and governmental institutions are involved in ICT projects. Initiators have been presented in the thesis, including the Jhai Foundation, the STEA and the NUOL. One of the main challenges faced by the informants is awareness. This includes peoples' knowledge of ICT use and potential, especially among high-ranking decision makers. Other challenges stated, are human capital, lack of foreign language, technical skills, infrastructure, economy and legal framework. Despite the challenges, there are positive attitudes towards the role ICT can have in escaping the least developed country category. Through the eight National Socio-Economic Priority Programs, the need for improved infrastructure is addressed as a premise for development. The Lao government initiates the programs, with assistance from the UNDP. To improve infrastructure, focus is placed on modernizing "national and international communications and transport networks, including roads, bridges, airports and river port facilities, and to expand postal and telecommunication services in all regions" (UNDAF 2002: 26). The UN's goal to transfer the Lao PDR from a land locked to a land linked country can be achieved through the national programs, ICT development and e-policies, and grass- root projects.

6.2 Country designed development projects

In this section a model, Country Designed Development Project (CDDP), will be presented to illustrate and sum up the most important features of the thesis. The content in the model is based on the results from the field study and literature review of international plans and reports.

Like any project in the ICT business, development projects should start by outlining a requirement specification. This is carried out, to reassure that the final product or solution is tailored to fit the special needs of the institution and its users. Likewise, this is important when designing ICT projects for development. Such projects should always be designed to meet the specific needs of the people they are aiming at helping. If a project or strategy has proven to be successful in one country, it may not be the best solution for the neighbor country. Within countries this can also be the case, because conditions vary in different regions. Culture, climate, economy, education levels, geography, and terrain are important to consider when initiating such projects.

When discussing development projects with focus on ICT, one approach is to study what the end-users see as challenging when working with ICTs. Doing so, general trends can be revealed, as well as region specific challenges. This was the focus of the field study. The analyzed results discussed in chapter 4 and 5, presents the challenges the informants face when working with ICT.

Developing the model, attention is given to the results from the filed study. Also, the criteria for real access support the idea that it is not adequate to only ensure physical access to ICTs. Of the twelve criteria presented in section 2.4, these are found especially important to include

in the model: physical access to infrastructure, affordability, capacity, socio-cultural factors, economic environment (local and macro), and finally, political will.

Together with factors revealed in the field study, they are all represented in the CDDP model, Figure 18, within the five main components: infrastructure, economy, geography, education and socio-cultural factors. The chosen components and attributes are seen as the most important issues to be aware of when designing ICT development projects.

Following such a model, the researcher advocates that development projects are more likely to succeed. The project in terms of chosen strategy and technology, are tailored to the receivers, which may give sustainable aid projects. Why, as well as ways to apply the model, will be presented in the following section.

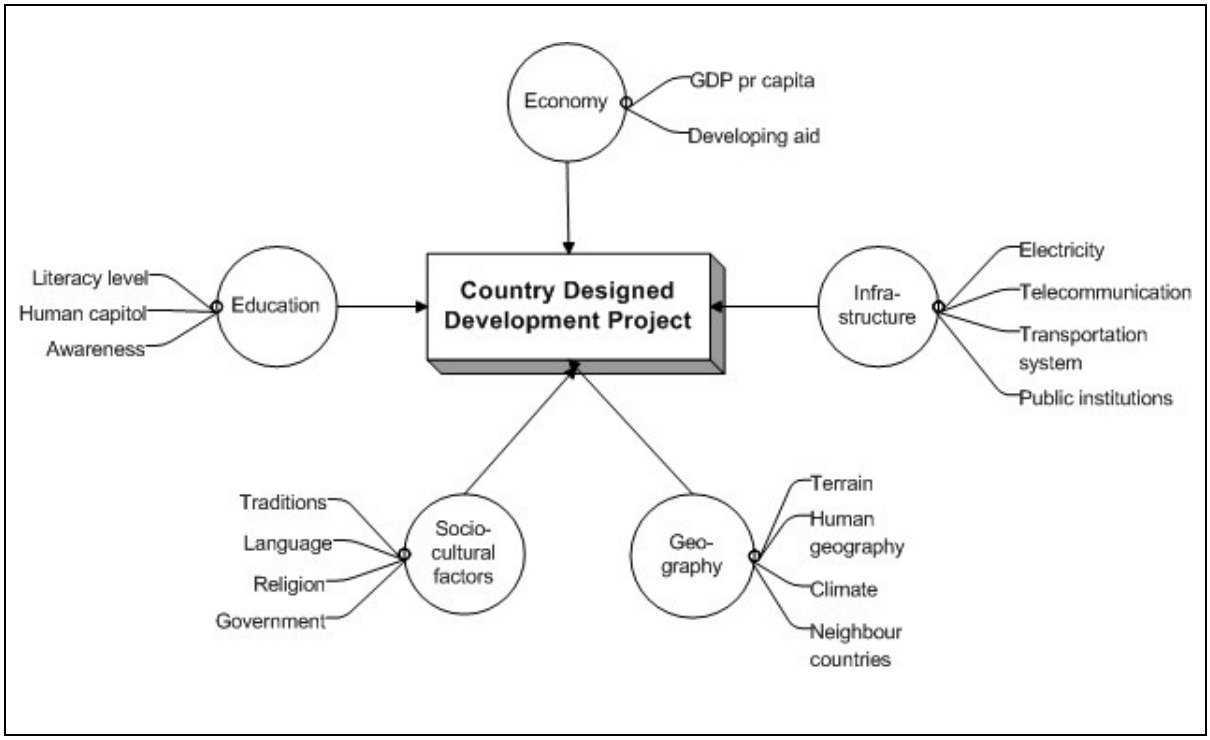
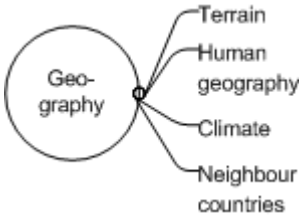


Figure 18: Country Designed Development Project

The five main components in the model are often interrelated. Infrastructure is often determined by a county's financial situation. Also, geographical factors, like terrain and climate, determine which type of infrastructure suitable in a region.

Following, the five components in the model will be presented. The attributes are discussed in general to give a better understanding of what they include. In addition, their relevance in ICT projects for development is discussed. Finally, the Lao PDR is used to exemplify the conceptual model.

6.3 Geography



The development level in a country is often determined by the country's location. This includes the neighbor countries and regional characteristics, in terms of climate, terrain and access to natural resources. In this section the four aspects of geography is presented: terrain, human geography, climate, and neighbor countries.

6.3.1 Terrain

Development projects that focus on introducing ICTs must choose appropriate technology that fits the country's terrain or topography. Whether the country consists of high mountains, plateaus, sump or islands, the challenges differ, and the choice of infrastructure must be made according to this.

Flat terrain
Regions characterized by flat land, have different options of infrastructure when implementing ICTs. Ground infrastructure, or wireless communication, may be proper solutions. Africa is a continent with large regions with flat terrain, with people spread throughout large parts of the continent. An example is in Senegal, where there are "generally low, rolling, plains rising to foothills in southeast" (CIA 2004).

Mountains
Another terrain type is high and steep mountains. Regions with this landscape, face other challenges than, for example, Senegal when building infrastructure. Ground infrastructure can be very difficult and expensive to build. This is also the case for wireless communication systems. Often, with such characteristics will not be high priority area when expanding electricity and communication lines. This depends on the population density, as well as the spending power of the inhabitants.

Islands
Other countries consist of numerous islands, making ground infrastructure challenging. One solution is to connect the island through use of wireless infrastructure. How applicable this solution is, depends on other geographical conditions. Sump land will face many of the same infrastructure challenges as island countries.

6.3.2 Human geography

The population density, as well as the human geography, is important to know when prioritizing which geographical areas to include in a project. The results from single aid investments will differ, depending on the density of the population. In high population density areas, a larger number of people may benefit from the investments.

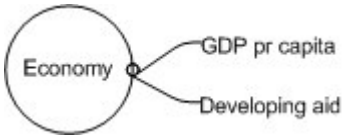
6.3.3 Climate

Climate should be considered when deciding on appropriate technology. Humidity levels might affect the use of electrical equipment. Humidity might break into the components, producing rust in the batteries and the wiring. Whether, or not, this should be considered, depends on the quality of houses. High-quality building infrastructure, with well-built houses and air condition, the humidity concerns will not be a major concern.

6.3.4 Country location and neighbor countries

Developing countries that border to richer nations are likely to be affected by the other countries' economic situation. Land locked countries should be given special attention. They tend to be more dependent on their neighbor countries, especially in terms of infrastructure development. About half of the poorest countries in the world are land locked countries. Remoteness and isolation from world markets might be causes to their poverty.

6.4 Economy



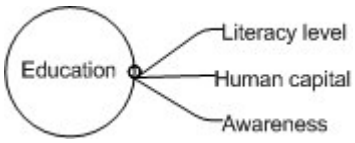
6.4.1 GDP pr Capita

To see projects in light of the countries economical situation is important to promote sustainable development. Low living standards affect salaries, which affect the consumer rates and employmentships. Brain drain is an increasing problem in developing countries, mainly due to low salaries.

6.4.2 Developing aid

In developing countries there are often foreign aid projects carried out by different nations and non-profit organizations. In the Lao PDR, there are initiatives that directly or indirectly involve ICT. Many places overlap and redundancies have been found (Chansavat and Sayo 2000). Strengthening cooperation among the government, donors, and the private sector, may have a preventive effect. Also, cooperation may give more sustainable projects, which will benefit the receivers. Over time, coordinated donor work might foster social and economic development. Approaching the field with this in mind will benefit the receivers, and give the receivers' higher expectations and ownership to the projects.

6.5 Education



6.5.1 Literacy level

Literacy levels indicate how large percentage of the population is able to read and write. The literacy levels in a country are vital for the usability of technology, and must be considered when introducing computer-based technology. If a low literacy level, a possible solution is to focus on graphical user interface, using symbols and pictures. Limited English language skills found in many developing countries must also be considered. Software programs in the English language, reduces the usability for such groups. As discussed in chapter 2, the literacy level in the Lao PDR is 52.8%. Almost half of the population can not read or write.

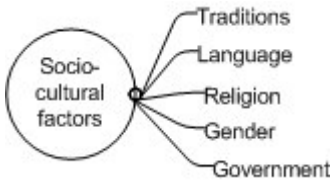
6.5.2 Human capital

Human capital indicates how well the inhabitants are doing in terms of employment ship, education and level of knowledge. Relatively high level of human capital is necessary to operate information systems, provide training, and maintain technology. In ICT projects in developing countries, it is common to provide training to the local inhabitants. They can be teachers, health personnel, or administrative workers. After completed training and implemented technology, it is common practice to withdraw from the project. This leaves the responsibility to the local inhabitants. For the sustainable projects, a certain level of human capital is needed. Education and training can contribute to this.

6.5.3 Awareness

Awareness relates to the target group's knowledge of the use and potential of ICT. Raising awareness should be done at the same time as educating the receivers in general.

6.6 Socio-cultural factors



Culture is a diffuse term, and there are ongoing discussions on what it includes. A definition is "the system of shared beliefs, values, customs, behaviors, and artifacts that the members of society use to cope with their world and with one another, and that are transmitted from generation to generation through learning" (Uofman 2004). In this manner, the attributes within socio-cultural factors are seen as building blocks of the culture. Religion, traditions, language, gender, and government and politics are seen as most important to consider in ICT projects.

6.6.1 Traditions

Some regions and people are known for historically being early adapters of new technology. In Southeast Asia, this has been evident, today visible in masterpieces from the Anchor Watt in Cambodia, to the scholarly literature in Indonesia. These both demonstrate how the inhabitants were early adapters of modern technology. Through their ways of thinking and building this is visible, which was revolutionary for the present time (Day and Reynolds 2000). Such trends can also be transferred to how people welcome computer-based technology. Another aspect of tradition is the awareness level of new technology. This is a complex issue, influenced by other attributes such as language, gender, country location and education.

6.6.2 Language

Language must be studied to make sure that the technology introduced will be user-friendly to the receivers. If low levels of English skills, other alternatives should be considered. One is to convert the software to the local language. Local language, together with extensive use of graphical user interface based on symbols, are two solutions to the language barriers.

6.6.3 Religion

Religion has an important role in culture, and influences peoples' attitudes. These attitudes might affect how people view modern technology and development. For instance, animists may have a different understanding of technological development, than a Buddhist, or a Christian. Religious beliefs are influenced by other socio-cultural factors in a society.

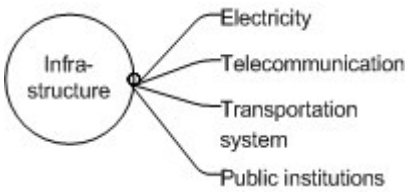
6.6.4 Gender

The gender disparity is important in ICT developing projects. The UN places great emphasize on ensuring gender equality in education. Further discussion on gender in development projects in general, is given in chapter 2.

6.6.5 Government and politics

How the government rules a country and the priorities they have, plays a vital role in promoting new technology to the country. Through education, ICT action plans and self-initiated projects, the government makes public its visions and priorities. In addition, they have power to control and influence foreign development projects. This indicates the important role a government has in promoting sustainable development. Discussion on a government's role in introducing ICTs was given in detail in section 2.10.

6.7 Infrastructure



Infrastructure is one of the most obvious factors that should be studied when initiating ICT projects for development. Gaining knowledge of existing infrastructure is vital for making technology choices, and deciding on area and receiver group.

6.7.1 Electricity

Electricity is required for using most ICTs. In areas without access to electricity, untraditional methods can be applied. This is tested and found successful in the Remote IT Village Project described in Chapter 2.

6.7.2 Telecommunication

If the chosen ICT includes access to the Internet, one was to access is through the telecommunication system. Awareness of the net capacity and range is important to determine how a project can be carried out technically.

6.7.3 Transportation system

The transportation system should be studied to know if extra equipment or resources is needed for transportation. If there are few ways of transporting people and equipment, other means for transportation, like helicopter, should be considered. This adds a considerable amount to the budget and is important to be aware of prior to the project.

6.7.4 Public institutions

ICT projects are often incorporated into existing public institutions like schools, administration and the health sector. Studying these institutions, the area with greatest demand for ICT can be found. The attribute “public institutions”, includes ministries and committees that are involved with ICT, through policymaking and projects. Including this attribute gives information of the division of responsibility among the actors, and their priorities.

6.8 The Lao PDR Designed Development Project

To exemplify the idea previously presented, the model has been applied when studying the Lao PDR. This provides a better understanding of the actual use of the model. Each attribute in the high-level model is replaced with Lao country facts. An example is to replace the replace the attribute, "GDP pr capita" with the Lao GDP, which is 1 700 USD per capita.

Figure 19, is a country specific version of the conceptual CDDP model. It gives a graphical overview of the factors to consider when designing ICT development projects for the Lao PDR.

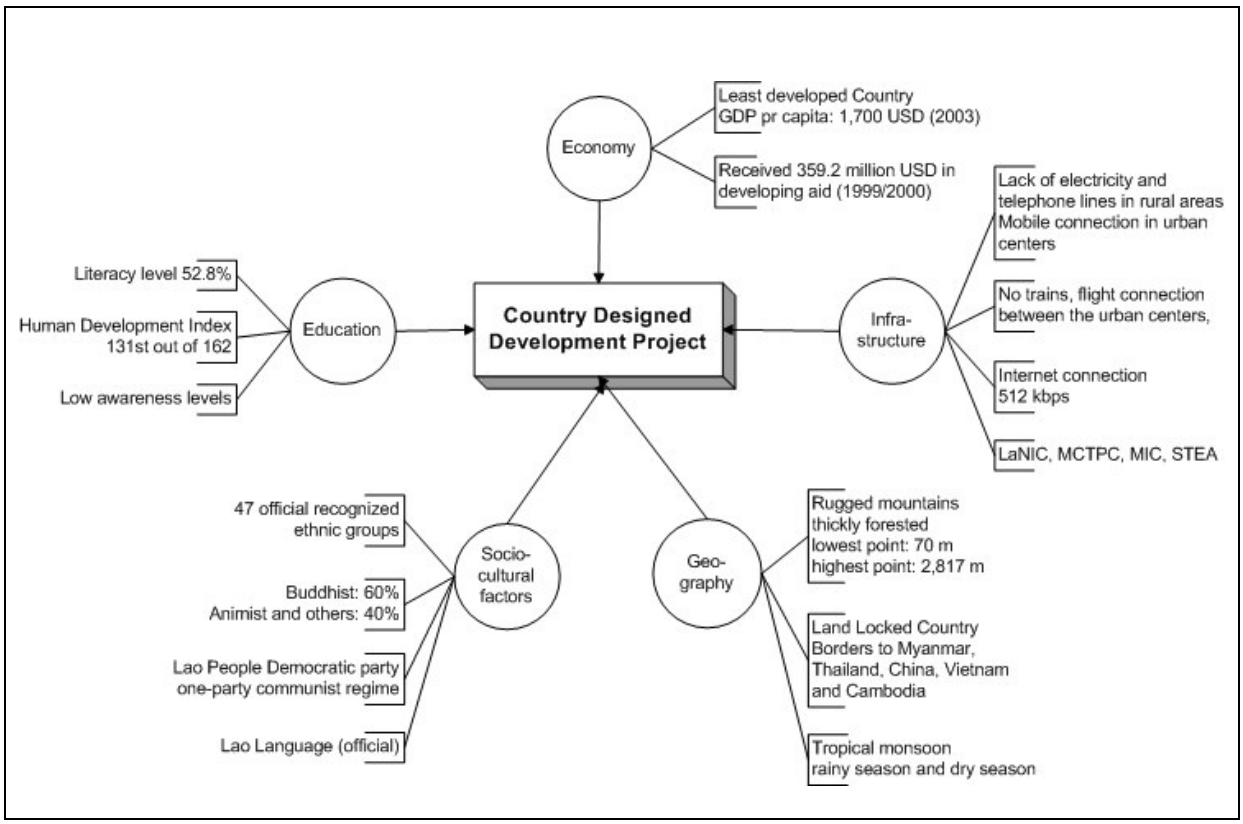


Figure 19: CDDP for the Lao PDR (UNDAF 2002; CIA 2004); (UNDP 2001)

6.8.1 Geography

The Lao PDR is a mountainously and thickly forested country. This implies special challenges when introducing ICT infrastructure, especially building ground technology.

As discussed in chapter two, the Lao PDR is a land locked country. Several of its neighbors are also developing countries. An exception is Thailand, where only 10.4 percent of the population lives below the poverty line. In the Lao PDR, 40 percent are classified as poor (CIA 2004). Thailand influences the country in many ways. First, the Lao capital is only 20 miles from the Thai border. Second, the public televisions channels in Thailand are also broadcasted in the Lao PDR and third, the majority of trading goods are imported from Thailand.

The climate is a tropical monsoon cycle, with dry season and rainy season. During the rainy season the air becomes very humid. The relative low building infrastructure is a threat to electronic equipment. If computers and other electrical equipment are not installed in air-conditioned rooms, the chances of corrosion are high.

6.8.2 Economy

With a GDP per capita of 1 700 USD, the Lao PDR is classified as a Least Developed Country. The majority of the Lao inhabitants do not have extra finances to invest in computers. One cannot expect them to pay high fees for using ICTs. Many projects focus on Internet/computer centers, where people pay small fees for using the equipment. With fees that coincide with the local peoples' economic level, such efforts can benefit many people.

6.8.3 Education

In the Lao PDR, the literacy rate is 52.8%. Close to half of the population does not know how to read or write. This makes interaction with computers challenging, as well as understanding any other written information, like manuals and instructions. Many ongoing ICT projects, aim at providing training and education.

Even though the target groups are literate, they might not posit the required English skills to operate a computer. Whether this is a problem, must be considered individually in each project. If the English language is a problem, local language or using English with extensive use of symbols should be considered.

In the field study, it was revealed that low human capitol and education levels were challenging factors for introducing ICTs. Especially, technology awareness was a main challenge.

6.8.4 Socio-cultural factors

In a country inhabited by 47 different ethnic groups, there are varieties of traditions, dialects and cultures. Knowledge of the target group must be gained for successful projects.

The official language in the Lao PDR is Lao. The younger population has some English skills learned in school. People schooled before 1975, have French as their second language, and this group has low English skills.

The majority of the Lao population is Buddhists; however a fairly large group is animists. Further research should be done, to see if trends exist in the religion, regarding adopting new technology.

In the Lao PDR girls are not equally represented to boys, in terms of schooling and literacy levels. The disparity is important to consider in all development projects.

In the Lao PDR the one-party regime reign, and their views are important to acknowledge when introducing new technology to the country. Why this is important, and the role of the government, is discussed thoroughly in section 2.10, 2.11.2 and 5.5.

6.8.5 Infrastructure

Wireless technology might be troublesome because mountains block the connection. To access and build ground infrastructure such as electricity lines, telephone lines and roads, is challenging in the Lao PDR.

Electricity and telephone lines exist only in the few urban centers. The majority of the population is located in rural areas. This results in most Lao people lacking access to electricity and telephone. Also, mobile phones do not have connection outside the few urban centers.

The transportation system in the Lao PDR is scarce. Public transportation includes buss and air travel. In 2003, there were only plans to build railroads across the country to connect the Lao PDR to its neighbor countries. More than 50% of the road net consists of unpaved roads. Low infrastructure and difficult terrain, makes introducing new technology to the Lao PDR troublesome and expensive. High levels of poverty, especially in the rural parts of the country, in addition to the low population density, leave the rural provinces as non-priority areas.

The responsibility of ICT policy making in the Lao PDR is given to the LaNIC, STEA, MCTPC and the MIC.

- LaNIC (Lao National Internet Committee)
- STEA (Science, Technology and Environment Agency)
- MCTPC (Ministry of Communication, Transport, Post and Construction)
- MIC (Ministry of Information and Communication)

6.8.6 Remote IT village project

The Jhai Foundation shows good practice in including the receivers in their Remote IT Village Project, as well as in the Internet Learning Centers. Infrastructure, terrain, climate, education and economy, are looked into before initiating the projects. When initiating the Remote IT Village Project, the initiators started by talking to the villagers about what their wishes were. Electricity, communication and water supply where the main desires stated by the villagers. The existing infrastructure in this area is scarce. There lack electricity, no telephone connection, and bad roads. Building up traditional infrastructure from scratch was looked into, but was too expensive for the foundation to provide. Still, wanting to help the villagers of Phon Kam, they were forced to think in new ways. The solution was to provide the villagers with means for information and communication, built with technology that fitted the conditions found in the village.

To reveal the village's conditions, the Jhai Foundation studied the terrain, location, existing infrastructure, economy and education, to assure that the project was suited to meet the factual needs in the village. The result was a special built computer that can resist the harsh conditions with high temperatures and humidity. Also, they developed the computer to run on rechargeable car batteries, avoiding the need for electricity. The Jhai PC was designed to meet the special conditions of Phon Kam. The technology gives the people means for communication and information that can leapfrog the rural village into the 21st century. Both projects are presented in-depth in an earlier section, 3.4.2.

6.9 Different ways of applying the model

It is especially important that ICT development projects succeed. Developing countries have generally few resources, leaving the receivers dependent on developing aid projects. Without, there are often no alternative solutions. The CDDP model can be useful during different stages of development projects, from pre-study, to evaluation. In the following section, the various applications are presented.

6.9.1 Preparatory work

Initiating projects in foreign countries, a careful study of the country should always be conducted. In this work the model can be applied as a framework for the requirement specification. The attributes in the model provide a list of vital issues associated with ICT development projects. Replacing the attributes with country specific information, the model shifts from being a general framework, to a country specific presentation of information that should be consider in further work.

6.9.2 Throughout the project

Continuously returning to the model gives the initiators a reminder of who the receivers are, and what their conditions are. At every stage in the process, one should return to the model and re-check if one is still on the right track.

Using the model in the pre-phase, as well as throughout the project, gives focus to predicting and assuring the successfulness of a project. These two applications can contribute to increased sustainability in ICT development projects, because the project always has the receivers in mind. Through the information gained, one gets an overall impression of the target group's special needs.

6.9.3 Evaluation

Unfortunately unsuccessful aid projects do occur. The model can be applied when evaluating what went wrong. Studying unsuccessful projects, gives valuable insight into possible pitfalls. Also, factors for success and sustainability can be revealed and given attention in future projects. Reviewing and reflecting on a project may be helpful to learn from the mistakes made.

6.9.4 Policy making and distribution of resources

Policy makers are often located in western cities like New York, Washington, D.C. or Geneva. Taking a macro perspective, they define general plans and declarations to be applied globally. They might declare it a general goal that every nation should be connected through the Internet. Further on, they might suggest how this should be done, for example by using wireless technology. Problems occur when executing these general goals in a mountainous country, like the Lao PDR. The suggested technology might not fit the country or region's specific conditions. The CDDP model can contribute to the theoretical approach, by giving focus to the diversity found in different regions.

Finally, the model can by applied when distributing resources. Take Statoil, a large international company. If they were to donate 1000 computers, to whom would they give them? When applying the model, they themselves or donor organizations, can assess which receivers are likely to benefit the most from the donation.

6.10 Summary

Throughout the thesis the current issues and challenges associated with ICT for development have been revealed. Based on the analyses of the interviews, together with literature on the topic, the CDDP model has been developed. The conceptual model captures the essential findings of the thesis. Its main components are infrastructure, economy, education, socio-cultural factors and geography. There are different ways of applying the model. It can be used as a general framework for the requirement specification based on country study. Furthermore, it can be used throughout a project to reassure that the project is carried out correctly. Also, it is applicable for evaluating aid projects, both successful and unsuccessful. Finally, it can be a tool for decision makers when defining high priority areas and general aid policies.

It is hoped that development projects that apply the CDDP model, will become more successful, in terms of impact and relevance. The knowledge of the receivers will increase, as well as the type of information gained. This may contribute to initiatives that provide the receivers with *real* access to ICT. Some of the attributes in the model, like religion and traditions etc., are often not valued as relevant in ICT development projects. However, this study has shown that these socio-cultural conditions are important to consider. They might influence how, and to what extent, the new technology is welcomed. Based on this information, one is able to define what area has the most prominent needs and will benefit the most from an aid project. As presented in Chapter 2, the areas thought to benefit from ICT are education, health care, farming and government and administration. The CDDP model allows tailoring projects to the receivers needs. It is hoped that this can increase successfulness in developing projects, and result in more sustainable investments.

6.11 Personal lessons learned

The research project with its various stages, from planning the field study, to completing the thesis, has been a fruitful experience for me personally, and as a novice in research. The various phases have challenged me in different ways.

The field study gave me experience in working independently. Because the project was not part of another project, there were no fellow students to consult and discuss with. The decisions were taken alone, or together with the thesis supervisor, Konrad Morgan.

The pre-phases of the field study, taught me the importance of being determined in my work, and not give up when facing adversity. Finding contacts in the Lao PDR was challenging, but eventually the efforts gave results. Determinacy has been important throughout the entire field study, to return with relevant information.

Finally, the project has challenged me as a person. Coming from the best country to live in (according to the Human Development Report 2004), the gap to the Lao PDR was overwhelming. During three months of fieldwork, I have gained knowledge of the Lao peoples' lack of infrastructure, human capital and economy. Simultaneously, I have experienced their unique personal and cultural qualities. Because of this the study has been worthwhile and meaningful to me. I have experienced a new culture and people, as well as gained insight into an interesting problem area.

I hope that the work I have done informs others of the challenges the Lao people face, and promote their needs. Hopefully, it will encourage to further discussion on what can be done in bridging the divide between developing and developed nations, including the digital divide.

6.12 Future work

The study described in this thesis is unique, but aspects of it could be repeated elsewhere. An interesting task would be to test the CDDP model in other field studies, carried out in other regions, with other challenges that the Lao PDR. In addition, the ways of applying the model should be tested. Testing the model in the various ways presented will develop the model further.

6.13 Attending conferences

The project described and discussed in the thesis is presented at two conferences. I attended the Norwegian Asia conference, NORASIA III in Bergen, Norway, September 2004. (http://www.asianettverket.uio.no/asiastudier/norasia3.html). The title of the conference was; "Power and corruption in Asia". Surprisingly, the Lao PDR was not discussed at the conference by others than me. Discussing the absence of the country with others, it was revealed that they did not know anyone doing research there.

Another presentation was given at the annual NFU conference with title; "Education, Knowledge and Development" (http://www.svf.uib.no/sfu/nfu/) (please see appendix E). In addition to the oral presentation, a paper was published, authored by Konrad Morgan and myself.

Attending these conferences has been a good experience to discuss the research area with others, and to meet with fellow researchers in the field. Given the chance to present my thesis twice, has provided me interesting feedback. In the appendix D, the paper is presented.

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> "Overførbarhet har referanse til om tolkninger som er basert på en enkelt undersøkelse også kan gjelde i andre sammenhenger"
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Appendix A: Questions and transcription of the interviews

Questions, group 1:
- Can you start by telling about your position/work/role here at STEA
- What do you see as the main challenges when working with ICT?
- What do you think can be the solution to these problems/challenges?
- What are the main benefits ICTs give?"
- How do you believe that ICT can benefit the Lao people? (Economically and socially)
- What is done in this field to benefit the rural population?
- By the year of 2020 Laos wants to get out of the category as a "Least Developed Country"
- Do you believe this is realistic
- What is being done to make it happen?
- How do you believe that ICTs can be used to reduce poverty?
- When receiving foreign grant aid, do you at STEA have any policies/requirements/restrictions concerning types of projects, commercial benefits etc.
- What are your plans for working with ICT the next year, next five years and the next ten years?

Interview with Mr. Keonahkone Wednesday October 29th.
//Could you start with telling about your position here at STEA? What is your job?
My job is within Science and technology but in Lao we also deal with information technology. Many people now accept information and communication technologies. This is the major dealing including the proposal for e-strategy which is very important for ICT developing in Lao. We try to participate in project formulations for any ICT projects relating to many agencies and policies.

//The e-strategy project: What are their main areas of interest?
We try to do some research and come up with forecasting in five areas; the development applied in Lao PDR. In the first year we did forecasting in infrastructure, telecommunication and infrastructure and promotions and industry. We combine together because we think that it is very important for IT development in Lao. We have a broad aspect to look at in this area. The second area we try to forecast in is ICT application because we think that in Lao we have to use ICT as an important tool for socio economic development in this country. The third is that we look at standardization and localization. In Lao we have an official language and we need to use the content to learn about this (?) We face problems because different agencies and the private sector use different standards. Then there are problems with exchange. So we have to look at this. The fourth area is human resource development. This is very important because we are lacking IT professionals, people within computer science, students.

//How do you deal with the human resource problem?
We develop some action plan to extend trainings for vocation training centre. Forecast ICT and propose to Ministry of Education to establish the department of computer science. We look forward to the possibility to open the computing course at the University in English language but we will see how the country is able to manage these things. And this will be open with/to the private sector to give updated plans (?)The last area we forecast is legal framework in ICT including cyber law, cyber crime, and Internet irrigation. This is the major area we will forecast. We will have some in our e-policy and e-strategy plan.

//Do you have any report concerning these five topics?

In fact we are in the process of compile the draft but we expect to be done in December. In December we should come out with a draft. We have been working four months already we in the working group which is compile from different groups in society, from the private sector from the government from NGO (Non- Governmental Organization). From each area and we sit down and work together to get some feedback (?).
Now we are in the process of all the five area because we want to compile into one report. First a draft and then a national policy and when we compile the report we give it to key people and we will include international resources (?) Maybe we can send to you and if you have time give your comments and we can share information an experiences. We hope to be done very soon by December. We are still working but we will have the national consulting on e-policy in January. When we have the feedback we will also invite some people inside the country to participate, some Lao people in a national conference concerning e-policy. And here we can use the feedback from the international partners. It will include both the national and international aspects.

//What do you see as the main challenges Lao is facing when introducing with ICTs?
First the challenge is the competency of on the one side what the Lao society is facing with the knowledge of ICT in terms of awareness. Not many people understand the how ICT benefit to the society. This is very challenging because ICT is a very complicated within science and technology. If you can use them properly it can be useful but if you can not use them it will give you more work. You know, that some times if you are not able to make it right you loose information. And this makes it more tiring. The same with Internet as well. Some times it will get frustrating. As you know we have not very good infrastructure. Some times slow speed. All of these things I think that we do not have enough support in.

//About the awareness issue. Do you have any concrete actions to make people aware of how useful it can be if it is used in a right way?
In the past we do not have very much concrete projects/programs, we have just in general. We have a national program and sometimes we organize it. Or sometimes the departments have workshops and invite the ministry, the private sector to come and participate in the seminar. And we also have a lot of support from NGOs, from international organizations who invite the Lao to participate and attend to international conferences and workshops many of them relating to IT. But this is more within law and management, but I don't think that we have much in the high ranking of awareness. For high ranking people to understand how ICTs can benefit the country. But we think that we should have some sort of improvement for the ICT policy for the high-ranking officer (CEO?) in Lao for the policy makers. Because they are the ones who make decisions….for the government…but I think that Laos is starting to be aware of how important ICT is to the country. As you know when you have visited Laos we have a lot of Internet Cafes. If you go to the public sector you see that they do not use computers. We have not been able to use computers in Lao because all computers are in Lao. What we are facing now is that the Internet cannot compile with the Lao language. So we need to look more into localizations because only the content on Internet would be in Lao so we can influence people from society and high-ranking people can use the Internet. Not very many people in Laos is able to understand the English language.

//What do you believe can be solutions to these problems/challenges you are facing?
We think that if we can implement, I think that implementation is very important and then we can solve some of these problems.
The first thing we think about is that Internet should be used by many people in Laos and to be used in Lao content. And in the five areas I told you about. We look at a master plan/action

plan for content. Very specific. And then we will develop pilot projects to meet the goals of our E-policy/strategy. Now we have developed some proposal for example for Lao content to be developed for, develop a package that is able to use Internet so people can send e-mail in Lao and view the Lao content in the browser. This is one of our projects that will be implemented in the next year. Many more projects will come after we pass the policy and strategy to the Government.

//Are you responsible for these pilot projects?
I am responsible for some of the projects, and I participate in the project proposal. And in project formulation some of our team does this. One of our projects now is E-governance. In E-governance we try do develop the information and management system for the government by using ICT. We want to speed up the process in terms of sending documents. We try to make a system to handle these things. And then we want to have a national database where we can share some information so the government can lock at any information that they want to see within different departments/agencies.

//How do you believe that ICT can benefit Lao people (in terms of social and economic development)?
I think that ICT definitely can benefit the Lao society. Because Laos had become a part of ASEAN for the Asian countries in the region and we want ICT for the ASEAN to develop in cooperation.
We believe that ICT can speed up new ways of learning in education as well. So we want to use ICT for information.
If we can we want the rural area to reduce the gap so we want to extend IT to the rural areas so we can the worlds more effectively. We have to prepare many things when facing ICT. We should be able to do this thing. Important is to…we have to ICT or else it is very hard for Lao to participate in the process of globalization.

//Can ICT benefit people in rural areas in other ways than for example people in Vientiane?
I think that if we have good infrastructure like telecom it would help people in the rural areas to catch up with new information and new technology and use long line learning. Even of they have markets if they have products they can open up to the urban by using ICT as Internet. We can have IT center for the communities.
In Lao we don't have enough teachers, lectures. It is very hard for us to teach people to use these new technologies like ICT, IT. So we should bring the remote villages to not equal but we should try to minimize the gap between urban and rural.

// Do you have any concrete plane for the next 3 years or 5 years?
For IT development in Laos? In some how but it's not official yet because it has to pass. First we have to pass the policy that we are working on now. When it is improved we can talk about concrete projects.

Written interview with Ms. Sisavanh BOUPHA,
Deputy Director General, Department of Science and Technology, STEA

1) The main activities are responsible for the drafting of National Science and Technology Policy and regulations related to science and technology management.
2) The main challenges Laos is facing when dealing with ICT are as follows:
    a. Lack of ICT infrastructure: education, R&D system, ICT industry and information networks.
    b. Lack of ICT networking: e-learning network for continuing education and professional courses links between university and business community.
    c. Lack of incentives to encourage innovation, research and commercialization and attract talented researchers to a life-long career in ICT.
    d. Lack of ICT qualified personnel and institutions for network management, software development etc.
    e. Lack of laws, policy and regulations on ICT
    f. Foreign language especially English and French are the main obstacles for rural people to get access to technology information.
    g. High prices of computers, scanners printers etc.
    h. High price of telephone communications and Internet access fee.

Solutions to the above challenges and problems:

- Classify ICT as priority in every sector and increase the application and development of ICT en every sector by ensuring high speed and good quality at low price. It should be considered an important factor of socio-economic development and ensure national defense and security.
- Establish the laws and regulations needed for information security and national defense and security in the future;
    - Computer related crimes
    - Consumer Protection Law
    - Copyright Law
    - Cyber Law
    - Electronic Transaction Law
    - Electronic Signature Law
    - Electronic Funds Transfer Law
    - Electronic Copyright Management Systems
    - Electronic Payment
- Invest in ICT human resources by integrating ICT in the curriculum of secondary school and university as well as professional courses.
- Encourage R&D and assist in building up the infrastructure
- Create tax exemption for computers and equipment aiming to ICT and development.
- Minimize as possible the Internet access fee and telephone communications in order to promote the application ICT
- Develop ICT industry with an emphasis on the software industry
- Strengthen technology transfer and collaboration between public and private sector.
- Combine ICT, biotechnology and genetic engineering in service of agricultural industrialization and modernization that will contribute to poverty reduction.
- Raise the public awareness and knowledge on ICT application regularly
- Develop Lao software to support the ease use of ICT for Lao people.
- The software should be compatible with Lao language

- Standardize information systems for exchange of databases and information system domestically and internationally
- Establish a systems of rewards and incentives to encourage research, innovation and technology commercialization for attracting researches in their careers by avoiding the brain drain of computer scientists
- Promote the administration of consumer benefits

How ICT can benefit the Lao people in terms of social and economic development?
Social development:

- Get the useful information for increasing the knowledge to be applied in daily work, research and education
- Change the lifestyle behaviour and can be communicated with other countries in terms of data and information
- Increase efficiency of staff through capacity building
- Get access to productive resources (land, market, transports, telecommunications will contribute to human development and social capital as well as to source of well being of the population)

Economic development:

- Generate opportunities for expanding economic activities, income and employment through the Internet.
- Human capital development is considered as one of the most critical factors of economic growth and poverty alleviation
- The inflow of technology at different level of local manufacture is closely linked with the development of skills and capabilities of the workforce on the licensee enterprise. Technology adaptation requires the capability to modify products and processes to suit local preferences, to get access to external market and to initiate innovation development in a specific field.
- The selection of appropriate technology is undoubtedly one of the key issues to be related to the economic capacity, production, market, resource and environmental conditions.

What is done in this field to benefit the rural people?

- Invest in education, health, sanitation and other services that can benefit the rural people.
- Reduce the price of computers and equipment, Internet access fee and telephone communications that will allow the rural people to increase the opportunities to ICT use and development.
- Find the cheaper ways (through radio-diffusion etc) to disseminate the information and data to the rural area how they can get benefit from it.

By the year 2020 Laos wants to get out of the category as a “Least Developed Country”.

I do believe this will be realistic if we can achieve the eight priority programs of the government and we concentrate on increasing the human capitol.

The following eight national priority programs:

1. Food self-sufficiency
2. Stop the slash and burn cultivation
3. Market production
4. Basic Infrastructure Development
5. Improve economic cooperation with other countries

6. Rural development
7. Human Resource Development
8. Development of the service sector

What is being done to make it happen?
A series of projects and action plans are being carried out through these programs

How do you believe that ICT can be used to reduce poverty?

- ICT is an important factor to knowledge-based economy in the area of globalization. It can effectively help to reduce poverty
- Invest in human capital for agriculture and rural development.
- Strengthen private research sector
- Give opportunities for improving access to and quality of education for the poor in rural areas
- Develop labour markets and infrastructure such as; electricity, irrigation and roads for reducing poverty among the indigenous people and improvement of economic conditions.

When receiving foreign grant aid, do you at STEA have any policies/requirements/restrictions concerning types of projects, commercial benefits etc.

We have already National Science and Technology Policy that was recently adopted by the government meeting since 15/9/2003. A series of projects will be followed according to this policy

What are your plans for the next year, 3 years and 5 years?

See the plan of S&T development up to the year 20 years, 10 years and 5 years adopted in February 2002.
The activities are focused on:

- R&D: basic research and applied research for applying production, industrial transformation education health and services in order to obtain products with both in quality and quantity.
- Technology transfer: Acquisition, assessment contract or agreement, transfer, adaptation, modification from local resources or traditional knowledge of people and through the importation of patents, foreign expert hiring, joint research with foreigners and others.
- Building up capacity of researchers and scientists: Basic education, innovation and creation in order to meet the local research needs in the period of socio-economic development. In addition, it should emphasis on enhancing the technical capacity of staff in grass-root production.
- Infrastructure: Invest in creating material and technical infrastructure indifferent sectors and local level such as: laboratory, training centre, experimental station to meet the need of research development in the nearest and long term period.
- Management of S&T activities: Planning, organization, promotion and control.
- S&T information services: Enhance the information network in different sectors with IT, capacity building on S&T information centre in different sectors with IT, capacity building on S&T information centre in different sectors.
    - Key projects:
        - Organization of S&T research activity in the sector

- Use ICT in different sectors
- Selection and technology transfer on renewable energy
- Promote talented people in technology
- Equip materials of S&T for research laboratory centre
- Improve and develop the organization of S&T activity at local level.

National University of Laos, Thursday October 2003-10-16

Interview with
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Mr. Bounthong Vonpxaya

//Could you start by telling about your work her at NUOL?
Head of IT center started 10 months ago and will be operating within 1-2 weeks.
Manager Information System
We deal mainly with the
The IT center is going to be used by both students and staff at the NUOL.
Focus is on basic computer/Internet training. Office applications
All the computers are connected to Internet. They are also building another IT lab that is going to have 100 computers that are open to all students.

The last 2 months they have trained some students in Web application and some students that will work as trainees.
This project is partly governmental and founding grant from (?) NUOL.
//What do you see as the main challenges Laos is facing when introducing IT?
Budget (we have a very small government budget) Trying all the time to get grants from foreign aid. Korea, Sweden, Japan.
Takes a lot of work because we have to write proposals for different grants.

Human Resources: We have very few qualified staff. Just now we have problems with the Internet, but no one to fix it.
Trainers. Not enough, Lack of English language

// How do you think IT/ICT can benefit Lao students/ Lao population?
It is not imaginable to do research or teaching of good quality without ICT. You need access to knowledge.
Through IT they can get more knowledge, and share research.
IT filed is changing so fast, that the books are too old. 10-15 years. It's not good enough.

Here at the IT center we have 11 staff members, but it's a big challenge for me as the boss to meet the goals because of the economy and lack of human resources. Because of the low budget we cannot recruit new staff/the staff that we want. We cannot pay the same as they do in the private sector. There they maybe get 10 times the salary. Here they maybe get 20-30 USD pr month, but in private companies they maybe get 4-5 000 USD per month.
It is hard to deal with our mission.
Brain drain: They train people, but don't have the economy to keep people working for them, it's difficult to maintain

Problems need to be solved on a top level. For us it's important to try our best, and do what we can handle bureaucracy.
We have only 20-30 USD but we don't want to work outside because we are patriots.

We have gotten education in Japan/Germany, but we both wanted to come back. Working for private companies the salaries are much higher 4-500 $ pr month. At the NUOL they get 20-30 $ pr month.

From the 10 months that the IT center has been operating they have done many things: Building infrastructure, servers, Internet server, Wireless connection to the other campuses, training.

Ass. Prof Mr. Oudone Phanalasy

//As I understand, you are concerned with the computer science studies here at the NUOL.
In the faculty we have four different departments. Physics, biology, chemistry and Mathematics and computer science. In the curriculum it is divided by 60-40%. 60% Mathematics and 40% computer science. Computer science is within the Math.
// within the 40% that is computer science, what are the topics covered?
The basic topic is programming, and you can look at the curriculum for more details. He doesn't think that the curriculum is in English, but they might have some handouts used in guest lectures.
//I'm not very familiar with the idea that computer science is within another field, in your case under the department of Math, do you have any plans on giving computer science status as being department?
In the future we have plans to divide in to two departments, but we don't know when. It depends on the timing and the marked.
//how many students attend the Math and computer science classes?
There first year at the department is their year three.
This year about 50 students.

//Mr. Phonekeo: They start by taking two general years at the NUOL, and then they choose a department. This year 50 at this department.
//Is there as many girls as boys?
It's half and half. The number of girls has increased.
//What do you see as the main challenges you are facing when introducing ICT here at the NUOL?
Marked demands are increasing the demand for computer science and in the area of IT. So we teach them computer science, and then they look for work
//so there is jobs waiting for the students when they finish?
Yes, there are jobs for them.
//Are they good jobs?
Yes, usually they get a good job. They work in companies,
//what kind of jobs do they get? Consultants, programmers,
Everything, programmer, Internet, etc.
//Anything you would like to add?

Dr. Phonekeo Chanthamaly

//Could you start by telling about your work/position here at the NUOL?
I work as the head of Research development or research promotion and cooperation. No, of course if we do research, if we want to support this activity we have to a good ICT technique to connect with international level. To find something or you want to do research. My position relate to ICT. As for me now, I finished in Semi-conduct from Japan, but I have no chance to do semi-conduct research so I work here as a administrator and support to make some surrounding conditions to support and promote research activity here at NUOL.
//Does that cover all fields?
Yes, that is for all the departments. I'm the person to change how to do research, making research methodology, and if I don't know some research methodology in some research, I have to cooperate with outside. For example from foreign countries, some researchers from neighbor countries, to give some lectures to our teaching staff, to learn how to do research for example in this field - how can we do research?.
Anyway, as I have learned in Japan, I have no experience about making research methodology, I just did research, I don't know how many methodologies there is. But I got PhD.
But know I came to do administrative work, I have to learn some methodologies (something slipped out here) and research suitable for some research topic or field, and spread to the other teaching staff.
//so you have to learn the methodologies your self, and then teach the staff?
No, I make research strategy, some policy, or some declaration about research at NUOL. Direction to do cooperation, to do activity.
//In what field do you think NUOL is doing best? Engineering, Architecture,
I think that because Laos is an undeveloped country, research about engineering, basic science, we have no policy on that because we are lacking budget. In order to do research in engineering, we should have very many experiments for example with computers, in experiment room, and things like that. But, the first priority is direct to research in the field of environment science, or forestry, agriculture, or social science or something like that. We should priorities in the filed of what we have (//in terms of agriculture) and doing that we have to have ICT to support, to connect to outside, to international sector.
//What is the main challenges or problems when introducing ICT

In Laos, because we are very late in developing, when talking about ICT, people think that it's only using computers, but in fact ICT is very wide, and very useful in order to do to high technology, to work with other countries in this world. But because people don't know what ICT is, in correct way, we need to educate them about what ICT is. Everything has two face (to sides to everything) one dark and one bright. Right? Low and high something like that. If ICT has some problems/something bad in ICT, but we use only the best/best way/good way. Now our challenge is to explain what ICT is. And ICT has some bade face. Everything has good and bad. Right? We have to use it. We have to go together with technology.
//What do you think are the bad parts of ICT?
For example using ICT for XXX associating, maybe use the Internet for nudity, pornography and thing like that. These are the bad parts.
We have many challenges to learn from Internet, to learn from ICT. We don't want to be afraid, and we are not afraid to only see the dark. We get only the culture from outside. I think we don't need to be afraid. We have to extract and to spread our culture, outside together, to exchange: Not only except. Both do it. But should be a donor not only except, exchange together.
But because of some in government, maybe some people are…they don't believe in the power. But for me, because I am an academic staff, I believe in myself to do best, to do it together, to exchange together.
//So you believe in the ability that people can take the good part from Internet? Yes.
//Are the government planning on…when talking about the Internet, going to use the One-Gateway? Are they going to shut down the bad pages? I have heard that government want to have only one gateway. Before they think like this, another gateway was active before this one/this strategy. For example; dropcom, LaoTel, STEA and another. But how can we dismiss these gateways? Because happier people with this strategy. They are only talking now, but nothing in activity.

//One more thing I thought of: How do you think ICT can help, you know Lao being a Least Developed Country, and by 2020 they want to come out of this position (MDG).How do you believe that ICT can help people out of poverty?
At least we can connect out concern to ICT. We should know what and where we are now, and what we are doing now. And then we can compare to other countries, other international associations.
So ICT, technology, we should know how we are, if we need to run or walk slowly.
And also Laos is a land locked country, it is very hard to connect with outside, for example culture or outside economy, environment.
For example in poverty Laos and Thai is on the same level, but because Thai is south they have see to connect, economic…western countries. Shipping etc. Then Thai will develop faster than Laos. Laos has been a very weak country, and we become weaker. That's why we have to…we should have a good reason to see the world, and see how other countries are doing with ICT.

//Do you have any policies towards for example the KOICA, or other foreign aid donors. When they want to come here and support you, with different infrastructure, do you have any policies for what they can do; can they do whatever they want to?
We have no exact policy. Because it's depending on government. We can not have policy, like we for example should get only KOICA, and not Sweden. We have no policy like that. We just try to join together. But we can not join, because every project is on the faith (?) of the donor. And we are acceptor country, we just accept. As much possible as we can do. And then we have some problems, we accept. Only accept. But we don't know. What field, what

method we should accept. For example the supporting for this is from JICA, and the support for this is from SIDA.
We have no policy for this…because it's depending on donor. For example if we want JICA to support this one and they say "no. I don't want to support this, but want to do this", we accept, its better than we don't have anything.

//Do the donors get any advantages here in Laos? Like commercial benefits, television. For example IBM, Microsoft. Does it occur that they want something back?
JICA is the biggest donor to Laos. JICA has full XXX to assist Laos, one is human resources. Another is basic human need. Education, and…facility...and infrastructure, agriculture, forestry, environment. These are the main areas. SIDA has very wide policy to Laos, for example, agriculture, forestry, some education.
But now we don't have support from for example Microsoft.

Interview with Mr. Vorasone Thursday October 30th 2003
Country Coordinator, the Jhai Foundation

Talking about the pictures:
This is the antenna and this is the pole for the lightening protection. Here were tuning to faced up to the tree on top of the mountain.
Here is one gentleman from MPDF. Mekong project Development facility. They found us. They give us 50 000 USD.

Launching day February 2003: People from all over came, from the surrounding provinces, newspaper staff, US visitors. Over 100 persons came. But two days earlier the system failed because the flash disk/card (hard disk, memory) burned out because of all the testing. I think it was because of the power testing. It uses 12 voltages. After the army asked us to stop and we tried to negotiate we found out that it will take some time. Then we decided to ship the computer back to US for a new flash disk and to improve and update. The JHAI PC is built with 468, and now we are updating it to Pentium.

Why we chose 486? It consumes less power. And we wanted to meet the local needs. 64 Mb RAM. After that we have foreseen the different uses we decided to update it.
It uses a Lao Linux operative system.

The computer: The computer with JPC. LCD screen, Telephone, printer, keyboard. Lee Frelsenstein is the head of…and built /invented the JHAI PC. He is the key person. He is also the one who invented the first laptop called Osborne1. Check "tech museum awards, San Jose, California".

We have three bicycles. One imported from India (the blue one) one new one and one we built locally (the green one). Even an ordinary bicycle can be used; you just need a crank to set the back wheel in. We have one special bicycle (the blue one) made for this and it has only one wheel in the back.

The Jhai helped the village to write proposals to get founding for the school and connected them to the International Women Union. The computer room was built by Jhai.

For the first testing we used laptops. I was able to call to the US and to Sweden and to Lao.

The water tower belongs to the Phon Hong district hospital. We asked permission from the public of health to install our server in the tower. This saved us for building another tower. In the tower we bring up electricity, a JHAIPC, two telephone lines through the JHAIPC. All JHAIPC look about the same but this one is supported by electricity. Here we also have lightning protection

The antennas at Phon Kam connect to the relay station (the tree on top of the mountain) and from there to the water tower in Phon Hong. The relay station has two antennas. One facing the village and one facing the water tower.

The relay station is located at least one hour though trekking from the telecom tower on top of the mountain. Here we have to carry all the equipment and it is a lot of work. The case for the battery was very heavy and it took 4 people to carry it. The same with the battery. We needed the case in case of thieves. Here we try to fire up the two pieces of solar panel to the top of the

tree which is 30-40 m tall. On the tree we have two platform. The first one is for the solar panel and the second is for the JHAIPC and the antennas (one-direction and wireless). We use the wireless because we are looking for four more villages (total number of five) to connect. For testing here we used three laptops to find the place with the best connection and one mobile phone.

Here they set up 24 lightning poles around the tree to the ground. For this project it took about 15-20 whole working days. It took 2-3 days just to find the right tree with the best possibilities for signals. And then building the platform also took a lot of time.

//Why did you choose Phon Kam?
This issue concerns the founder of our foundation, Mr. Lee Thorn and Mrs. Phontanh Phompasapit. Mrs. Phontanh Phompasapit is the daughter of the Phon Kam village. Originally her family came from Xieng Xuanh in the northern part of Laos. The part of the country that got bombed a lot. Lee Thorn was the bomb loader. So after the two of them met in the US they shared experiences and got to know each other. They talked about the hard times during the war. They came to Laos and wanted to do reconciliation. That is why the project is starting in the village of Phon Kam. Mrs. Phontanh Phompasapit is now working in the US and is the co-founder of Jhai Foundation.
After they came to Laos they visited Xieng Xuanh and Mr.. Lee Thorn saw the bad things/damage that the Americans had done to Laos. So he wanted to help and do something good in return. And they would like to start from Phon Kam village. This question we have been asked many times from the government. Why Phon Kam?

First we want to connect five (or four?) villages and then we want to expand more. We want to cover all area down to the Mekong. If you look from that village and down to the Mekong it's less than XXX km. First we want the one in Phon Kam and then five villages and then extend even more. We see that it's more open over there and that's good for communication. It's harder in flat area like this.

//When we visited Phon Kam last weekend we noticed that there were electricity lines going through the whole village. But still they don't have electricity. Why is that?
Just recently the people in the village have traded electricity for their forest. They cut all the trees in that area to exchange with electricity. So the local people with agreement from the government have cut down many trees in jungle in exchange for the company (EDL) to bring in electricity. In the beginning of this year they started putting up the poles now cables but they are still waiting for the transformer. There is no money. Once they have money the transformer will come. First they traded for the pole, then for the cables and now for the transformer. This project takes a lot of time. To come so far it has taken 7 years. Before they started setting up the poles they had people working for them 4-5 years.

Before we started our project we asked them what they wanted. And they said electricity. And they wanted water, roads and they wanted telecommunication. So they say road and electricity. That's too much money for us because we are a small organization. But the water we built. We built four wells in the village. The one in front of the school was the first one we built for them about 4-5 years ago. Last year we built 3 more wells.
And then we have telecommunication that they wanted. So we asked them? What do you mean with telecommunication? They said: telephone, to communicate with other people, local trading, communicate with foreign cousins, to promote their trades, the weaving products and

agriculture so they don't need to go to the city or get cheated by the middle trader. Another thing is that telecommunications will help them if they are sick so they can call for help. The busses don't go very often. If it's an emergency they have to ask for favours and maybe pay a lot of money.
So we thought. What can we do? I personally went to see the telecommunication officer and asked him to forecast the price for bringing telephone lines out there. This would cost over 100 000 USD. So we discussed with Mr. Lee and he thought of; what about connection over Internet? We had meeting with them every 6 months for planning. Want to use Internet for calling for exploring and communicating with the world. That's the idea. But how do we do it, Internet without any lines and no connection? So Lee said that I he would think of how to do that. So he had to create a new machine. We named it according to our foundation. He volunteered to do that (Lee Frelsenstein). He invented it but the idea and the PC belongs to the JHAI.

The Internet Learning center in Phon Mi is open to the public. Many clients come from other areas, some work in hospitals, staff, and private users. The center needs to make money. For students it's free but for other they have to pay for the use. After the school hours and in lunch hours they charge people for the use.

When we hand over the ILC's to the school it belongs to them 100%. They give up monthly reports on how it's going.
We support them with everything for about two years. But if we see that they are managing on their own we stop sooner. But we still keep follow up with them how well they are doing. If they have any problems we help them. Our wish is that they keep the centers running and growing. This is what we are hoping for.

//Do you know how they are doing now?
They have been doing well. They can take care of the center financially. They keep on providing training to the staff and the students. It's good help for the school. They don't have to invest more money to send their staff to learn how to use computers. And also the kids. They have a place to train. I think that's a good help to the society and to the school. Most of the schools don't have computers. Very few have. In terms of managing the projects gives the teachers the chance to learn how to manage their own property. How to manage the investment that we made for them. So they can learn how to become the business leaders. The project will not make them rich but they have the planning. We hope and think that in five years they can have more room and can buy more pc. From the report we see that they have done quite good. But not the same. It depends on the area. I see that in the city they have a higher income that in the countryside.

//Do you think that is because people have more money here in the city than in rural places?
Yes, it's the culture. In the countryside before you spend 10 000 kip you think 10 times. But here in Vientiane you maybe think one time before you spend 10 000 kip. The cost of the Internet is much the same. The expenses are about the same but the incomes differ from the area. The price for using the Internet might seem reasonably in Vientiane but expensive other places.

//How did you get involved with the Jhai foundation?
My self, I was the first graduate in computer science of Laos. Being the first graduate the Ministry of Education assigned me to be the lecturer of computers at the National University of Laos. At that time there were different national universities. They reformed in 1997 and

made one National University. Before that there were many separate colleges. Our one at Sokpaluang was the biggest and was called the "polytechnic institute" (?) and was the highest one. But because that is in a small area that is why they moved the center to Dong Dok.
So I was the first person that developed a computer center at the National University. The National polytechnic institute. And I developed the curriculum for engineering. I worked for the National University for about 10 years and then I resigned. The reason was because of economy. I could not afford to take care of my family. The salary was too low. Both my wife and I earned about 20 USD pr month, but expensive with a family about 200 USD. When I resigned I was employed as an EDB consultant/programmer at the Ministry of Social affair. After finishing there I worked for the Ministry of Education again as an EDB consultant in new projects. And then I worked for different international organizations like EU, JAICA, and MicroTech computer.

And then Lee came to Laos in about 1998 and through my projects he got to know me in 1999-2000. Any time I worked as an EDB consultant for Ministry of Education and also part time for MicroTech. He brought medical supplies to support Laos, 14-15 containers. This was supplies for less than 1(?) million USD. They needed someone to make a database for stock control for the medical supply. So he signed a contract with MicroTech computers and they signed contract with me to make a database program for them. So I did this in my spare time at home. When I finished I went up to the District Hospital in Phon Hong to install the software that I made. This was in both Lao and English. Then I trained the staff and Lee came and he saw me and he asked me if I was his hired staff. And I said, No, they hired me. So we started talking about the price. And we found out that he paid the company double of what I earned. So then he said; next time then I can hire you directly? And I said yes! After that we worked for about one year. But still he paid me through the company. So then he got to know me and he hired my many times. After one year he asked me to come and work for him, to resign my job and take full time job for him. This I considered for about 6 months. My main concern was "what is he really doing in Laos"? The salary is about the same but if I came here I would be the person in charge of the project. Over there I was a consultant and I had another boss. But the main thing is that this is a good project. He is a foreigner. He tries to do found rising to help Lao people. And I am Lao and it's a good project, a good person and a good idea. I should do this. For my old work they could find someone else to do the job. So I decided to resign but I said that I had to find someone to replace me. So I had to go and ask my friend to replace me. So in about 2000 I started working with Jhai directly. Before that I worked with him through my company.

//How do you think it's going now with the Remote IT Project?
This is very sad to talk about. Honestly I have very little hope to get this project continuing on the same place/same location because the army does not want us to be involved and work in their army camp. They don't mind that we do our project but they mind if we do it on their site. This is not within the authority of the Ministry of Education. Ministry of Education and Ministry of Foreign Affairs have authority to allow us to do this project but not where to do it. For the location we have to ask permission from the party that has authority, which is the Ministry of Defense. We are waiting that in about 1-2 weeks for the final decision from the highest decision maker, which is the minister of defense. I submitted the request from our foundation to them.
The local army officer already said that they don't recommend us to be involved in that area. But we still don't want to resign yet. We want to explain more. I wrote about 3 pages in the report of the reason why we want to do this. We have already invested in this and we have the

connection and we have permission from the villagers. Our project didn't start yesterday. It started many years ago. And we don't want to just stop and move away.

//What do you see as the main benefits Laos has from using IT?
The main benefit is to link Laos to the word, or bringing the world closer to Laos. This allows anyone that is an Internet user to touch by themselves not by second hand or third hand connection. They can explore them selves. At the same time they can share inputs and pass on their knowledge or lessons that they want to exchange. That would be great influence in terms of business and help Lao business to learn and to share and to trade with international traders/companies.
If we want to develop ourselves in terms of economy and technology I think we have to use this. But at the same time the government and we as NGO in Laos should help with protecting the Lao culture so we don't lose our culture. Of course at the same time the Internet is also bringing negative effects some negative news and lessons for the kids who have less experience/knowledge to learn. They don't know what to learn. If we are big enough we can chose ourselves what to learn and what to see.

//How do you think that Laos can deal with these negative effects that come with the Internet?
We mean that all agencies that allows to use Internet for the local user should help in advertising, brochure which websites and things to learn to do. Encouraging, promoting, that's what I think that all parties should be involved in including us. Not only teaching about the good things with the Internet but we also have to point out the bad things. We the users should learn how to use it. Everyone should be involved in doing this. It is public education. Not only the government. They cannot do it alone. We, everyone who have more experience and know this should tell the younger students/the new users of the Internet.

//What do you see as the main challenges/problems when introducing IT?
The main challenges are to make the decision makers, the high-ranking officers to understand why. Because those people are the people who have more power. They have power and influence to cut off or help us, to allow us or not. If they don't understand and get along with IT that is introduced to us the IT technology will not be allowed. For example in the local, in the Vientiane capitol city it's easy (not very easy but quite easy) but if you want to introduce ICT to other provinces it's something else because the high ranking officer maybe doesn't have enough knowledge about IT and doesn't understand what IT means and the benefits and the positive and negative of IT/ICT.

//What do you think can be the solutions to these problems/challenges?
If I was in an International Organization like the UN or people relations I would arrange seminars and training and bring in the high ranking officers, local government set up in different places, different provinces. First we have to educate and train the authorities' people. Make them understand before you introduce to the people like their staff. Otherwise they don't support what you want to do. Same like our projects. The civil officer (?) says ok, we have written permission but army said no; and what can we do? So I can see that all authority have to know how to know the organization. The donor has to be one step ahead and provide training to them. Invite them to come and provide the training for them. Tell them what the good things are and what are the bad things.
If you want to ask me why the government in Lao wants to do? They don't have enough found to do. I don't think they even have enough money to train on their work. And this is not a high priority to them. They have more training to do with the local offices. So I think if foreign organization or International organizations would like to bring ICT to Laos faster then

first you have to start at the top level. Before you start ICT with the staff and then it gets blocked. Maybe they say; Oh, what are you doing? What did you send to whom? How did you get permission? That's the outcome.

//In what way do you think that ICT can help to reduce poverty?
In one way within communication; telephone call, Internet call.
In this way they can communicate with their cousins or distant family and connect with them and they can develop some help, communication, training or whatever that could bring us a lot of things.
In Lao culture we like to help each other. When family dies or for building a house they call their cousins. In this culture we help each other like sending money. I know that that's not the western culture but Lao culture we help each other by sending cash or whatever. This brings a lot of income to Laos. If you about South East Asia. The money from the people who work abroad, they send money back to help their family. That has helped Lao economy a lot. I believe in that.
Certain parties when they bring ICT to Laos they bring a lot of facilities in communication that will push the telecommunication prices down. That is a big benefit. Even now with Internet calls. It's not very official yet but it is used sparely. But Lao telecommunication cannot stop them. That will help the public.

Another thing is that it will help the next generation here in Laos to catch up with the technology and be able to go and stay abroad. They can learn from Internet. They can learn how computers work and at the same time they can make friends and contacts.
It will also help with facilitate in business private and also for the government in terms of faxing, sending e-mails, scanning pictures, sending/attaching data between different offices. These kinds of facilities will help a lot. And at the same time I see with our project. If this is approved properly from all agencies then we expect that Lao in the remote area will have the connection to the city and to the world. These kinds of projects like our Remote IT Project mainly you can set up similar projects that connect them through the Internet while the remote areas have to wait for telecommunications to expand their connections and stations. And then ICT will do another great hand to the poor people in remote areas in Laos with the mountains and is considered not worth for the Lao telecommunications to expand to. So this will be a good help.

//What is your plans for the next year?
We plan to build more Internet Learning Centers about 8-10 new places within 6-7 provinces in Laos. We try to continue on our remote IT project. Why? Because this project is unique and creative. And we believe if we can do this remote IT project complete successfully we can convince all the government once they see the product and the efficiency. But at the same time they will se that it creates some forces to the Lao telecommunication. That they might rethink about the locale people using the Internet. This will create some issues for them because they will loose their income for calling outside of the country. Since they cannot provide this service to the remote areas what can we do? But I believe that in this issue the government will support us. This directly supports the users, which are the people. We are only the organization who facilitate/build technology to be presented for them. They are the owner of the properties we are only the facilitators.

What are your plans for the next 3 years and 5 years?
Our long-term plan is that we want to link Laos to the Internet. Everywhere. If we have money, if we have the found. That's my long-term project for 10 years or even 15 years. This

year if we connect 6-7 provinces more it will be about 11 provinces (total 18 provinces). So 18 provinces does not link all of Laos it only links one school in one province. That's one school in each province. But in every province there is many schools. We need more time and more founds to do that. We will start with one school pr province. That's very small if you compare to that all over Laos there is over 3000 high schools. We build 4 and that is nothing. There is still a long way to go and that is one of our objectives.

Our second objective is that we want to help promote Lao products to the world. That includes coffee, handicrafts, weaving. We want to help the poor people to be able to help themselves. We want to start from the remote area and not the city. That is our objective. Whatever we can help with we do. We go to this village and they want to do weaving. Ok so we bring in a trainer to train them. If they need some found we see what we can provide them. We go to another village and they are strong in computers and we help them with that. We go to Pax Xhong where they have good coffee. We bring in the quality control and help them to start growing and turn them to organics. They are organic but not 100%. Near the village, near their home they use chemicals. Next year project we want to turn Pax Xhong to be a certified organic farming and the factory project. These are both within our two-year project. And we have started already.
The aims for our foundation are to help the poor people to be able to help themselves. We don't want to stay in the same village all the time. After this one we move on to another village. We give a found to the village and give the women's union to manage the found. So we do many things at the same time. Many small things within economic development.

We have health, development coffee and IT. These are the four areas that we are focusing in Laos.

We invest a lot in the remote IT village. The people who have been working on it, their salaries are so high that we cannot pay them.
Lee and I have done a lot of work to get them to believe in this project and volunteer to help. Imagine that you go to someone with wages that are 300 USD pr hours and ask them to work for you for free. That is not easy. That's why I feel very sorry that the project has stopped. It is very sad. We will see what the outcome is.

Interviews at Phon Mi High School Tuesday November 18th 2003

Mr. Keochay SENGPHAYTHOVNE

Duty is about control the computer room and communicate with the government.
10 hours teaching, 6 hours computers and 4 hours geography.
They chose students with the best scores and the ones that want learn about computers can apply.
15-18 years old
250 students get computer training.
1640 students total.
This is the only school that teaches computer school in Phon Mi (?)
3 years of school
He has been working here for 3 years
//How did the work with Jhai start?
The school got the computers in May 2000.

//Is this computer room open to the public?

From 12-13.30 the computer room is open to the public. Training courses in word and excel.
// are there many computers in Phon Mi?
There are some computers 3 km from the school.
//How do you believe that Phon Mi high school differs from other schools in the region?
The difference is that this school is bigger than the other schools and is controlled by education of this province and is located near the main road. Many people want to attend the school.

//How do you cover the expenses at the computer room?
Open courses and people pay to participate in the courses.

What are your plans for the next year, next tree years and next 5 years?
The plan for the future is to make a website on Internet for the school.

//Problems/challenges when working with IT?
Problems they have when working with computers are hanging computers; difficult to control the mouse (because of dirt?) and Internet connection is not good (Lao Telecom is not good enough too provide connection to the Internet)

Solution: (Here he answers about how the Jhai solution is)

This solution is good, it's good for the students to learn and learn about computers and improve themselves.

//How can computers benefit Lao people (be good for Lao people)?

Computers are very good. The technology
Learn and communicate
Communicate
Learning and education
E-mail

Mr. Bounnong SIHALATH

Has worked here for 2 years. He teaches 15 hours pr week in both computers and in English.
//What is the main problem/challenges when working with computers?
Problems with wireless connection because the computers are too old and some programs disappear when they use it
Sometime we can use the server for Internet. 10 computers and one for Internet.

//What is the main challenges Laos as a country when dealing with computers? (misunderstanding)
Good for the Lao people to know how to use a computer
Modern way of doing things
//but what are the problems?
Lao people cannot make computers.
It is very good for the Lao people because in work they can use computers for communication like Internet calling.
//How can you solve these problems?
Yes.
//How?
Lao people can be good to solve the problems.
Lao people don't understand as quickly how to use and repair software

Questions group 2:

1) Why do you think it's necessary to know how to use a computer?
2) What do you like the best when you're working with the computer?
3) How many hours pr week do you use a computer?
4) What do you use it for?
5) Where do you use computers?
6) When you use the Internet; what do you use it for?
7) When you first started to use computers, how did you feel?
8) How do you feel now?
9) What kind of job would you like to have when you get older?
10) Do you think computers can be useful then?
11) How do you think that using computers can give people better lives?
12) How old were you when you first used a computer?

Student interviews at Phon Mi High School

1) Mr. Sitthicleth (16)
We learn computers 2 hours pr week. Sometimes I use computers other places. Sometime I use computers at computer shops.
At computer shop I compose drawings and writing.
Does not use Internet
Use it to write and make drawings and answer my homework
First time 14 years old
Liked it very much. No I don't study computer so I only use it sometimes.
Wants to be a construction engineer
Can use the computers to make drawings and models of houses.

//How can computers give people better lives?
Computers can help people to do anything, make people to know other people from all around the world through Internet.

2) Mr. Vivasack (16)
Good, Enjoy to use computers
2 hours pr week at school. Don't go any other places
Use Microsoft Office because my house is a photocopy centre
Sometimes to do homework
Use Internet to send mail
First time 10 years old
Really like computers
Want to be a computer programmer
// Help people?
Good for communication and education

3) Mr. Souphamith (17)
Computers are very important for us and it is very interesting to use and to work with
2 hours pr week, only at school.
Does not use Internet
Use Microsoft Word. Not for homework
First time 15 years old. Was very happy. Still like it
Want to be a truck driver
Computers make Lao people to have modern knowledge and makes Lao people to know about computers and to know how to use Internet and other applications.

4) Ms. Soukphanna (16)
Interesting to learn about computers.
It is good for her education.
2 hours pr week. Only at school.
Word explorer, and excel
Use Internet only sometimes at school. Has e-mail. Maybe for homework
First time 15 years old. Liked it very much. I love to learn about computers and computers help me with my work. Makes it more easy. I would like to learn to learn computers forever.
After I finish high school I want to work within administration. Can use computers then.
Sure, computers can help people to know many things and improve education.

5) Ms. Anong (16)
Very interested in computers and Internet
Use it 2 hours pr week at school
Use it for word and excel and sometimes for e-mail
First time 14 years old. Very wonderful. Still like it.
Wants to be an English translator
Can use computers in many ways in work, Internet, connecting people.

6) Ms. Chanthaphone (16)
Very good with computers for working and communication
2 hours pr week only at school
Has used the Internet only once and liked it.
Use word in the computer classes and for homework and studies at school

First time 14 years old. Liked it very much. It is very good for me for work
Want to be a doctor
Yes, if it can help
Translate for documents
Search for old information.

Interviews at Vientiane High School Monday 27th of October 2003

Mr. Saming Donmalay
//Could you start by telling about what you do here at Vientiane High School?
His main duty is teaching, he is a teacher so his main duty is teaching. His second one is to be responsible for 3 computer rooms, one room is the center, and this is the second room given by the KOICA, Korea. The next one is from Friends Donation. So he is responsible for three computer rooms.
//How many hours pr week do the students/pupils come to the computer rooms?
For the students we choose only 50 students from the 5th level (The final level at the High school is 6th). The students are 15-16 years old.
They use only 50 students from the fifth level and they will have the course for 10 hours pr week. For one course is 190 hours.
// How long have you been working here with the computer program?
He has been responsible for two years.
// How long has the program been here? For two years as well?
The computer room at the Internet Learning Center it has been for three years. For the Friends Donation room, one year, and this room is new, is just used at the moment.

// What do you see as the main challenges/problems when working with computers here in Laos?
He says that the technical problems inside the computer, the software, the program. If there is some damage to the program they cannot fix for them selves. They have to ask people from the computer shop to come here to fix it. That's the main problem.
//The software, is that in English or in Lao?
Most is in English, some is in Lao. First we have the net from the Lao people at Friends Donation. They give the program in Lao. But it's faced some problems because it's new. For computer there is no Loa exactly, we have to share with Thai. This is the first time that Lao people at Friends give us. The computers are new and the programs are new and you will face some problems.
//what kind training do you give the students here at the computer rooms and at the Internet Learning Center:
In here we train them in Microsoft Office, like Excel and Word. At the Internet center we train them in Internet access. How to save matches (search for information) and how to send e-mail.
//You have three computer rooms here at Vientiane High School. Is this the exception or is this common for high school in Vientiane? Do they all have as many computers and have such good facilities?
All the computers that we have at Vientiane High School we have only had for three years. So this is new for the high school in Vientiane. And now we have one more in Sikotabongh (?) This is the donation from Vietnam, from the Vietnamese people to have a new building like

this, a three storey building at Sikotabongh High School. They only had it for this year, it's brand new.

//The Internet Learning Center that is the foundation from Jhai isn't it?
Yes it's from Jhai. The Jhai foundation have supported us for two years. For everything; for payment, for technical service in the Internet center. Now they have finished the donation.
//How is they maintaining the computers now, how do they pay for ink, salaries, paper?
For that center they can earn money for them selves to pay for the center.

//How do they earn money?
They can earn from the students. If the students want to play computer games they pay a small fee or when they use the Internet

//How do you believe that computers and Internet can benefit Lao people?
For the Lao student or for the teacher they can get more brains, can have updated data. For example for the whole country you will have the amount of population in the world. And it will go up. For this they can update the data.
And also for the students and teachers they can get world wide

//Can you think of any ways that computers and Internet can benefit people in rural places?
For the rural school they have work shop here for the teachers from the rural areas. They come here and have work shops in computer skills. And they would like to have computers in their own school.
//But at this time it's not common to have computers in rural schools?
It would be a benefit for the rural also, but if we want that we have to train the teachers first. Teach them how to maintain and run a computer.
//What is your plans for the next year, the next three years and for the next five years? Do you have any concrete visions or plans here at the Vientiane High School?
For this year we try to find a group, to collect the students who have the skills for computers to make a group to make a website. First they will make a website for this school, for Vientiane High School. For example for teacher days or children days or something like that. After we have a website we should give installation of network to all Lao people. This year they will have a group first to make the website.
//Anything you want to add?
For the computer course and for the Internet Center. If we compare with the number of computer sets and the amount of students: 4000 students here at Vientiane High School. The computers are only a few if you compare. There are too few computers for that many students. There are about 50 computers in three rooms to service 4000 students. We face the problem that it's not average for the students.

Student interviews at Vientiane High School

1) Mr. Souksakhone (16)

1) Because I think it is very important for future. Maybe I will work with foreigners than to use computer is quite good. More good than the ones who cannot.
2) I have studied basic computer skills. To make computers.
3) Make computer, make programs,
//What kind of programs?
I don't know. Everything with computers
4) Now I don't have time, I have to study other things. I used a computer the last time in the summer.
5) To find information,
//What kind of information
Music, talk with people in other countries through chatting (MSN)
6) So so.
7) Excited
8) I would like to be a construction engineer
//Do you think you're going to use computers for that work?
Yes,
9) If we can use a computer it can be a help in our lives. It can help us to do the best. To make it work/better

2) Mr. Phanouson (16)
1) because improve everyday. We use computer to improve our life.
// in what way?
To work faster and make it better
4) About 2 times pr week.
//Do you use it down at the Internet Learning Center?
I use it in my home
//what do you use it for then?
Play games; listen to music and watch videos. Sometimes I go down to the Internet Learning Center and use Internet there
//Do you use the computer at home for school work?
Not usually. More for fun
6) To find news about sports like football.
//Anything else?
Chat with people.
7) Yes I liked it and I was exited.
8) So so. Yeah I like it.
9) Programmer
10) Better life? Through communication and for work. For many things.

3) Mr. Thanongsack (16)
1) I think it is necessary because computers can give us some information. Can exchange how people think with other people other places.
4) Almost every day but for playing games. I also use Internet.
//Do you have a computer at home?
Yes.

//Do you some times go to the Internet Learning center?
Never been there before. I have Internet at home.
//Do you sometimes use computers for school work?
No.
//What do you use the Internet for?
Research or to find information about stars, about music. Sometimes I chat (in English) I find information about something that I am interested in.
7) It was fun.
11) About 10 years old.
8) Yeah.
9) I would like to be a lawyer or something like that.
//Do you think you will use computers for that?
Maybe,
10) Maybe exchange hoe you think with other people like communication

4) Ms. Vimala(16)
1) My opinion is that it is necessary to communicate with others in other countries. To chat with others and to build relationships with people in different societies.
4) I use it every day at home. Pr day I use it 2 hours, sometimes more. Internet every day.
//what do you use the Internet for?
To chat with my aunt in foreign country, sometimes with my friends.
I often use it for home work.
11) Maybe 7 or 8 years old.
7) I liked it. I felt exited when I first used it.
8) so so. I want to learn more. To design pictures.
9) Maybe business woman or I want to have my own business. Within electricity.
12) Yes. In my own business maybe we sell products and then sometimes we need to use the computer. Marking products and keep track of the products.
10) I think they can use it in public places. I think the government should have some public computers for people to come and learn how to use the computer. It is necessary for poor people.

5) Ms. Dalounny (17)
1) Because now technology is high and we should know how to use a computer. For communication with other countries.
4) about 10 hours. Have both computer and Internet at home.
5) chatting and surfing for information. Study information.
11) About 12 years old.
7) I think that it is very interesting because we can do by hand but to use computers is better (?)
8) yes.
9) I want to work in a bank.
10) I don't know.

6) Mr. Phoutthapiloun (19) (With some help from Kongh)
1) Because then I can entertain. He wants to know about the important things around the world. News and everything that happens in the world.
4) 25 hours.
5) play games and chatting. Sometimes for school work. Likes to play games outside the school in Internet café's. Always Internet café.

11) 15 years old.
7) Liked it.
Still like it.
9) Engineer, computer engineer. Wants to go to the NUOL.
10) He says that to make us know the high technology of computers and to make it world wide. To know it inside the country and outside of the country.

7) Mr. Alournyadeth (15)
1) Because computers make us know about the world. Computers can entertain like playing games and chatting.
//Where do you use computers? (Doesn't have at home)
Internet café's.
4) 10 hours pr week.
Find information about education, science,
Sometimes for school related things.
11) 10 years old.
7) It was fun and still is.
9) Computer engineer.
10) Make people know about the world and information technology and get updated.

8) Ms. Hatsada (16) (Kongh)
1) To use in daily work such as knowing the news from Internet
//where does she use computers.
Both at home and at Internet café's.
4) 6-7 hours pr week.
// what does she use it for: Internet
11) 12 years old.
7) Happy and interested in using the computer.
8) For today its more common/normal.

9) Ms. Phoutnapha (16) (With some help from Kongh)
1) She says that know she wants to know the news. And news you can watch on TV but sometimes you want to know old news. So she wants to find old news from Internet and also the small pictures on Internet.
//where do you use computers.
Usually she uses computers in Internet café's.
//does she have a computer at home?
No.
4) About 2 hour's pr week.
5) Normally she likes to send e-mail to her friends and also search after information on the Internet.
11) 13 years old.
7) She was happy. When she switched on the computer she would like to know what would happen next. Can she do this and that?
8) She says that it has changed a little from the first time. But still exiting because she likes to know the updated news or for entertainment.
9) No she doesn't think about the future. Just try to finish high school first.

Meeting with Mr. Sompavangh (teacher) Thursday October 30th; (from my recollection, tape was lost)

He works as a teacher here at Vientiane high School. 50% as an English teacher and 50% in the computer program (all three rooms)
He has only worked here since August. Before that he thought at a college. He thinks that it is very different because there they have better equipment like air condition in the class rooms and they can give out hand outs. He uses a teaching method called TESSO (teaching English for teachers??) but he can only use parts of the methods because he needs paper and an overhead. But this is very expensive equipment.
The main problems are the technical issues. We don't know how to fix the problems.

The situation here at Vientiane High School is good compared to other high schools. This is a high ranking school and is the biggest one in Vientiane. There is a small quota for students living in the area but most of the students are accepted after taking tests.

The Internet Learning Center is open from 8.30 until 4.30 every school day (?). Now we don't get more regular support from the Jhai and we have to keep the center running. The money we charge for Internet and for playing computer games is not enough to cover the expenses. The missing part is covered by the school.

ICT can benefit the poor people in the rural areas because then they can contact us here in Vientiane if they have questions or problems and we can help them. We can serve as a resource center for other schools.

Interview with Mr. Tran Minh UNDP Laos (by e-mail) May 28th 2004

Questions:
> 1) what is your role within the United Nations?

As the ICT focal point for the UNDP Lao PDR, I'm backstopping (supporting/monitoring/evaluating/formulating) ICT for development projects of UNDP in this country. I'm also the liaison person for regional initiatives and general matters regarding ICT, coordinating with other actors and donors active in the area of ICT for development.

This is not a full-time responsibility as I have other, equally important responsibilities e.g. related to the legal sector of UNDP.

> 2) what do you see as the main benefits provided by ICT?

The main benefits of ICT are in data management and communications, broadly speaking. In Lao PDR, I think that e-Government and SME development are the main areas, i.e. making government institutions more efficient, better and more transparent offering of government services to citizens, more effective private sector, employment opportunities for the handicapped, e-Tourism, rural connectivity, etc.

> 3) what do you see as the main challenges and problems developing countries
> are facing when introducing Information and communication technologies?

Low capacity, lack of human resources. Less than half of the population knows how to read well. Language barrier, the population of Laos is very small and doesn't know foreign languages well, very little training material and online content for Lao people. The market here is very small for making investments.

> 4) what do you believe can be the solutions to these problems/challenges?

Faith and patience. We have to start now, however small, to nurture the few ICT actors/activities that will eventually grow to become more significant. There is still no doubt that Laos needs the benefit of ICT to become a developed nation and that ICT can benefit even in the current situation if applied correctly and in correct places.

Identification of key people and partnerships, existing opportunities for getting sustainable ICT for development initiatives started. Making of a national ICT strategy to have a framework for coordinated development efforts.

> 5) how do you believe that ICTs can be useful in fighting poverty?

a) Improving economy by providing more livelihoods options, especially for handicapped people, but also making private sector more competitive and efficient.

b) Empowering vulnerable/marginalized/poor groups to better take care of themselves and be better represented so that their needs are taken better care of. Bridging the information gap between rural and urban districts.

> 6) how can ICT foster social development?

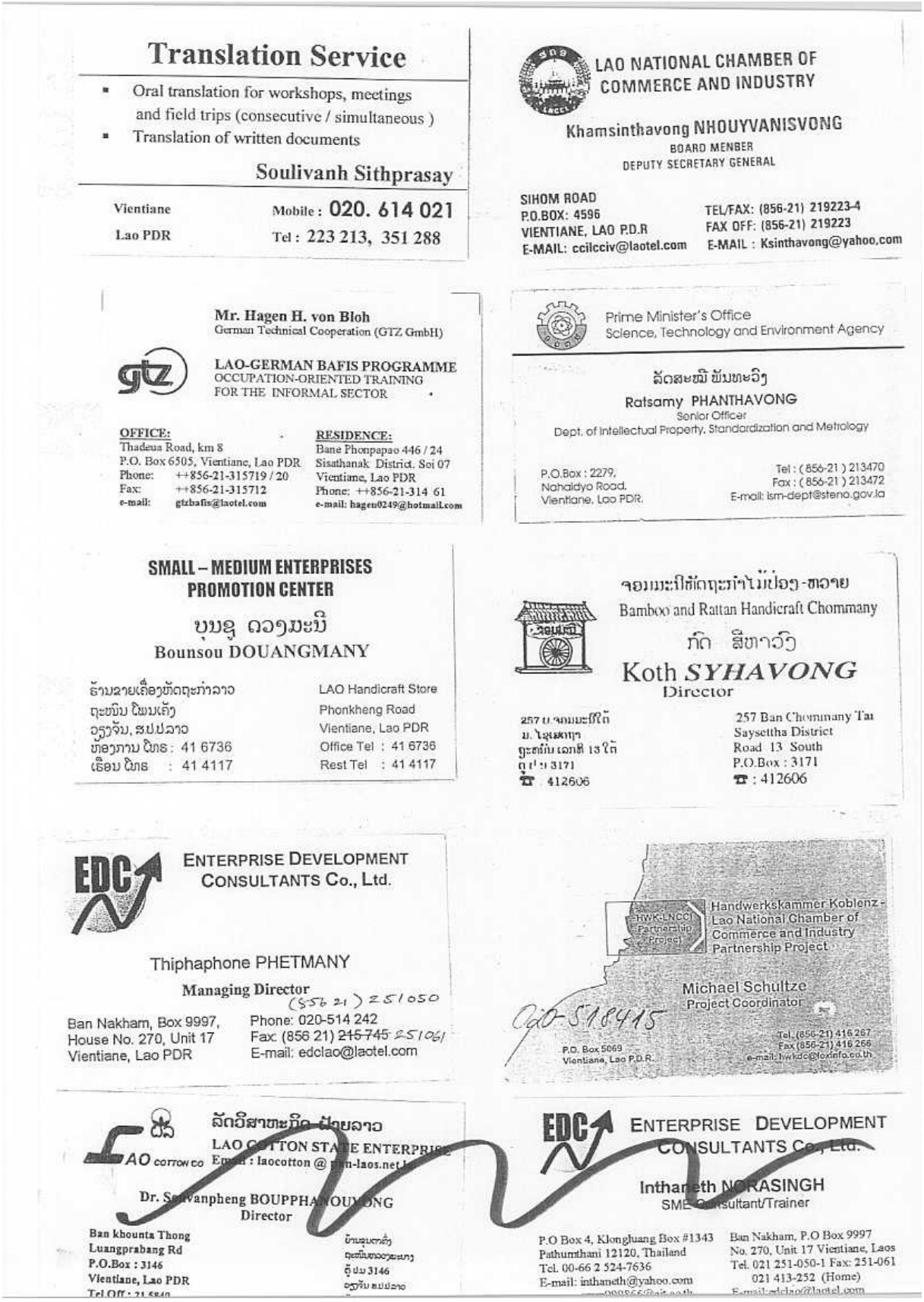
I'm not sure what you mean by social development. Socially equitable development? That is what UNDP always aims for, human development, not just economic development. Perhaps my previous answers already explains this?

Appendix B: Matrix for analyzing the results

Total "X"	Issues in the interviews	Actors					
on the issue		STEA	JHAI	NUOL	ILC Vien.	ILC Phon Mi	Bergen Kommune
	Number of interviews	2	1	3	2 t. 9 stu.	2 t 6 stu.	1
2	Lack of English skills	x		x			
2	Lao language set and content	x					
1	Lao culture		x				
1	Compatible software and standards	x					
4	Maintenance	x		x	x	x	
2	Technical problems				x	x	
2	Computer skills	x		x			
1	Brain drain	x		x			
2	IT and education	x		x			
3	Training	x	x	x			
2	Research	x		x			
2	Human capitol/resources	x		x			
3	Public awareness of ICT	x	x	x			
2	ICT awareness for high ranking officers	x	x				
1	Problems with the authorities		x				
4	Foreign aid	x	x	x			x
3	Poverty and IT	x	x	x			
1	IT to rural areas	x					
6	Economy	x	x	x	x	x	x
5	Infrastructure	x	x	x	x	x	
4	Investments	x	x	x			x
2	Income		x	x			
3	Internet benefits		x		x	x	
3	Internet negative effects	x	x	x			
5	Internet link countries	x	x	x	x	x	
3	Internet/computer prices	x	x	x			
4	Internet providers	x	x	x		x	
3	What are computers used for?			x	x	x	
3	Political decisions	x	x				x
2	Social development	x	x				
2	Economic development	x	x				
2	IT action plans	x					x
2	Least Developed Country	x					x
1	Land Locked country			x			
2	Leap frogging	x	x				
3	Legal framework	x			x	x	
1	E-governance	x					
1	Communication		x				
2	Wireless communication		x	x			
1	Local ownership		x				
	Pictures	2	x	6	20	22	0

				Vientiane High School			Phon Mi High School	
CH	Computers at home			I				
IH	Internet at home			IIII				
IC	Internet cafés			IIII			I	
IS	Internet at school							
ILC	Int. Learning center			I			IIIII	
C	Chat			IIIIIII				
	Total number of informants			9			6	
	Informants			5 boys	4 girls		3 boys	3 girls
	Average age			16.33			16.16	

Appendix C: Contact information



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The role of ICT in achieving sustainable development goals in least developed countries: A case study in Laos

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Abstract

This paper describes the challenges and benefits of introducing new information and communications technologies (ICT) to developing countries using a field case study of Laos as an example. The introductory part of the paper describes the visions and plans defined by the United Nations (UN) when it proposed ICTs as important tools for developing countries to move towards UN defined development goals. Specifically, the UN proposes that inclusion in the information society will have social and economic benefits for developing countries. The areas believed to benefit the most from ICTs are education, health, farming and government. Laos, a Land Locked and Least Developed Country was chosen for a field study to reveal the Lao peoples´ understanding of the benefits and challenges from using ICTs and to investigate the potential for achieving the UN strategic development goals through ICT development aid. Interviews were carried out with representatives from the educational sector, the government and donor organizations. The findings provide important insights to the theoretical and macro perspective provided by international organizations such as the UN, giving support to the idea that ICT can be used to foster social and economic development in a developing country.

Keywords: ICT, Development, Field Studies.

Introduction

When discussing ICT for development a dilemma arises concerning the superficiality of promoting Information Technology to developing countries. Developing countries have serious problems providing its inhabitants with food, potable drinking water and health supplies. How can computers and Internet benefit them in their situation? In examining the role of ICT in development it is clear that providing the world's population with essential necessities such as food will always be the first priority. However equal access to ICT is an important and worthwhile target which if not treated seriously by the international community will result in developing countries falling even further behind. It can be argued using a long term perspective that ICT is one of the most important means for fighting poverty. The importance of including developing countries in the information society will be discussed and exemplified in this paper, which is a summary of a major research project.

In the major research project we addressed the following questions:

i. How can ICTs be introduced to developing countries as a tool to prevent poverty?
ii. What does the "digital divide" really mean?
iii. What is proper use of information and communication technology?
iv. What are the strategies and criteria for successful development projects?
v. What do people in a developing country see as the main challenges and benefits given by information and communication technologies?
vi. How are these issues addressed by the United Nations?

We were especially interested in understanding the ICT based attitudes, goals and projects undertaken by people living in a least developed land locked country (Laos) and their perceptions of information and communication technology. We believe it is especially valuable to understand the Lao people's opinions of the challenges and benefits of ICTs to them. Their views are invaluable in the quest to gain knowledge of how ICTs can improve living conditions and reduce poverty.

It is proposed that ICTs can be viewed both as a channel for sustainable development and a goal for that development process. Such a strategy gives people new job opportunities as well as increasing the basic value of human capital within the country. This can be accomplished in the context of the superior goal being to improve development through the information technology tools made available. Taking a perspective like this, technology can be viewed as both means and ends for development.

Through this paper we hope to provide the readers with an understanding of what is viewed as important and valuable for the people in Laos, the Lao government and the international community represented by the United Nations.

Relevance

ICT for development has been a visible element in international debates. In December 2003 delegates from the whole world gathered in Geneva, Switzerland to discuss how ICT can benefit all nations. The outcome of the summit was a general declaration containing specific goals. Also, ICTs are seen as an important tool to realize the Millennium Development Goals defined by the United Nations.

It has been stated by Secretary-General of the United Nations Kofi Annan that:

> *"The new information and communications technologies are among the driving forces of globalisation. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, the gap between information 'haves' and 'have-nots' is widening, and there is a real danger that the world's poor will be excluded from the emerging knowledge-based global economy".*
> *(Annan, 2002, www.unicttaskforce.org)*

Through this paper we advocate the importance of including all people in the information society to foster social and economic development.

ICT or computers and the Internet?

Even though the paper concentrates on computers and the Internet, the term ICT is used as a generic term. This is because the international community and the UN operate with the term information and communication technology. Computers and the Internet are the most common modern ICTs and a specification has therefore not been made. Some exceptions occur depending on the context and the informants. Throughout the paper the term ICT will be used. When this implies other technologies than computers and the Internet this will be specified.

United Nations in Development Aid

The United Nations is an international organization consisting of 191 member countries (2003). Its main purposes are to:

- maintain international peace and security,
- develop friendly relations among nations,
- cooperate in solving international problems and promote respect for human rights, and
- be a centre to harmonize the actions of nations.

(http://www.un.org)

When entering the new millennium, the member countries met to set the agenda for the future. Based on previous efforts and plans, the outcome of the meeting was a set of goals for development referred to as the Millennium Development Goals (MDG).

Of special interest to this project is the eighth MDG to "develop a global partnership for development". In one of the targets it is recommended to;

> *"In cooperation with the private sector, make available the benefits of new technologies, especially information and communication technologies"*
> *(http://www.un.org)*

To indicate or measure the targets given in the MDG, a set of indicators have been added. For the 18th target in the 8th goal the indicators address the ICT situation. This includes telephone lines, cellular subscribers, personal computers and Internet users per 100 population.

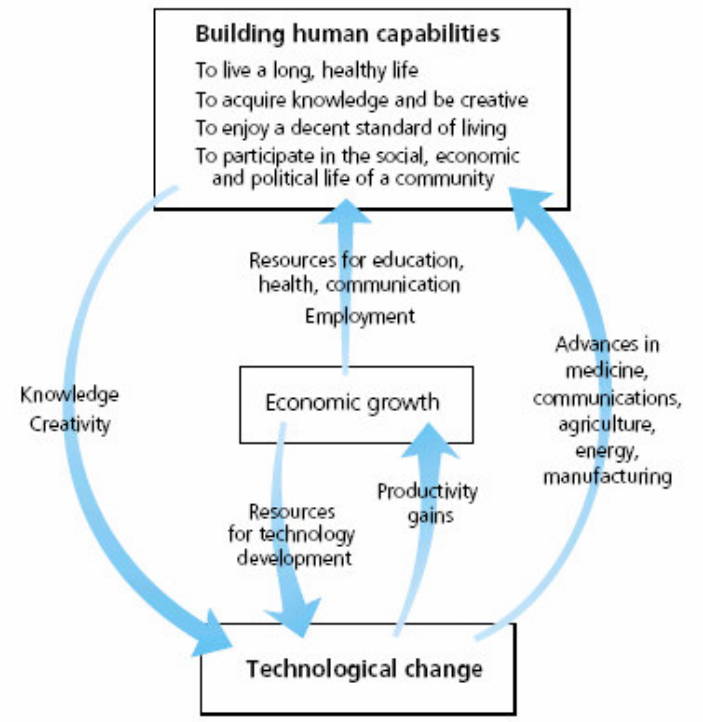
The UN operates with a list of the "Least developed countries" (LDC) in the world. In 2003 the group included 49 countries. The criteria for being characterized as a LDC are; low income, weak human resources and high economic vulnerability. Another group of countries with special needs are the "Land Locked Countries" (LLC). These are countries that do not have territorial access to coastline (OHRLLS 2003).

ICT is the abbreviation of Information and Communication Technology. There exist numerous definitions of what ICT can include. Some argue that it is limited to computers and the Internet while others wish to include more traditional and common technologies. In the widest definition ICT embraces radio, television, telephone and newspapers, walkie-talkie and handheld devices (Harris 2004). A distinction is often made between "old" and "new" ICTs.

Typical old ICTs are radio, newspapers, television and telephone. Computers and the Internet are the major new technologies.

The Human Development Report presents a model that illustrates the close relationship between building human capabilities, economy and technological change. (See fig 1)

> *"Technology is like education—it enables people to lift themselves out of poverty. Thus technology is a tool for, not just a reward of, growth and development"*
> *(UNDP 2001:27)*



Figur 1: Building human capabilities, economy and technological change (UNDP 2001)

To a growing extent ICT enters the developing aid business. Still, proof of significance is needed to see the affect it has on people's lives. It is commonly said that the discussion does not deal with whether or not to use new technologies for poverty alleviation but how to use it. Studies have shown that ICTs tend to benefit groups with plenty of resources. These are educated people that most likely live in urban centres. The really poor groups, who tend to live in rural areas, are often farmers and share a lack of formal education. Many of the poor are also illiterate. Because of their location, infrastructure such as electricity and phone lines to provide information and communication technologies are scarce leaving many of them in isolation.

If given the right circumstances, ICTs have proven capable of promoting social and economic development (Harris 2004). This has been evident within health care, education, employment, agriculture, and trade, and also of enriching local culture. According to Kenny, "ICTs bridge the distance between remote communities and service providers – markets, government departments and aid agencies" (Kenny 2001).

The digital divide is a term often used to describe the gap between the ones with and without access and between the "haves" and "haves not". To measure the digital divide, Lallana has defined three indicators. Together the indicators signal the population's access to ICT. The main indicators are:

> *"telephone density (teledensity),*
> *personal computer penetration and deployment and*
> *the number of Internet users" (Lallana and Uy 2003).*

When discussing issues concerning ICT and development the term, "leapfrogging", must be included. It "implies a quantum leap from the traditional stages and cycles of progress to the information society" (www.apdip.net). While doing so developing countries can possibly catch up with several centuries of development in a few decades. Information and communication technologies can make this possible through use of modern technology.

The flexibility of the information society allows the overall system to link up and include everything that is seen as useful and valuable. This gives the possibility to devalue and exclude things that conflict with the dominant values and interests. The new global economy constituted in the information age is characterized by this simultaneous capacity to include or exclude people, territories and activities (Castells and UNRISD 1999). Within today's society, information and communication technology is an important tool that conditions power, knowledge and creativity. Further it is argued that ICT has two roles in stimulating development. First, it allows nations to leapfrog several stages of economic growth in terms of modernization and increased competitiveness. Second, ICT has the ability to strengthen exclusion for countries that are unable to adapt to the new technological systems (Castells and UNRISD 1999; EO and UNDP 2001).

> *"Uneven access to ICT tools and networks – within countries and between countries – both reflects and threatens to exacerbate, existing inequalities" (EO and UNDP 2001).*

In every corner of the world, both within developing countries and developed countries, there are groups of people that do not take part in the information society. They can be characterized as belonging to the fourth world. The main characteristics of these people are that they have "lost their value for the dominant interests in information capitalism" (Castells and UNRISD 1999). Reasons for this might be related to economy, education, health, social issues, awareness, access, knowledge and interest.

To prevent this from occurring attention should be given to the fields that are most likely to benefit from ICT. The main fields are education, health, farming and government.

Education

Within education ICT can be used in several different ways. ICTs can function as tools supplying traditional education, to being the main medium for online and distance education. According to Kenny, radio is the most widely used electronic media in distance learning programs in developing countries. This is mainly due to the cost effectiveness of it. Adkins (1999) has studied seven educational interventions and discussed the cost effectiveness related to them. The results were in terms of incremental improvement that spending 1 USD on radio

instruction gave 70% higher impact than 1 USD spent on textbooks and 11 times higher impact than 1 USD spent on teacher training (C. Kenny 2001).

Health

The health sector is a promising area to apply ICT because of the role information and knowledge has. In health based aid, ICTs offer one possible approach for meeting the challenge of providing training for healthcare providers. The availability of modern ICTs gives new opportunities for training as well as being a source of information.

Farming

Access to information of new technologies and research within the field is useful for farmers. Communication for this group is useful because the farmers can communicate and develop a social network. In India a group of farmers started coordinating the seeding and harvesting through a network of telecentres. Because of this they could provide a steady supply to the markets. This resulted in a more stable market for the farmers (Harris 2004).

Government

Common among developing countries is ineffective and bureaucratic public administration. ICT can be a helpful tool in improving efficiency as well as making societies more transparent. Within administrative and governmental work ICTs can benefit in different ways. First it is helpful for the citizens to gain easy access to rules, laws and different application forMs Obtaining different forms and land regulations can be a troublesome process for people living in rural places. A second benefit is that it might contribute to a more transparent society. Providing information on the Internet might prevent delays and discrimination because of direct access to the needed information.

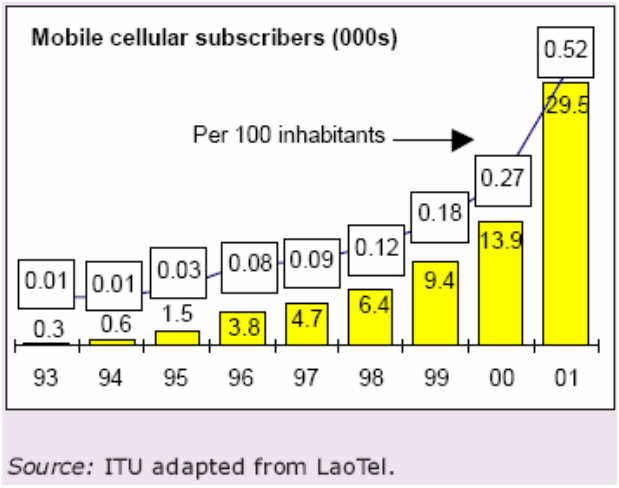
Project´s own field study

When searching for a country suitable for field study there were several criteria regarded as important. The first and main criterion was that the country needed to be a Least Developing Country. This group is addressed specially in the Millennium Development Goals and face special development challenges. Furthermore, it was desirable that the country was a Land Locked Country. Countries that meet these two criteria tend to be the poorest in the world and might face special challenges, including ICT challenges, because of their location and economic situation.

Laos is one of the least developed countries in South East Asia also when it comes to the ICT indicators in the MDG. In addition, the fact that the country is ruled by a one-party regime is likely to add an extra challenge to introducing information and communication technology.

ICT in Laos

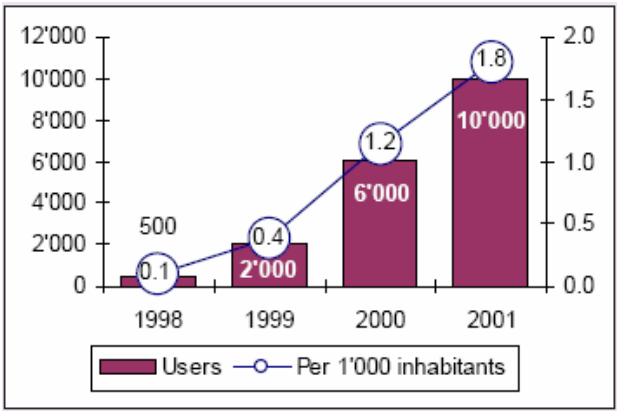
Lao PDR has not experienced the wireless boom to the same extent as other developing countries. Compared to its neighbouring country Cambodia, which has about the same per capita income and was introduced to wireless technology the same time, there are visible differences. In 2002, Cambodia had twice the mobile penetration of Laos. In 2002 only the urban areas in the 8 (out of 16) provinces are covered by mobile cellular coverage (Gray 2002).



Figur 2: Mobile cellular subscribers in Lao PDR pr 100 inhabitants (Gray 2002)

The international telecommunication Union presents several possible explanations. Laos was the last country in the region to open up for competition in the mobile sector and did not introduce pre paid phone cards until year 2000. Other explanation relate to the countries economy and geographic situation for hampering the growth.

Laos was one of the last South East Asian nations to adopt the Internet partly due to scepticism from the government related to the potential destabilizing influence the Internet might have. Taken together with the suspicious attitude, the country faces great barriers in Internet access and use (Gray 2002).



Figur 3: Internet users in Lao PDR pr 1000 inhabitants (Gray 2002)

The International Telecommunication Union (ITU) sees the main barriers for Internet use in Laos to be:

- Lack of overall Master ICT plan
- Low income
- Poor rates of illiteracy and educational attainment
- Lack of infrastructure
- Shortage of Lao content

(Gray 2002)

Organisations who participated in and supported the field trip

The Science Technology and Environment Agency (STEA) is a governmental agency placed under the Prime Minister's Office in Laos. They are responsible for drafting the national e-strategy and e-policy plans. The people interviewed there were Ms Sisavanh and Mr Keonahkone.

The Jhai Foundation is an American-Lao donor organization. The projects they carry out aim at improving social and economic development in Laos. The main area of work is within wiring the country to the Internet. Through the Internet Learning Centres and the Remote IT village project, access and training is provided to students as well as the other villagers. Two high schools were visited as part of the field study. Interviews were carried out with the country coordinator, Mr Vorasone as well as 4 teachers and 15 students. Besides being involved in introducing ICT to Laos, the Jhai Foundation has projects within health care, building infrastructure and coffee production.

At the National University of Laos (NUOL), students can enroll in a bachelor study program combining computer science and mathematics. At the faculty of science there is one computer lab with 20 computers connected to the Internet. These are used for the computer classes. The IT centre is a new establishment and was scheduled to open late fall 2003. It will serve as a training centre for staff as well as students at the University. Three people were interviewed at the NUOL.

Picture 1: Computer class at the NUOL

Summary of Findings: Challenges associated with the introduction of ICT in Laos.

The results from the field study showed that the informants have different perceptions of what the main challenges of ICT are. Awareness was discussed by the STEA, NUOL and the Jhai Foundation;

> *"First the challenge is the competency of on the one side what the Lao society is facing with the knowledge of ICT in terms of awareness. Not many people understand the how ICT benefit to the society." (Mr Keonahkone, STEA)*
>
> *"… because people don't know what ICT is, in correct way, we need to educate them about what ICT is" (Mr Phonekeo, NUOL)*
>
> *"The main challenges are to make the decision makers, the high ranking officers to understand why. Because those people are the people who have more power" (Mr Vorasone, Jhai)*

Others implied that the challenges are directly related to technical aspects of computers and Internet connection;

> *"Problems they have when working with computers are hanging computers, difficult to control the mouse and Internet connection is not good" (Mr Keochay at Phon Mi High school, with interpreter).*
>
> *"He says that the technical problems inside the computer, the software, the program. If there is some damage to the program they can not fix for them selves. They have to ask people from the computer shop to come here to fix it" (Mr Saming, Vientiane High School, with interpreter).*

The challenges the Lao informants face when introducing and working with ICT can be summed up in the following point list;

i. awareness
ii. human resources
iii. lack of foreign language
iv. technical skills
v. infrastructure
vi. economy
vii. ICT laws, regulations and policies

Conclusion

In Laos there are positive attitudes towards the role ICT can play in the country's development. Spanning from high schools to the government there is a general comprehension that computers and Internet will give the Lao inhabitants an increased number of work opportunities as well as means for sharing information, communication and entertainment.

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Appendix E
Presentation at conferences

The role of ICT in achieving sustainable development goals in a least developed country

A Laos case study

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Overview of presentation

- The UN's focus
- Application areas
- Laos – country profile
- The Lao people's perception of ICT
- ITUs view

The UN

"In cooperation with the private sector, make available the benefits of new technologies, especially information and communication technologies" (Target 18, 8th MDG)

- Indicators of the digital divide:
  - telephone density,
  - personal computer penetration and deployment, and
  - the number of Internet users

"IT is a powerful tool with diverse applications. Our challenge is to put that power at the service of all humankind." Kofi Annan

Application of ICT

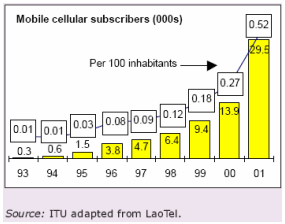
- Sectors that may benefit from ICT:
  - Education
  - Health
  - Farming
  - Government and adminstration

Laos

- Least Developed Country
- Land Locked Country
- Low human development
- Literacy level: 52.8%

Telecommunication in Laos

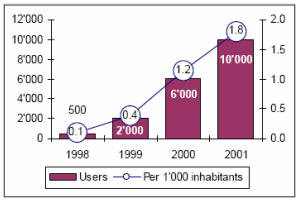
- Less than 1 percent of Laotian households have a telephone
- Voice over Internet protocol
- Pre paid service launched in 2000



Source: ITU adapted from LaoTel.

Computers and Internet in Laos

- 1.8 computers per 1000 inhabitants,
  1.8 Internet users pr 10 000
- Laos was late to adopt the Internet (1998/2002)
- About 60 internet cafés



Participating organisations in Laos

- STEA: The Science, Technology and Environment Agency
  Governmental agency responsible for e-policy and e-strategy
- The Jhai Foundation:
  Lao-American donor org.
  - Internet Learning Centres
  - Remote IT Village project
- The National University of Laos:
  Offers study program in computer science and mathematics.

Internet is used for:

- Communication
- Pleasure
- Play games
- Search for information, old and new
- Share culture
- Link countries

Challenges 1/2

- Awareness

  "… because people don't know what ICT is, in correct way, we need to educate them about what ICT is"
- Human resources
- Lack of foreign language

Challenges 2/2

- Technical skills
- Infrastructure
- Economy
- ICT laws, regulations and policies

Main barriers for Internet use

- The International Telecommunication Union:
  - Lack of overall Master ICT plan
  - Low income
  - Poor rates of illiteracy and educational attainment
  - Lack of infrastructure
  - Shortage of Lao content

Summary

- The UN sees ICT as an important tool in development
- Laos was chosen for field study
- Interviews were carried out with:
  - the government,
  - the educational sector and
  - a donor aid organisation
- Despite the challenges they face there are positive attitudes connected to use of ICT

Conclusion

- ICTs can give the Lao inhabitants an increased number of work opportunities as well as means for sharing information, communication and entertainment.
- The challenges the Lao informants face working with ICT can be summed up in the following point list;
  - awareness
  - human resources
  - lack of foreign language
  - technical skills
  - infrastructure
  - economy
  - ICT laws, regulations and policies

Thank you for your attention!

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