

PART FIVE

Analyses, Conclusions, and Recommendations

CHAPTER 12

Analyses, Conclusions and Recommendations

This chapter will analyze and discuss the research findings with an effort to reflect the knowledge creation and Public Communication of Science and Technology processes as well as the issues of Knowledge-Based Society and Sustainable Development resulted from the synergy between Local Wisdom and Modern Science and Technology.

Another way to categorize all those case studies in the previous Part Four can be on their processes, starting from the origin of knowledge creation process in which the initiators recognize their own problems. Then, a need for change together with their value system steers them on the knowledge path towards knowledge frontline to seek for the answers and solutions. Consequently, the process can be considered from the basis of each **initiator** of the case study who feels the need for change and take an initiative in the development process with confidence and strong will to succeed regardless of the long journey of trial and error or being judged as different from the mainstream. In this trajectory we can put initiators into three groups:

- **Rural community (or Grassroots) initiatives**
- **Academic initiatives, and**
- **Business initiatives,**

Accordingly, in order to analyze the process of knowledge creation, case studies are re-classified into three groups according to the “initiative – initiator” of their tasks, namely, rural communities initiatives, academic and business ones.

Rural Village initiatives, initiators are villagers who face with local problems. They live and share happiness and sufferings with their fellow villagers. The initiators in these categories vary in degree of their prior knowledge of the issues at hands. It affects how they take journey to discover both themselves and new input of knowledge whether coming from LW or MST to achieve their goal in finding solutions to meet their local problems and conditions. This perspective ranges from initiators who know almost nothing about coping with the problems they are facing, to the ones who are more adept. However, what they have in common is strong will and confidence; and are determined that change is necessary and they must take action. There are five case studies fall into this category: Rice Varieties Improvement, Herbal Uses for Integrated Farming, Soil Replenishing: From Sky to Earth Project, Indigo Dyed Textile of Mae Theeta, and *Kanom Jeen* Noodle Dough: A Community Micro Enterprise.

Academic initiatives, the initiators are highly educated persons. However, what makes it special is their extraordinary ways to consider LW along with their expertise rooted in modern science and technology. Their works take the whole nation to better understand and appreciate LW. LW is, then, made available and compatible to modern life while keeping its traditional values and dignity. Interestingly, their work is originally based on the appreciation of the heritage and cultural values of LW as much as the confidence in the validity and efficacy of LW as seen in both cases of Traditional medicine.

Business initiatives, the initiators come from business sector. However, their initial interest is not from being rich, but rather to work on something they love. Since they know about market possibilities and marketing and importantly of technical assistance to solve the problems in production process, they have created new possibilities of using LW to meet local and export market demands. There are two case studies in this category: Rice Creative Products and From a Weed to Innovative Furniture.

Framework for the Analysis:

Within this Part Five, there will be three-fold of the analysis:

Firstly, it will apply the SECI Model of Knowledge Creation and the concept of *Ba*, as the framework in identifying the process of knowledge creation in the above context (of each origin). This effort aims at

formulating or making explicit of the synergizing of LW (as *social engine*) and MST (as a complementary and catalyst) for the Co-intelligence of LW and Modern Science and Technology in the rural community context. It will try to identify the roles and mechanisms of LW and MST in this new perspective keeping in mind the goal to enable Thai society to be a Knowledge-Based Society or a Knowledge Society – one that moves in the development and globalization process with knowledge and dignity using Local Wisdom as a *social engine* to enrich itself with other available knowledge sources and systems.

Nonaka and Takeuchi (1995) state that Knowledge Creation is a spiraling process occurring through continuous and dynamic interactions that convert between tacit and explicit knowledge. It can occur at various levels – individual, groups, organizational and inter-organizational. Knowledge Creation undergoes a social process of conversion by passing through the four phases of the SECI Model, namely, Socialization, Externalization, Combination and Internalization.

Within this analysis, the main focus will be aimed at the level of interactions between villagers and the other parties who are from outside the community and utilize modern knowledge of science and technology in the rural community development activities that villagers are involved in.

Secondly, as the synergizing of these two different knowledge systems provides a new, adapted knowledge, it is considered as a transformation process. A closer investigation focusing on communication between two knowledge systems will be identified to offer a better understanding of this transformation process. This will open a new perspective for Public Communication of Science and Technology (PCST) to perform more efficiently for a new and larger audience of villagers in the developing world where Indigenous Knowledge (IK) or Local Wisdom (LW) plays a long established role in rural communities of Thailand.

And lastly, it will seek to reflect the issues of “knowledge-based society” toward “sustainable development” as resulted from this transformation process. It will also offer a model for this synergy and recommendations for the rural community development for Thailand within the perspective of mutual enriching between Local Wisdom and Modern Science and Technology towards a Knowledge Society and Sustainable Development in the globalization era.

Rural Village Initiative/Initiators: There are five case studies in this categorization, namely,

1. Rice Varieties Improvement
2. Herbal Uses and Integrated Farming
3. Soil Replenishing: From Sky to Earth Project
4. Indigo Dyed Textile of Mae Theeta
5. “*Kanom Jeen*” Noodle Dough Factory: Community Micro Enterprise

Case Studies	<i>Ba</i> : main context of interaction (of LW & MST)	S Socialization Tacit-Tacit	E Externalization Tacit-Explicit	C Combination Explicit-Explicit	I Internalization Explicit-Tacit
1. Rice Varieties Improvement	Family, community	A young man living in a farmers’ family seeing and sharing the problem of cost-ineffective rice farming.	He persuaded a few friends in the village to seek for local knowledge from old wise men as well as modern knowledge to solve the identified problems/ initial question also led to unexpected, but importance questions	All knowledge gathered was systemized through their own field experimentations/ land plots were divided for comparing experiments – the conventional way, and the new method	Learning by doing: bodily experience and the new knowledge resulting from their experiments were internalized/ new and useful knowledge was ready for further use, sharing and enrichment with others.
2. Herbal Uses and Integrated Farming	Family, community	A local healer of herbal medicine began to aware of how chemical uses on his plants can be harmful to his patients and his family. He wanted to extend his knowledge in herbal uses to his agricultural practices.	He persuaded his family to change to a non-chemical integrated farming. He seeks modern knowledge of organic farming and knowledge from an agricultural scientist to produce herbal fertilizers, hormonal solutions and insect repellents	He combined his knowledge of herbal plants with modern knowledge in organic farming including techniques in producing various formulas for totally chemical-free fertilizers, hormonal solutions and insect-repellents.	He applied the combined knowledge in his farm works. Experiences from the new practice made him and his family members confident in this new livelihood and raising awareness in the importance of non-chemical farming and relevance of herbal uses. They go on with sharing the knowledge and promoting this perspective.

3. Soil replenishing: From Sky to Earth Project	Family, community	Born in the village, a well-respected and active farmer shares the hardship with his villager fellows faced with the unproductive land in the area/ his childhood memory that the village used to be abundant and people were happily living among nature motivated him to make a difference in his village	Discussion brought shared visions of the problems and the will to change for the better/ making problems explicit allowed more people to see into their own problems and willing to join the activity (100 participants)/ their technical requests to outside organizations were granted with a soil-scientist consultant and financial aid to the project.	Both villagers and the scientist learned from each other through working closely together on the actual sites in the community. Knowledge they learned from the initiator and the researcher was applied to each one's land plot and different condition up to their improvisation, resulting in 100 methods for soil replenishing	Villagers experimented their own methods to improve the soil. The success changed the mindset of villagers and outsiders that Northeastern soil is infertile. It brought large public and media interest.
4. Indigo Dyed Textile of Mae Theeta	Family, community	Mae Theeta wanted to revive indigo dyed textile production for family income, despite of very little experience.	She and her daughter sought the knowledge from old people in and out of their province. An opportunity to work closely with a scientist in this matter helped them to acquire more scientific knowledge in the process of dyeing.	The ancient art was combined with the knowledge from S&T in the dyeing process. Research findings helped them to better the dyeing process and able to produce high quality textile to serve the cultural and economic needs of the community.	New, adapted knowledge allowed them to better their work in both quality and quantity. Knowledge was enriched and shared among other villages within the province and also other provinces in order to promote high quality and genuine indigo dyed textile.
5. "Kanom Jeen" Noodle Dough: Community Micro-enterprise	Family, Communities	Community-initiated regional meeting among local community leaders of the South helped them to recognize their indebtedness which closer to a level of both family and community bankruptcy in southern area. They felt an	A project in one village community was initiated to help everyone in the community/ local working group set a task force aimed at self-reliance and well-being of the community starting from local needs and available resources/noodle dough as community business was	Community shares were used as business fund to build the first factory to produce noodle dough that people could buy from them to make local traditional noodle. All workers were from the community. Knowledge in all aspects of production and	Based on the knowledge they acquired and practiced, they learned from both success and failure, keeping in mind the community's common goal to be self-reliance, rather than making optimal profit. Success brought more confidence and dignity. Now they share the

		urgent need and shared goal for change, not waiting for the government to come and to ease their problems	identified to use local rice from the region as raw material.	management were sought from various sources and was combined into their operation.	knowledge without “commercial secret” mentality. They also extend the production into more innovative products.
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Analysis Within the Framework of the SECI Model of Knowledge Creation

Within the trajectory that local communities take the initiatives in development both for their own occupations (as in the cases of Rice Variety Improvement, Herbal Uses for Integrated Farming, and Indigo Dyed Textile of Mae Theeta) and for community development (as in the cases of Soil Replenishing and *Kanom Jeen* Noodle Dough Factory: Community Micro-enterprise). They shared the same starting point. It began from within an individual’s and community’s self-awakening and self-recognition that led to a shared goal for change. The process of recognizing and defining problems by individuals themselves and common goal of the community members opened possibility for higher step of knowledge creation. Panich (2004) makes an analogy of this dynamism as a “blast from within”. Its impact is powerful as a “Big Bang” that will lead the whole series of action after recognizing the problem and making it explicit. It also strengthens the will and confidence in overcoming any obstacle¹ till the solution is achieved. Thus, it is this energy that moves individuals and communities.

It could be considered as the starting point of the SECI Knowledge Conversion process that occurs at intra-personal or intra-rural community level to recognize their tacit knowledge of the situation before they could move to include more people and more knowledge. In this initial step, the initiators usually began from their community capital or resources. Hence, they looked for knowledge from “wise men” or experienced older people who knew more in the village and from other villages. Since they were people who shared the same suffering of being poor, together with the fact that sharing and giving are common practices in village life, socialization reinforced their relationship or even helped them to reestablish relationship or link between the older and younger generations. It is the inclusive way to engage everybody in the process of knowledge

¹ “To work is, in itself, to practice Dhamma.” Buddhadasa Bhikku. See Chapter 3 and 5.

creation. It promotes the reestablishment of the value systems within traditional knowledge and of the “knowers”. It is the process of going “back to the roots” as Phongphit (2003) calls it.

In the spiral of knowledge conversion, the socialization process in the context of rural community initiatives began when the initiators raised the questioned inwardly, or the group reflected among them the problems or situations and felt shared need for a change. This could be interpreted as a reflection from religious values in Buddhism that a person is responsible for himself to find the root-cause of the problem and to find the way to solve the problem (*the Four Noble Truth*, and *the Noble Eightfold Path*. see Chapter 3.). Being analytical and critical in order to use one’s intelligence and wisdom to solve the problem is central to a person’s life (*yonisomanasikarn*). In addition, it also places value on finding support from friends (*kalayanamitara*) and providing or extending oneself to help others when one can.

These religious and social values provide self-confidence about the ability to integrate one’s prior knowledge with new knowledge to be found on the knowledge path towards solution to the problem. The path is open and welcomes other knowledge and people. And it is important that one has to start the journey to enrich oneself. To be active and assertive in one’s destiny is the key issue. The inward looking provides an analytical and critical reasoning why one needs to make a difference to life or to the community and how one can achieve the goal. This initial determination is in itself much more important than prior knowledge or know-how that one has. It has a driving force for the pursuit of knowledge.

A traditional Northeastern saying also states that “A step out of the house, one finds many things, a little moving up higher, one sees much farther”. (CODI, 2003) This reflects the attitude of traditional rural life toward searching of knowledge and making use of it. Even from another region, the case of noodle dough factory in the south, the initiator and his team travel extensively before the establishment of the factory and continue to do so when it needs new enrichment to their business practice, for example, when new products is to be created, and when the factory needs to use cleaner technology.

In this initial step, not every community has this kind of innovative initiators or natural leaders. In rural community context, NGOs play an important role as a catalyst and facilitator for change by offering new vision and strategy for them to recognize their own problems. It has to move away from the mainstream development mentality that the

outsiders point out the problems for them and offer solutions. An alternative approach to work with rural communities and let them identify their own problems and feel the need for change is called “*pracha pijai*, literally means research by common citizen. This is simply a set of questions asking villagers to examine their daily, weekly, monthly, yearly expenses, income, and their lifestyle. It is to make them recognize their own problems by themselves. Usually, in the process of working together, a natural leader emerges. NGOs are only facilitators to provide consultant or mentoring.

Daycha Siriphat (2004) of Khaow Kwan Foundation emphasizes that villagers need to de-learning the modern development mentality and practices. He states that changing the paradigm of thinking is the most important for them to shift (back) to sustainable agriculture practice in order to override their poverty. “Techniques in making organic fertilizers, insect-repellant from herbs, using micro-organisms and improving rice strains are easy to teach, it doesn’t take much time to learn. But the most difficult task is in motivating and guiding them to have self-awakening and to feel their inner motivation for change.”

The self-awakening and self-recognition within the initiators at these intra-individual and intra-community levels is crucial for knowledge expedition. It provides internal energy that is governed by traditional values. Knowledge is not **the** aim, but the way to obtain and to use that knowledge is as much important. Thai traditional knowledge of any area does not only stress importance of knowledge at the aspect of its “truth”, its worldview and social values are indispensable innate components. As a result, it is knowledge of harmonizing and co-existing of all things on earth. That is the reason why Thai people prefer to call its local knowledge as “Local Wisdom”.

Socialization: From Tacit Knowledge to Tacit Knowledge

The SECI Model of Knowledge Creation is originated in the business context where socialization process more or less engages workers to act toward the shared goal the company has set for them. On the other hand contemporary rural communities in Thailand were disintegrated caused by capitalism that promoted competition rather than collaboration. From the case studies it is found that the initiators have to get out of the mainstream and find a few friends or people who share the same perspective. When an initiator is a person of no importance, there would be only few people who want to join the mission in the beginning. For

example, in the case of Rice Variety Improvement, Sinchai, had only a few friends in setting off to find solution to the problem. Despite the fact that the problems he saw (the uses of chemicals, high cost, high health risk, and dependency on commercial variety) were common problems in rice farming per se. The condition was the same in the case of Indigo Dyed Textile of Mae Theeta. The initiator had to prove first the success before others to follow. However, media coverage and other social recognition will also build credibility and call attention among other villagers to join them later. On the other hand, in the cases that the initiators are famous and respectable their activities received large attention from the communities such as in the case of Soil Replenishing: From Sky to Earth Project, Herbal Uses for Integrated Farming, and “*Kanom Jeen*” Noodle Dough Factory.

It is important to consider the role and characteristics of the initiator in activating the socialization process. These people are natural leaders with no official authority. They are judged by other villagers based on their integrity and competence in the livelihood as well as their ability to lead the community to perform certain task. The compassionate characteristic of the initiators/local intellectuals as natural leaders is crucial to make other participants or members feel at ease and welcome as people who share the same suffering. Natural local leaders are more effective than the representative formal leaders in involving other community members in assuming responsibility for the benefit of the community.

According to Nonaka, the knowledge spiral moves continuously. Another important moment is when the socialization comes to the point that rural villagers have a chance to meet and work with scientists or development practitioners who often utilize modern knowledge of science and technology in rural development, such as agricultural development and other income generating projects. This is the second point to mark the socialization mode and the whole process of knowledge conversion to continue successfully upon integrating and transforming Local Wisdom (LW) and Modern Science and Technology (MST).

Many time modern development workers try to introduce useful development project into a rural community with good intention to help poor people. Unfortunately, they do not understand the context of rural community because they do not have enough opportunity or intention to share space and time to have empathy with local community. Cruba Sutthinan says that if a development agent, be it an academic, a researcher, a scientist, or a development worker, “*ruam took, ruam sook*”

or live the moments to share and empathize both suffering and happiness together with villagers, it will ensure the success of the development project. This way villagers and development agents are able to look in the same perspective of development that is development in which local issues, real problem and condition of the community and its people are reflected.

It is necessary to create this *originating ba*, a space and time where villagers could empathize and unify their goal with outsiders' by learning about each other through direct experience within the context they have to work together. This mode is a preparation or a foundation for anyone involved in the project to be ready to work together.

Externalization: From Tacit Knowledge to Explicit Knowledge

At this mode, *dialoguing ba*, is the ground for the externalization of tacit knowledge in order to make it explicit. People involved engage in listening what the others have to say, as well as reflect on their own opinion and knowledge. It is the condition to welcome and match with something new or not familiar to them. It is the condition to reveal and to create something. From each case study at this externalization process, rarely problems or dispute occurred between villagers and scientists or development government officials. If there was any, the traditional value to keep harmony and the wisdom to get the problem solved would keep it under control as seen in the following cases:

Rice Varieties Improvement: In the beginning Sinchai and his friends sought for advice from local agricultural development officer, but the answer was unsatisfactory. They were told that the problem could not be resolved because "it was the way thing was done". However, they never lost heart. They continued the search until they met with Daycha to ask for his expertise in the matter of rice. He acknowledged their needs and provided them with technical advice. Daycha and Sinchai were able to engage in dialogue because they listened to each other and can share empathy. Their dialogue even convinced Sinchai and his friends the importance of what they were trying to do.

Herbal Uses and Integrated Farming: Mor Gu sought out advice from an agricultural scientist for his advice on how to produce organic fertilizers, insect repellants, plant hormone solutions including solution to kill fungus. The scientist provided him advice of basic techniques and took time to visit his farm and was amazed at the magnitude of his activities in

herbal uses for integrated farming which is far more than a simple use of conventional plant spray to repel or to kill insect. He created his own formulas which are complex and used a large number of herbs in his own land. This scientist, though he was not acquainted with Mor Gu, he was able to understand him. It was because his main work was involved with the Royal Project for Development, based on the philosophy of “self-sufficiency economy”, which was the same value Mor Gu hold. So, they understood each other easily.

Soil Replenishing: From Sky to Earth Project: Cruba Sutthinan is a well-known local community leader and was awarded as a Thai Wisdom Teacher by the Office of the Educational Council. He is experienced in working with outsiders. His gentle, humble, yet full of humor personality makes it easy for him to work with others. In this case it was very interesting to see the scientist; Dr. Sawang from Khon Khaen University who was the consultant to the project changed his attitude after socializing and having dialogue with villagers. He stated that he used to believe in the knowledge he studied in the university and never considered the other way until he worked in this project. His statement showed the importance of opening up one’s mind, especially one who is from higher social status, in working with villager in order to nurture mutual learning.

Indigo Dyed Textile of Mae Theeta: In this case, the scientist researcher was initially appreciated the art of indigo dyed textile, and made frequent visits to Jiew and Mae Theeta’s place. The project allowed them to work more closely as Mae Theeta’s group was selected for the research findings implementation site to promote community economy. The dialogue was always on since Jiew was also the research assistant to the project. The community’s problems and concerns were constantly communicated directly from Jiew and other participants to the scientist and vice versa. In this case, National Science and Technology Development Agency (NSTDA) acted as a facilitator and funding agent. The responsible unit of NSTDA understood rural context quite well that it recognized the importance of supporting and providing spaces and time for interaction among villagers and scientist researcher, not only conducting research in the laboratory.

“Kanom Jeen” Noodle Dough Factory: Community Micro Enterprise: Viroj always encounters many scientists or officials in scientific-related fields to his business. He and his team, though were open to others’ opinion, used their own set of values to guide the interaction between them and the authority. As it was seen in the incident when he consulted

with a local official about sewage treatment of the factory, and the official provided him the system that treated water would flow into the river. It was obvious that the official had the attitude of “simply doing my job”, while villagers were more concerned to their relationship with nature, and other people living in the same environment. In general, their work with other scientists had no problems in the dialogue process.

The initiators act as the leaders and play an important role in encouraging others in the groups to open up their mind and express their opinion and even extending it to rather passive villagers. For example, in the case of Soil Replenishing, Cruba Sutthinan did not blame people who did not participate, but welcome them in the meetings. He persuaded other members to go to the passive villagers to plant some vegetables and trees for them to let them slowly appreciate the benefit of plants and trees.

Up to this point, the importance of the roles and characteristics of the initiators could be reconfirmed. Without their strong will and commitment for change based on traditional and religious values, it would be impossible to lead themselves and other team members into the next modes of the Knowledge Conversion process.

Combination: From Explicit Knowledge to Explicit Knowledge

Takeuchi and Nonaka (2004) see that combination is a process of systematization. It involves combining different bodies of explicit knowledge. The combination of the explicit knowledge of the villagers’ with the explicit knowledge of the experts’ occurs in the *systematizing ba*. Though they focus on business organization context and on the use of Information and Communication Technologies (ICT), some adaptation could be used to apply to the rural development context.

In the context of rural community, new knowledge can occur only after villagers have opportunity to engage in meeting, conversation and discussion between them and scientist researchers. This interaction leads to new, adapted knowledge or alternative methods to solve the problems. This incident occurred in every case of rural initiatives.

Conclusively, in the combination mode and in the rural context – close encountering of villagers and the scientist through meeting substituted all the popular ICT. ICT still play a low profile role in this context. Though, the government has created many ICT program for rural community uses,

the utilization is still low because lacking of local staff to help promote the use to meet real local needs and necessities.

Internalization: From Explicit Knowledge to Tacit Knowledge

At this mode, *exercising ba* will occur. It is the process that operational knowledge such as know-how is practiced, or the action is taken place. Actually, the action they took by themselves in those activities allowed close observation to each step of applying the combined knowledge to see if it worked or not. For example in the case of Rice Varieties Improvement, Sinchai and his friends acquired new technique of germinating rice grain without husk from a short training with Daycha in Suphanburi. They came back to their village and applied the technique with the rice strains they wanted to grow. They ran a field experiment using their senses and observation to reach the conclusion of the experiment.

In the context of rural initiative, the two modes of Combination and Internalization occurred almost simultaneously as the actions were taken in order to experiment the new knowledge synthesized from the integration of LW and MST, to see whether and how integration would work. After the results of experiment of such knowledge came out, people in the group gathered, shared and discussed of their own experiments and experience. The results, then, were transformed into manuals, texts and other media to enable the next round of knowledge spiral and to share this new, adapted knowledge with others later on.

Academic Initiative/Initiators: Probably, academic (or governmental) initiator may represent the largest number of rural development projects. In the past, more projects failed than succeeded and with low rate of sustainability. These two case studies touch on one of the most highly public interest areas, traditional medicine. It will be useful to analyze the process of knowledge creation and look at the sustainability in all aspects of the projects to understand what contribute to the success, or stagnation, if there are any.

6. Folk/Traditional Medicine and Local Healers of Lanna (Northern Thailand)

7. Alternative Medicine and Herbal Product Development of Chaophya Abhaibhubejhr Hospital

Case Studies	<i>Ba</i> : main context of interaction (of LW & MST)	S Socialization Tacit-Tacit	E Externalization Tacit-Explicit	C Combination Explicit-Explicit	I Internalization Explicit-Tacit
6. Folk/traditional medicine and Local Healers of Lanna	Community & University	Native to Chiang Rai, and with extensive experience working with rural community gave the initiator an insight of the value of folk medicine and local healers of the north and problems they are facing. He was determined to do an immense task.	Organizing of meetings and workshops for local healers to work together in the revision of folk medicine of the North enables them to meet and exchange knowledge and information of their practices. Then, research facilitators were able to work with them in collecting and codifying it.	Codified knowledge, then, was systematized and made into a series of four texts. More R&D effort was done by following the identified knowledge in those texts.	Researcher mentors worked with local healers by observing, and capturing their tacit knowledge during the selected cases in order to understand better the practices. Social and legal recognition bring self-confidence and self-esteem to local healers. Public can benefit from their knowledge.
7. Alternative Medicine and Herbal Product Development of Chaophaya Abhaibhubejhr Hospital	Community & hospital	The pharmacist upon working with local community to teach them how to use traditional medicine for primary healthcare was aware that villagers were far more knowledgeable than her on this issue. It made her shift from teaching to learning from the community. Sharing space and time together enabled them to have mutual understanding and respect.	Knowledge of traditional medicine she learned allowed her to create database of local herbal uses. She realized that this knowledge in the old people was disappearing. It was urgent to study and codify them in the local context. That was also how she went into the forest and learned with them of herbal medicine.	Later, she developed an herbal medicine from a local herb for child herpes. It is efficient and inexpensive. After the first success, there are many more products for medicine, food supplementary and toiletries. Traditional medicine service is also provided alongside the modern service at this local hospital	The duals mode of services at the hospital and herbal products receive good response from the public at local and national level. It becomes a learning place for local communities and other public hospitals. Local communities learn how to produce organic herbs for the hospital and are proud of their useful part of the mission of the hospital while earning extra income.

From the cases of academic initiative, we can see that researchers or scientists play important role in enabling the meeting of villagers and researchers to work together on the issues that are rooted in the communities (Socialization and Externalization). The process of knowledge conversion/creation is not as complicated as in the first category because the researchers are by themselves also the facilitators to allow the different steps in the process to happen by being patient and respectful to the “knowers”. The knowledge spiral is moved due to the trust and confidence the communities have in the initiators.

It is important to note that the new adapted knowledge resulting from the interactions is directly beneficial to the communities (Combination and Internalization). They even gain higher status or are recognized by the whole society including being legally accepted which enable more Socializations and other steps to come in the future activities of knowledge spiral.

In the case of Local Healers of the North, knowledge is codified into four texts in order to both collect the knowledge and create awareness and understanding in the philosophy and practices of folk medicine. The success has reached political agenda in including it in the National Health Reforms.

In the case of Herbal Products Development, the community has also directly benefit from both supplying raw materials of herbs to the hospital production unit and being able to choose the medical health care services at the hospital whether they want the modern or the traditional one.

With careful consideration and insights of local communities, the researchers in both cases have integrated LW and MST taking into account the human dimension that the local communities should benefit most out of these efforts. Apart from main discovery, the research reveals new knowledge and understanding of folk and traditional medicine that increase confidence in the traditional medicine in modern society. Traditional Thai massage and herbal uses are combined with “spa” business trend. It promotes local jobs, awareness of natural herbal resources for conservation and revival. Social relationships among local villagers at the family and community level are also strengthened.

Business Initiative: In these two cases the efforts are set out of philanthropic motivation, though they later, grow into remarkable and unique business productions.

8. Creative Rice Products

9. From A Weed to Innovative Furniture

Case Studies	<i>Ba</i> : main context of interaction (of LW & MST)	Socialization S Tacit-Tacit	Externalization E Tacit-Explicit	Combination C Explicit-Explicit	Internalization I Explicit-Tacit
8. Rice products	business firms & research institutes	Starting from personal inspiration on rice, the initiator worked with an old lady who knew how to make “young rice milk”. It became increasingly popular, and markets expanded. She needed more efficient way for improving production process and shelf-life of the product.	From a small team to work on young rice milk freshly made daily, their problems arose. She sought academic assistant to deal with problems in shelf-life and production process.	Her work coincided with the trend of promoting community products in the national scheme of “One Tambon, One Product” or OTOP. It opened opportunity for her to obtain technical advice and assistances.	Running the business in close touch to consumers gave her an insight of public interest on health products. Food science and technology allowed possibilities to extend product lines based on young rice milk. The contracted farms which feed chemical-free rice to her company are only “suppliers”.
9. Water hyacinth furniture	business firm & research institutes	A non-profit organization tried to help rural women earn more income using handicraft skill. It also recognized environmental problem caused by water hyacinth. So, it tried to work on a project that could tackle both problems.	A project was formulated based on these requirements. Problems of using water hyacinth dried stem are identified to find solution from scientific research. Tacit knowledge of villagers in weaving was considered to see to what extent it could be applied to the process of furniture manufacturing.	Handicraft skill in weaving of the villagers was combined with academic knowledge of the strength of the fiber and designing art. It gave birth to the world’s first furniture from water hyacinth.	The factory buys braided water hyacinth from villagers. They earn extra income from free natural resources. In this case, villagers only gain more skill in braiding faster. However, they do not involve in further product development or design. They are only “suppliers” of raw material to the factory.

Within this business context, it is found that villagers or communities are involved in the initial stage of the knowledge creation. In the case of Rice Creative Products, Sirin got a personal inspiration to do business concerning rice. Then, Pa (aunty) Prayong provided “traditional recipe” of young rice milk. From that point Socialization and Externalization occurred and it moved to the next step of Combination and Internalization through trial and error, and mainly not as mass or industrial production.

However, when the business reached the point to move further and faster to meet market demands, Modern Science and Technology were sought after by the business owners, not the villagers – from both cases. We can see that, then, local communities were cut off the knowledge spiral and their participation was to the business owners as the suppliers of raw materials to the production. Though in these two cases, owners of the business are considerate. However, the nature of doing business dictates the way raw materials should be prepared and the villagers only followed the guidelines and got training to better the supply of raw materials.

Then when business grew, the knowledge spiral occurred in another *ba*. It was the *ba* that business firms worked together with research or academic institutes. It was the *ba* that villagers were not a main actor. New adapted knowledge directly benefited business firms. The activity of sharing this new knowledge was not far and wide as it occurred in the community initiatives.

Conclusions:

1. The collaboration of LW and MST is most productive when the initiative is originated from local communities’ necessity and need. The driving force provided by LW allows the continuous movement of the knowledge spiral. LW acts as a *social engine* which represents a potential and energy of the communities to move in the desired direction and at an appropriate speed taking into account the relationship of everyone and everything, nature and the way to manage the acquisition of new knowledge from both inside and outside of their communities to solve their problems.

Fayard’s personal communication with the author in 2004 suggested that this is not a mere “Strategic Knowledge Community” or the community that is strategic and efficient in

creating new knowledge to meet their needs, but a “Fertile Knowledge Community”². He pointed out that fertile condition comes before creative ability. The fertility of LW enhances the community’s creativity. Roots can go deeply and firmly because the soil is fertile and provides good condition. Seeds can grow, are welcome and thriving. Creativity is possible and sun and rains from outside (e.g. modern science and technology, government, academic, and research institutes) can add into it to foster the growth until the harvest time comes.

Simply, since the initiatives are from local communities, they can shape their own development without waiting for government’s help nor having to rely on development activities created from somewhere else. It is an anarchist society to a certain level as many NGO workers and social thinkers make a reflection on the communities’ action (Nartsupa and Chanikornpradit 2003).

Initiators play an important role as natural leaders in engaging community members to collaborate with trust and confidence. To move the knowledge spiral within the context of rural community, these issues of community’s initiative, natural leaders/initiators and LW as *social engine* are crucial components for the success. From the case studies, especially, in the case of Noodle Dough Factory, money was not the main problem in development. With trust and confidence in the leaders even a few million baht could be raised to build their factory.

2. The point that “traveling” appears regularly within community initiative reflects the intention, determination and aim of the individuals or communities to solve the problem. They were confident in themselves that they could access, gather and integrate knowledge and make use of it. It was also confidence in others that they could provide them “knowledge” they did not have. Villagers were aware that what they did not know was important and could be the key to the solution of their problems.

This “shared aim and goal” provided a *ba* or Strategic Knowledge Community. Community members gathered and made available necessary means to achieve the project; and traveling allowed more

² This concept is developed in a book by Pierre Fayard to be published in 2005 about the Japanese’s way of Knowledge creation.

people to involve as well as to make the project or activity broader than simply limited in a small group or a local basis.

3. When activities are not originated by the intentions and aims of the communities, there is less chance that LW could perform its “*social engine*” or driving force for the communities. There is neither inspiration nor control in moving them within the knowledge spiral and to set off for the knowledge frontline. Then, local communities do not create their own new, adapted knowledge as when they have inspiration and control over the initiative and the course of action.

However, within this study, two case studies of academic initiatives revealed that the initiators were exceptional in their quality to understand and have the empathy and insights of local communities. Otherwise, outside initiatives to the communities would be accepted and practiced by the community only as long as the length of the project.

Fayard (2002) stresses the importance of “strategy framework” that could be adapted to this context. He specifies three levels of leading an activity to achieve the goal i.e.

- **Policy or Political level** – It is the “end or aims” that answer to the question “WHY?” This level means “intention”. In the community initiative perspective, it shows that the intention in itself is much more powerful than the previous knowledge and know-how.
- **Strategy** – It is the “way and means” that answer to the question “HOW?” This level is the possibility to integrate heterogeneous means, actors, methods, etc.
- **Tactics** – It is the moment to act or “WHEN and WHERE?”, and to execute the action.

He offers an analogy of this strategy framework to the Chinese archer who chooses the target (aim) and to use the bow (how) to shoot his arrow right at the target (when and where). People may formulate grand projects with great policies and brilliant strategic device (such as campaigns and development projects)...but without an arrow, hence there is no achievement.

4. Why Local Wisdom is wise? It may be a question arising in anybody’s mind who does not have an opportunity to immerse

oneself in the community context or have a first hand experience. LW is not only an amount of accumulated knowledge from the past. Its innate qualities of potential as *social engine* provide a way to act. It is a method that makes the knowledge dynamic and keeps the community to survive and to live well and in harmony with people, nature and super-natural forces for centuries, as LW always enriches itself with new knowledge from inside and outside of its context.

Usually, it is not always clear or obvious to draw the line what LW is and what MST are, or when MST are assuming the role as a complementary and/or a catalyst in providing the needed knowledge and information to local community. Panich (2004) points out that it is more productive to think of community problem solving as a knowledge creation process regardless of what system certain knowledge represents. Knowledge Creation process and Knowledge Management make possible and provide a “user-based” knowledge. This is a foundation for a Knowledge Society

5. All the case studies show that LW supports “Knowledge-Based Society” or Knowledge Society concept for modern Thailand. Nevertheless, the community’s action is not aimed at achieving a knowledge-based society and sustainable development to meet these modern discourses. These issues are intrinsically embedded within the activities which are aimed at a well-being and harmonious community. Consequently, the perspectives of Knowledge-Based Society and Sustainable Development can be ultimately achieved when LW collaborates with MST from the community’s initiative and within a “*ba*” that allows the co-intelligence of interaction and transformation of both LW and MST. LW has reflected its capabilities as a *social engine* related to Knowledge-Based Society and Sustainable Development in these following dimensions:

- *Environmental Dimension* – Concerns for nature and environment are embedded within LW. It is the intrinsic nature of LW to be holistic. This traditional value will ensure the environmental-friendly activities.
- *Economical Dimension* – Knowledge and know-how of LW make it possible to create jobs and income to local communities. Especially, knowledge in traditional medicine has high potential to decrease expenses in importing modern medicine and medical technology. People can adhere to “good health” approach which is economical in itself that

make a healthy Thai society as a whole. The trend of “spa” even adds value to the traditional massage and the use of herbal products. It is most obvious in OTOP project that LW and MST are put together in order to promote community economy.

- *Social and Communicative Dimensions* – Experience and confidence in ancestral wisdom, however being open to the enrichment of another knowledge system such as MST, allow the bridging of LW and MST in a co-intelligent manner. Local community and scientific community are connected in the collaborative process; and communication between them allow the flow, the exchange, mutual learning, mutual respect, and the transformation of knowledge that give rise to a new, adapted and useful knowledge.

The success stories attract mass media attention to popularize the stories. It is a way to create awareness in society and to make the stories known to a wider audience which allow more knowledge sharing possibility.

- *Cognitive and Cultural Dimensions* – A cultural dimension of LW in rice farming, handicraft, organic farming, traditional medicine and its social dimension in creating social cohesion shine out of its resurgence. MST and scientific methods allow modern society to understand the properties and validity of LW of which people in contemporary society can relate to. Knowledge has to be used in order to exist. Since LW is used and maintained its valued in the cultural context, it can sustain its life and continue to enrich and be enriched by other kinds of knowledge, not necessarily limited to MST.

These dimensions demonstrate that LW and MST can perfectly complement one another in this context of community development in the perspective of Knowledge-Based Society in order to achieve Sustainable Development.

6. From all the case studies, it can be concluded that the further the development activities move away from “community initiative/initiators”, the less knowledge creation between LW and MST can benefit the community. Local communities will only be the suppliers of raw materials or cheap labors using their own community resources to benefit modern society. Though economic dimension is created, other dimensions in item 5 are weakened

resulting in unsustainable development as it happened in rural development in the last 40 years.

7. The roles of NGOs and scientific or research institute are very important in working with local communities from the beginning. Most of the community development context does not have formal science communicators who could act as mediators to match LW with MST. Usually, NGOs have played the roles of both mediators and facilitators in community development.

NGOs can even trigger the need for changes for community initiative development. Along the process, NGOs can facilitate the activities as well as provide access and networking with relevant organizations. The government has recognized the role of NGOs that they can be useful, especially in the “cool” movement of the poor rural communities.

In the context of academic initiatives, this study does not find the role of mediator in matching LW and MST. And in the context of business initiative, a mediator seem to be an irrelevant factor since the business owners know the available sources and can access such technical assistance. Moreover, public research institutes or academic institutions are aware of their responsibility in helping SMEs. A role of a mediator and facilitator to support the integration of LW and MST the academic and the business contexts, however can be promoted in order to achieve a better rural community development.

8. PCST can contribute greatly to the important moment and context of community development that LW and MST are working together in the knowledge creation process.

The “Deficit Model” is not relevant to this context of the study because each case and each development context is too specific to benefit from generalized communication. It is not that “the village community does not have enough scientific knowledge to perform their daily life”, but it is mainly the issue of empowering them to gain accessibility and benefit from knowledge that they can integrate to the existing knowledge in order to solve their problems.

The recent models of Public Communication of Science and Technology focus on the discussions of Engagement Model and Lay-Expertise Model, and it is mostly done in the context where

science and technology are highly promoted. Considering the limitations of such models to the Thai context, this study proposes a “Co-Intelligent Model” to be used in the context where LW and MST will work together taking into account the needs and conditions of rural community.

In this perspective of “Co-Intelligent Model” development practitioners and involved parties have to recognize the potential and ability of local communities. It is of prime importance to facilitate local communities to be aware of their own needs for change. This effort has already been initiated by many NGOs in many parts of the country. It is proved in many instances both within this study and others that when local communities recognize their needs for change, sustainability in various dimensions is higher than from imposed development.

PCST in rural community development does not exist for promoting the glory, wonder, appreciation or marvel of science and technology. PCST can play the role of promoting awareness among all involved parties on how MST are relevant and can be beneficial to the daily life and problem solving process of the communities taking into account the co-existing of LW that has been passed down from generation to generation, but with potential and ability to equally enrich and being enriched by other knowledge systems.

Research Limitations:

Within this study, all case studies were selected with the consideration of their success in the collaboration process between Local Wisdom and Modern Science and Technology. It was based on the purpose and attempt to identify processes and factors that make the collaboration a success in order to provide a framework for such effort, and in the hope of providing a perspective that can benefit directly and largely to rural community.

For this reason, this study lacks offering the unsuccessful cases to enable the comparison of why and when the collaboration and creative dialogues of LW and MST work or do not work.

Suggestions for Future Studies:

Mostly studies of integrating LW and MST are done within the context of economic development. This dissertation is only a humble attempt in trying to identify the process and factors of such integration within the rural community context. There are many aspects and factors in the collaboration that lack research evidences to be used in planning for future rural community development, for example:

- Factors and mechanism in promoting the collaboration or creative dialogue between LW and MST to optimize the benefit for rural communities, especially when the activity takes place further away from the context of rural communities (as in academic and business initiatives).
- Roles of mediators and facilitators, who should take this role and responsibility, whether they are important or to what extent they are important in fostering the integration and transformation, and how to promote these roles.
- Role of Sub-district Administration Council (Or.Bor.Tor) which becomes more active in local administration and development because of the new Constitution and decentralization of Central Authority. This Sub-district Administration Council acts as a gatekeeper and trend setter for community development. They are authorized to use budget from the local revenue collected from local community. However, they mostly use it on building infrastructure rather than on projects that will directly empower the communities. The Sub-district Administration Council is also responsible for the ICT project that the government promotes for rural development, for example, the accessibility and facility for internet and computer nationwide.
- Study of the impact of mass media in creating public awareness of this community development perspective using LW and MST among local communities.

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PERSONAL COMMUNICATION

For Case Studies

1.

Agriculture and Food	Name/Address	Time/duration
1. Rice Varieties Improvement	1. Mr. Sinchai Boon-Art, Nong Payom Village, Tapan Hin district, Pijit (upper Central), Tel. 66-56-627 802	2003-2004
	2. Mr. Daycha Sriphat, Khaow Kwan Foundation, Suphanburi, Tel. 66-35-597 193	2004
	3. Knowledge Management Institute (KMI), Bangkok, Tel. 66-2-298 0455	2003-2004
2. Rice Creative Products	M.L. Sirin Rongsong P. Green Herb (2001) Co.,ltd. 83/116-117 Ngamwongwan Road, Bangkok, Tel. 66-2-589 7171	2004
3. Herbal Uses and Integrated Farming	Mr. Damrongsak Choomsangphan, Baan Samoon Prai Thai, Payoop sub-district, Wangchan, Rayong, Tel. 66-1-938 8189	2004
4. Soil Replenishing: From Sky to Earth Project	1. Mr. Sutthinan Pratchayaprut, Baan Pak Chong Village, Sanamchai sub-district, Satuk, Buriram, Tel. 66-44-782 313 2. Prof. Vicharn Panich, KMI, Bangkok, http://www.kmi.or.th 3. Project coordinator	2003-2004

2.

Traditional Medicine	Name/Address	Time/duration
1. Folk/traditional Medicine and Local Healers of Lanna (the Northern Region)	1. Dr. Yingyong Taoprasert School of Traditional and Alternative Medicine, Rajabhat Chiang Rai University, Chiang Rai, Tel. 66-53-703 388 2. Leading Local healers of Lanna: Por Mor Surachat Rakmanoot, Por Mor Som Chantarit, Por Mor Samran Mafoo, Por Mor Chan Tamakaew	2003-2004
2. Traditional Medicine and Herbal Product Development of Chaophya Abhaibhubejhr Hospital	1. Pharmacist Supaporn Pitiporn, Chaophaya Abhaibhubejhr Hospital, Prachinburi, Tel. 66-37-213 610 http://www.abhaibhubejhr.org 2. Marketing Manager of Herbal Product Development Unit	2003-2004

3.

Handicrafts	Name/Address	Time/duration
1. Indigo Dyed Textile of Mae Theeta	1. Prof. Charnchai Limpiyakorn, Program Director, Science and Technology for Rural Community and Sustainable Development Program, National Science and Technology Development Agency (NSTDA), Tel. 66-2- 564 7000	2001-2004

	<p>2. Dr. Anurat Saithong, a researcher of Rajabhat Sakon Nakon University, Tel. 66-42-716 751</p> <p>3. Mrs. Prapaiphan Dangjai and Mae Theeta, Panna Nikom Village, Sakon Nakorn, Tel. 66-6-974 6002</p> <p>4. NSTDA Project Coordinator</p>	
2. From a Weed to Innovative Furniture	<p>M.L. Pawinee Santisiri and Mr. Suwan Khongkhunthian, Yothaka International Co.,Ltd., Bangkok, Tel. 66-2-679 8631</p>	2004

4.

Community Micro-enterprise	Name/Address	Time/duration
“ <i>Kanom Jeen</i> ” Noodle Dough Factory: A Community Micro-enterprise	<p>1. Mr. Viroj Kongpanya Food Products Network Co., Ltd., Garaw sub-district, Nobpitam, Nakorn Sri Thammarath,</p> <p>2.Mrs.Patcharee Tangtrakool, a researcher from Kasetsart University and Project leader on Thai Industry Technology Development (funded by NSTDA)</p>	2003-2004

Policy Issues:

Dr. Chatri Sriphaiphan, Deputy Director, National Science and Technology Development Agency, 2004, Bangkok.

Professor Vicharn Panich, Director, Knowledge Management Institute, 2004, Bangkok.

Buddhism:

Ms. Watcharee Panwuthikorn, Buddhism Instructor, 2004- 2005, Bangkok.

ANNEXES

A. Glossary

Aphisek The coronation ceremony, a royal practice based on the rites of Arayan rulers of India brought to the Thai court by Brahmin priests from Angkor since Ayutthaya period (1350-1767).

Baan samoon prai thai means “a house of herbal plants that set life free”. The word “thai” here is written differently from the word “Thai” which means a nation. This particular word literally means “freedom”.

Benjarong Five-color hand painted porcelain with Thai designs. It was made according to Thailand’s order and designs from China.

Buddhism and its important concepts

(more detail in Chapter 3)

Boon Merits or good deeds, *tum boon* is making merits or good deeds

Dharma or Dhamma refers to Buddha’s teaching which has as many as 84,000 doctrines.

Metta Benevolence, willingness to help others

Prajna or panna Wisdom

Samadhi Meditative concentration

Sila	Moral disciplines
Four Noble Truths:	
	Dhukka , the reality and universality of suffering
	Samudaya , the causes of suffering
	Niroddha , freedom and non-attachment to suffering
	Marga , the path that leads out of suffering (Noble Eightfold Path)
Karn chareon sati	The practice for the development of consciousness or mindfulness
Kalayanamitara	refers to compassionate friends whom one can seek for help
Yonisomanasikarn	refers to analytical and critical reflection within one's mind profoundly to understand the problem as its actuality.

Chang sib moo	refers to “artisans of ten craftsmanship” under the royal patronage since Ayutthaya period (see more detail in Chapter 3).
Chao baan	Literally means villagers or common people
Chao na	refers to farmers who grow rice. Rice farming is “ <i>tum na</i> ”
Chao rai	refers to farmers who grow short life crops. Their practice is “ <i>tum rai</i> ”.
Chao suan	refers to farmers who grow fruit trees and vegetables. Their practice is “ <i>tum suan</i> ”.
Gor koh	It is a label for modern developed rice varieties, usually followed by a number, for example, <i>Gor koh 1</i> and <i>Gor koh 2</i> . Actually, the label comes from the first two Thai alphabet (like a and b in English).
Hom Mali	or “Fragrant jasmine” is a popular indigenous rice variety.

Jai Literally means heart, a plethora of compounds of *jai*, as in:

Hen jai “to see the heart” means to sympathize.

Jai yen yen, “Keep your heart cool” or “Take it easy, don’t worry too much, there will be a solution to your problem.”

Kreng jai, a reluctance to disturb other people by any action that is for one’s own benefit.

Nam jai, “Water from the heart” means sincere consideration and willing to help without expecting anything in return

Noi jai, “little heart”, to feel somewhat hurt by another’s action that does not take one’s feeling into consideration.

Poom jai, to be proud of someone or something

Kanom jeen refers to traditional rice noodle that is consumed in every region of Thailand, but with different recipes and curries to go with it.

Karn baud paa or “a ritual to ordain the forest” is an activity in combining Buddhist concept with environmental campaign to raise forest back for community and use it in a sustainable way.

Karn seub chata mae nam or “a ritual in prolonging the life of a river” is an activity in combining traditional belief with environmental campaign to raise awareness in keeping the river clean.

Khao agart is the name of an indigenous rice variety, it literally means as white as air

Khaow kwan refers to sacred rice in a ceremony to please the Guardian Angel. It is also the name of a foundation/NGO working closely with farmers in promoting sustainable agriculture.

- Khaow ploog*** refers to rice seeds for planting.
- Khon tham boon wad ruam kan*** or “people who go making merit at the same temple” literally means people who belong to the same community or being in the same society.
- Klum*** Literally means “group”. It usually refers to the state-initiated groups as an instrument or channel of administration and dissemination of official policy. Sometimes villagers sarcastically make fun of this word by putting higher intonation to it, and the meaning changes into “worried”.
However, NGOs’ concept of “klum” is different. It is used as a power instrument in the hands of villagers.
- Klum mae baan*** the Housewives Group
- Klum yuwakasetakorn*** the Young farmers Group
- Kraii krai ka chang, ka; kraii krai ka ma, ka*** or “one who wants to sell elephants, one can do it; and one who wants to sell horses, one can do it.” These words appear on the stone inscription of King Ramkhamhang, Sukhothai Period. It showed that in the past Thai citizen enjoyed the freedom and were free citizen.
- Kreu khai praad chao baan*** or a “village philosophers or wise men network” is an informal network that local wise men of various communities communicate and collaborate among them to share their problems, experiences and solutions to the problems.
- Krung Thep*** means “City of Angels”. It is how the Thais calls its capital and never refer to their capital as “Bangkok” as foreigners usually do.
- Kwam roo*** refers to knowledge which can be acquired through connecting various information using logic and operational rules. Knowledge is related to intelligence and can be taught and learned in an educational institution (see more detail in Chapter 4).
- Kwam Sanook*** refers to a sense of pleasure, enjoyment or happiness that must be present in either leisure or work.
- Kwan*** A spirit to protect one being (human and animal)

- Kwan haai*** losing ‘Kwan’, being ill or frightened means losing mental equilibrium that ‘kwan’ provides.
- Lai sap lai son*** “Many rings and layers” literally means complex.
- Leung on*** is the name for an indigenous rice variety, it literally means “mild yellow”.
- Long khag*** refers to reciprocal labor within a community. It is more prevalent in some agricultural tasks such as in rice harvesting. Community members take turn in working in each other’s rice fields until all the rice in everybody’s field is harvested. A similar word “*ao rang*” also has the same meaning.
- Maha wichalai, Maha chevalai*** are mocking words to “Maha wittayalai” or a university. Villagers in various places have established their own learning places for non-formal learning in the communities. The two words mean the great place to learn about life, while the original word means a great place of knowledge.
- Mai pen rai*** literally means “Don’t worry, it doesn’t really matter.” It is often used when one tries to make the others feel more relaxed of the problem at hand.
- Mon ya*** (*mon* = hill, and *ya* = medicine) It refers to a hill that is the place for abundant medicinal plants.
- Mor*** or “doctor”. Usually in folk and traditional medicine, local healers are called “Por Mor” or Father Doctors signifying their roles as providers and healers, not business-oriented.
- Mudmee*** is a special kind of traditional textile Thai motif. *Mud* means to tie and *mee* means tiny. The word *mudmee* describes the way of designing the pattern by binding silk or cotton thread using tiny robe. After dyeing, the tiny robes will be taken off and the designed pattern appears. In Indonesia it is called *ikat*, and in Japan *shibori*.
- Nai naam me pla; nai na me khaow*** or “in the water there is fish, in the field there is rice.” It appears on the stone inscription of King Ramkhamhang, Sukhothai Period. It showed that in the past Thailand was abundant.

<i>Nang Maai</i>	Tree/Wood Nymph
<i>OTOP</i>	“One <i>Tambon</i> (sub-district), One Product” or OTOP is a national project initiated by the government after the economic crisis in 1997 aiming at encouraging each sub-district or <i>tambon</i> to produce community products as an alternative source of income generation.
<i>Pak tob java</i>	refers to a fast duplicating floating weed “Water Hyacinth”. It has this name in Thai because the plant was brought to Thailand from Java by the royal entourage visiting that country.
<i>Panya</i>	refers to wisdom. It is knowledge specific to a person’s experience. It is knowledge that transforms itself into wisdom.
<i>Pai kin khao</i>	“going to eat rice”, it literally means going to have a meal.
<i>Phaen din tham</i>	– <i>phaen din thong</i> means Land of Dharma – Land of Gold. It was the campaign of state-initiated, and punned by villagers as “ <i>Phaen din tho – phaen din thae</i> ” or Land of Desperation.
<i>Phi pu-ya</i>	refers to grand father and grand mother spirits in the northern belief.
<i>Phi ta-yai</i>	refers to grand father and grand mother spirits in the southern belief.
<i>Phoom panya tongtin</i>	or Local Wisdom. It is wisdom and insightful knowledge related to the land (see more detail in Chapter 4).
<i>Phra mae Kongka</i>	Mother Goddess of Rivers
<i>Phra mae Thoranee</i>	Mother Goddess of Earth (soil)
<i>Phra mae Posop</i>	Mother Goddess of Rice
<i>Plang tam kaset praneet</i>	or a “plot of land to do a fine and well-thought-of farming”. It is to demonstrate that the size of the land or the bad quality of the soil is not an obstacle to make a living, knowledge would help to make good use of it (see more detail in Chapter 8, Case Study 4).

- Plau-noy*** or “*Croton sublyratus*” is an indigenous plant that has been used for curing ulcers in Thai folk medicine for centuries.
- Plub plueng*** is a name of a tropical white flower. It is used to called rice at a certain stage that the seeds are approaching its full development into a complete grain for harvest. It is the rice at this stage that is used for making traditional young rice milk beverage.
- Pii – Nong*** *Pii*, older brother or sister, and *Nong*, younger brother or sister are terms for addressing others to show social interconnectedness. It is a pseudo-sibling relationship that is common in Thai society. It is more found in informal social relationship.
- Por*** or “father” literally means a well-respected man of his age, kindness and expertise.
- Praad chao baan*** or “village philosopher” is the term introduced by NGOs to honor villager wise men. However, within this study, “Local Intellectual” is used instead.
- Rai*** a measurement system of land, a *rai* = 0.14 hectare.
- Ruam took, ruam sook*** or “to share the suffering and happiness”, it indicates the act of willingness to belong to the group for better or for worse with empathy in the fate they are facing.
- Rong rien chao na*** or School for the Farmers. It is a school initiated by NGOs to provide an interactive learning for rice farmers in organic farming practice (see more detail in Chapter 8, Case Study 1).
- Rong rien chumchon Isan*** or Northeastern Community School. It is a community-initiated project (as a symbol, not limited to a place or time) to enable meeting opportunities to learn and solve their own local problems together.
- Sakdina*** *Sakdi* means ranking with a nuance of power implied, and *na* means rice fields. *Sakdina* refers to the rank and power of a person according to the land one owned.
- Seu*** can mean both honest or naïve to the point of ignorance.

- Sahabaan Khao*** refers to a rice bank activity initiated by a Buddhist monk in Surin in 1980s to help poor farmers and villagers.
- Siam*** the former name of Thailand. Siam was changed to “Thailand” in 1939, in the reign of King Rama VII.
- Sukhothai*** “Dawn of Happiness”, the first settlement of the Thai Kingdom. At present, it is the name of a province in the upper central part of Thailand.
- Suvannabhumi*** “Golden Land” refers to where Thailand is located on the Indo-China Peninsula.
- Tamra phra osod phra Narai*** “the Text of Royal Medicine of King Narai”, refers to the first Thai medicine book of Thai drugs recipes compiled in the reign of King Narai the Great (1658-1688).
- Tad teen hai kao kub kerb*** or “to cut one’s feet to fit the shoes”. It is a northeastern saying which means a person who is not aware of his own condition and trying to comply with others even it would mean to hurt oneself.
- Technoloyee*** western technology
- Wad or Wat*** refers to a Buddhist temple
- Waythee kon tam na*** or “Stage for Rice Farmers” is a gathering of rice farmers from various places to join occasionally in order to share their experiences aiming at promoting self-reliance and a better living.
- Wittayakorn karn plean plang peur karn peung ton eang***
in short, ***Wor Por Or (pak prachachon)***, literally means “a volunteer to promote changes for self-reliance (the lay people’s version)”. This word is to mimic official training activity, ***Wor Por Or*** organized by the Institute for Defense of the Kingdom. It is offered to civil officials and business persons. This rural community effort shows how villagers give importance to necessity for change and self-reliance. It is the concept promoted by NGOs and People Organizations (POs) around the country.
- Wittayasart*** western science.

B. Organizations

BIOTHAI Biodiversity and Community Rights Action, Thailand

CEM Center for Educational Museums, Thailand

Chaophya Abhaibhubejhr Hospital and Foundation, Thailand

CIDA Canadian International Development Agency

Educational Institutions in Thailand:

Chiang Mai University, Chiang Mai

Chulalongkorn University, Bangkok

Kasetsart Univeristy

Mahido University, Bangkok

Naresuan University, Phitsanulok

Rajabhat Chiang Rai University (School of Traditional Medicine and Alternative Medicine), Chiang Rai

Rajabhat Sakhon Nakhon University, Sakhon Nakorn

FAO Food and Agriculture Organization

ICTP Abdus Salam International Center for Theoretical Physics

IDRC International Development Research Council

IGC Intellectual Property and Genetic Resources, Traditional Knowledge and Folklores

IIRR International Institute of Rural Reconstruction, the Philippines

IMD International Institute for Management Development

Khaow Kwan Foundation, Thailand

KMI Knowledge Management Institute, Thailand

NFE Non-Formal Education Department, Thailand

NIA National Innovation Agency, Thailand

NESDB National Economic and Social Development Board, Thailand

NSCE National Science Center for Education, Thailand

NSO National Statistics Office, Thailand

- NSTDA** National Science and Technology Development Agency, Thailand, and its four national centers:
- BIOTEC** National Center for Genetic Engineering and Biotechnology
 - MTEC** National Metal and Materials Technology Centre
 - NECTEC** National Electronics and Computer Technology Center
 - NANOTEC** National Nanotechnology Center
- NUFFIC** Netherlands organization for international cooperation in higher education (and attached to NUFFIC is **CIRAN** Centre for International Research and Advisory Network)
- OECD** Organization for Economic Co-operation and Development
- ONEC** Office of National Education Commission, Thailand
- PCST** Public Communication of Science and Technology International Network
- P. Green Herbs (2001)**, Thailand
- Poor People Assembly**, Thailand
- SciDevNet** Science and Development Network
- SIF** Social Investment Fund, Thailand
- SPPF** South Pacific Peoples Foundation
- THAIHEALTH** Thai Health Promotion Foundation
- TRF** Thailand Research Fund
- TWAS** Academy of Sciences for Developing World
- UNESCO** United Nations for Education, Science and Culture Organization
- WCED** World Commission on Environment and Development
- WHO** World Health Organization
- WIPO** World Intellectual Property Organization
- World Bank**
- WWF** World Wildlife Fund
- Village Community Foundation**, Thailand
- UNDP** United Nations Development Programs

C. Thai Local Wisdom and Education

The Office of National Education Commission (ONEC) provides information on national policy concerning Thai Local Wisdom, education systems and the Constitution as the following:

Indigenous Knowledge For a Learning Society

In many cases, the term "Indigenous" is defined as "local", "tribal", and "native". Also Indigenous People are often referred to distinctive tribes of minority groups, such as the Aboriginal Australians, American Indians, Indicia, and so on. However, the term "Indigenous Knowledge" has a broader and more flexible scope of meaning.

What is Indigenous Knowledge?

According to the Center for International Earth Science Information Network, Indigenous Knowledge (IK) is local knowledge unique to a given culture or society. It is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given culture.

In Warren, D.M., and B. Rajasekaran's "Putting Local Knowledge to Good Use", Lori Ann Thrupp pointed out that Indigenous Knowledge systems are adaptive skills of local people, usually derived from many years of experience, that have often been communicated through oral traditions and learned through family members and generations.

How Important is the Indigenous Knowledge?

In the case of Thailand, Indigenous Knowledge is substituted by the term, "Local Wisdom" or "Thai Wisdom", which means the body of knowledge, abilities, and skills of Thai people accumulated through many years of experience, learning, development, and transmission. It has

helped solving the problems and contributed to the development of our people's way of life in accordance with the changing time and environment."

In the past forty years, however, Thailand's economic and social development has placed an emphasis on industrialization and technology, which depended too much on Western knowledge and know-how. Even worse, such misguided development brought along with it several serious problems such as trade imbalance, urbanization, cultural and environmental destruction, all of which affect the quality of life of the people.

The economic crisis that has occurred during the past three years was the outcome of such mistakes and caused us to reconsider, review and re-evaluate our social and economic development plan. We discovered that we had pursued Western way of development and entirely neglected our own indigenous or local knowledge, the splendid treasure that has played important roles in building the nation's unity and dignity. Now it is the time we should turn back to our own philosophy, our own culture, and our own indigenous knowledge which will be referred to as "Thai Knowledge" hereafter. Among our Thai Knowledge, "Sufficient Economy" the principle introduced by His Majesty the King of Thailand is highly acknowledged and being implemented nationwide to pave the way for sustainable development.

Types of Thai Indigenous Knowledge

The research conducted by many of public and private institutes indicate that our indigenous or Thai knowledge can be categorized as 10 fields of knowledge, namely agriculture, manufacturing and handicrafts, Thai traditional medicine, natural resources and environment management, community business, community welfare, traditional art, organizational management, language and literature, religion and traditions.

Before Thailand adopted the educational system from the West, we had had our own educational system which was informal and provided in three institutions; home, temple and palace. Parents taught children family occupation, social values and traditions while monks taught reading, morality and Buddhism. The palace was the place where all

kinds of the nation's classical art were developed, preserved and taught.

The distinctive features of indigenous education are, of course, learning by doing, learning through authentic experiences, individualized instruction, and happy learning, all of which are hardly found in the schooling system of education.

The Recession of Indigenous Knowledge

In retrospect, there are three main reasons why Thai indigenous knowledge has faded away from our Thai way of life. First, it was the system of education that we adopted from the West, which focuses on modern knowledge, such as mathematics, sciences, etc. Along with the system is the professional teachers, who have also been trained by the modern system of teacher training. Second, it was the lack of research and development in the field of indigenous knowledge. Most of the research both in educational and research institutes is conducted in the field of modern science. Third, the status of indigenous knowledge specialists was not recognized when compared to modern knowledge educators.

The Policy on Thai Indigenous Knowledge

The Office of the National Education Commission (ONEC), as Thailand's national education policy organization, has conducted research on Thai knowledge in order to revitalize and return it to our educational system.

We have proposed to the government the national policy on Thai knowledge, establishment of the organization in charge, establishment of the Thai knowledge learning centers, remuneration for Thai knowledge teachers, and the government's commitment to support the operation of the learning centers.

Our research-based policy was accepted by the cabinet, allowing the implementation of the policy through the main strategies as follows:

Strategy 1 Establishment of Thai Knowledge Council, which consists of Thai knowledge specialists, who will decide over the matters relating to a curriculum, instruction, and promotion of Thai knowledge.

Strategy 2 Establishment of the National Research Institute for Thai Knowledge and Education, which will promote the research on Thai knowledge.

Strategy 3 Establishment of Thai Knowledge Fund to provide support for the research, education and teachers of Thai knowledge.

Strategy 4 Promotion of Teaching and Learning Thai Knowledge in the three systems of education: formal, non-formal, and informal.

Strategy 5 Honoring and Rewarding Thai Knowledge teachers, who have developed their expertise through informal education or self-learning, so that they will be recognized at the same level as certified school teachers. They will be encouraged to set up their own learning centers to transmit their Thai Knowledge to the young generation in the community.

Strategy 6 Formation of the Thai Knowledge Information Network System to collect and disseminate information on Thai knowledge. The network will also be a channel that Thai knowledge learning centers can communicate and exchange information through the internet system.

The Constitution of the Kingdom of Thailand

Fortunately, in 1997 ONEC had an opportunity to propose the contents of education and culture during the enactment of the new Constitution. With strong support of many segments of the society, Thai knowledge was recognized as an important part in the Constitution.

Section 46 stated that Persons so assembling as to be a traditional community shall have the right to conserve or restore their customs, local knowledge, arts or good culture of their community and of the nation and participate in the management, maintenance, preservation and exploitation of natural resources and the environment in a balanced fashion and persistently as provided by law.

Section 81 The state shall promote local knowledge and national arts and culture.

Section 289 A local government organization has the duty to conserve local arts, custom, knowledge or good culture.

These prescriptions paved the way for all organizations concerned to revitalize the Thai knowledge and utilize it as a means to strengthen many communities once destroyed by misguided development.

The National Education Act

To comply with the Constitution, the National Education Act, which was also enacted on research basis, expands further the roles of Thai knowledge, referred to as "Thai Wisdom", in the educational system .

Section 23 Education through formal, non-formal, and informal approaches shall give emphases to knowledge, morality, learning process, and integration of the knowledge about mathematics, science, languages, vocational skills, conservation and utilization of natural resources and the environment. Most of all, knowledge about religion, art, culture, sports, Thai wisdom, and the application of wisdom is also emphasized.

Section 24 In organizing the learning process, educational institutions and agencies concerned shall enable individuals to learn at all times and in all places. Cooperation with parents, guardians, and all parties concerned in the community shall be sought to develop jointly the learners in accord with their potentiality.

Section 25 The state shall promote the running and establishment, in sufficient number and with efficient functioning, of all types of lifelong learning sources, namely: public libraries, museums, art galleries, zoological gardens, public parks, botanical gardens, science and technology parks, sport and recreation centers, data bases, and other sources of learning.

Section 27 basic education institutions shall be responsible for prescribing curricular substance relating to needs of the community and the society, local wisdom and attributes of desirable members of the

family, community, society, and nation.

Section 57 Educational agencies shall mobilize human resources in the community to participate in educational provision by contributing their experience, knowledge, expertise, and local wisdom for educational benefits. Contributions from those who promote and support educational provision shall be duly recognized.

ONEC's Policy Implementation on Indigenous Knowledge

Realizing that there exist in the community experts of Thai knowledge who have already operated their own learning centers, the National Education Commission has searched, selected, honored and promoted 30 local knowledge experts to be honored as the so-called "Thai Knowledge Teachers." They are representatives of diversified areas of local knowledge. These teachers must have accumulated their knowledge and skills for many years and been recognized for their contribution to the transmission of local knowledge to the communities. After being selected, they are required to organize a program of teaching Thai knowledge to young people and receive financial support accordingly.

Thai knowledge learning can be categorized in three types: Thai knowledge Learning Unit where an individual knowledge teacher operates his or her own learning center; Mobile Thai knowledge Learning Unit where the teachers will move from place to place; and Thai knowledge Learning Center where Thai knowledge teachers of various fields will take turn teaching at these rather large-scale centers.

Some Case Studies of Thai Knowledge Teachers

Case Study I Mun Samsi: The Promotion of Organic Agriculture Community

Born in a farmer's family of Yasothorn province in the northeast, Mun Samsi, like many other farmers, received only primary education. Realizing the danger of chemical fertilizers, Mun has developed his expertise in developing organic fertilizers made from decay of plants and animals. Further, he initiated the assembly of villagers for organizing

community business, community bank, and village fund. Some of his famous innovations are the production of toxic-free rice, herb medicine, etc.

Case Study II Srisawalai Khamrangsi: The Transmission of Weaving Art to Youths

Born as a rural village girl in Nan province in the north, Srisawalai also finished her education at only the primary school. However, she attended the non-formal education courses and is now pursuing her bachelor's degree in business management at a nearby community college. Srisawalai was selected by Nan province to attend a training course of vocational development for girls organized by Community Development Department. After the training, she took leadership in organizing a group of young girls to practise weaving by themselves. The group have developed the unique local style and pattern of cloth. Their products extended from plain material to table cloths, scarves, local costumes. They then initiated the natural dying colors made from tree barks. The number of group members keeps increasing and they are now self-sufficient in terms of economy. It is a genuine learning organization where members always search for new ideas and innovations to improve the quality of their products. The outcome of her endeavor is that her students in the group have acquired knowledge and skills in weaving, earned a living to support their families. Most of all, the village can preserve its local culture and wisdom.

Case Study III Amporn Duangpan: The Development of Community Welfare Fund

Amporn, born in Songkhla, the south of Thailand, also had only primary education background. He used to work as a janitor at a primary school while running his own rubber and fruit plantations. With his vision and progressive way of thinking, Amporn started a saving group or so-called a community bank of which villagers are members. He initiated a special regulation of the bank and has run the bank carefully for all villagers' benefits. While the country's economic crisis caused collapses in business at the national level, his community bank has surprisingly accumulated over 80 million baht in savings. He further initiated the welfare system for members, such as medical fee, wedding facilities, life insurance, and many others, by using the interests gained from running the community bank. His success made him known to the public and his initiative was

expanded all over the country. He is very often invited to transmit his knowledge and experience to other communities.

Conclusion

The indigenous knowledge or local wisdom enables lifelong learning in society. It not only strengthens the community's economic situation on the basis of self-sufficiency, but also moral values, and local culture among community people.

In the globalized world, it is certain that most of the contents in the internet will focus on the Western knowledge, ideas, and culture. However, if there is nothing done to promote the learning of local knowledge, our future generations will definitely not understand where we are in the world or even lose the root of their culture.

Education in the globalization age should therefore be the balanced integration between global knowledge and indigenous knowledge. Therefore, modern science and technology must go hand in hand with indigenous or local knowledge for sustainable development in any community, international understanding, and peace and harmony of the world.

<http://www.edthai.com/reform/mar20a.htm> Retrieved 19/4/2005.

Titre :Création de connaissance et développement durable. Un processus collaboratif entre la sagesse populaire et les sciences modernes.

Résumé : L'actualisation de la sagesse populaire dans son dialogue créatif avec les sciences et les technologies modernes se profile comme un enjeu majeur dans la société de la connaissance. En Thaïlande, le concept de « *Local Wisdom* » qualifie cette sagesse populaire, énoncée par ailleurs sous la formulation de « *Indigeneous Knowledge System* ». Ce dialogue créatif est à même de renouveler les pratiques de communication publique des sciences et des techniques, dont les modèles occidentaux trouvent leurs limites notamment dans les cultures asiatiques. A l'issue d'un état de l'art sur l'histoire et sur la cohérence interne de la « *Local Wisdom* » dans la société thaïlandaise, sur les stratégies de la communication publique des sciences et des techniques dans leur relation avec le développement scientifique et technique contemporain, et enfin sur la gestion du savoir et plus particulièrement sur le modèle japonais de la création du savoir, la thèse explore et analyse de manière détaillée neuf études de cas de dialogue créatif entre cette sagesse populaire et les apports des sciences et technologies modernes en vue de formuler des solutions durables à des problèmes de développement en Thaïlande. La proposition finale de la thèse considère l'opérationnalité de cette sagesse populaire dans sa version thaïlandaise comme un véritable moteur social sur un mode collaboratif à même de générer les conditions de ce dialogue créatif fondé sur la production de connaissances adaptées à la résolution de problèmes de développement dans une perspective durable.

Title: *Knowledge Creation and Sustainable Development: A Collaborative Process between Thai Local Knowledge and Modern Sciences.*

Abstract: *Time has come for development to be more inclusive of other knowledge systems than the dominant knowledge of science and technology. This study focuses on the synergy of collaboration between local knowledge of Thailand so called – Local Wisdom and modern science and technology which come from the West. It could open a new perspective for PCST to broaden its scope, renew methods to enrich and reach more people toward knowledge society and sustainable development for Thailand. The way LW, which is cultural laden, acts as roots or social engine in order to promote and create operational knowledge from local issues matching itself with MST appears as an alternative strategy for PCST in Thailand. The study offers comparative analysis of nine case studies to identify processes and mechanism of the co-creation of knowledge from the two knowledge systems by using Nonaka's SECI Model for Knowledge Creation, the concept of "Ba", and Fayard's Strategic Knowledge Community – SKC concept.*

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Key Words: *Knowledge creation, Public Communication of Science and Technology – PCST, Local Wisdom – LW, Modern Science and Technology –MST , social engine, Knowledge-based society, Sustainable Development.*