Chapter 3

Research Methodology

This chapter presents construction of methodology of the research. The aim of the research is to develop and test a solution concept. Therefore, in order to accomplish the research objective which is to propose a process and a defensive protection system for the Thai local community to manage and protect their traditional knowledge, a research methodology must be designed. Thus, this research follows a design-based approach. The design-based research is driven by the desire to increase the practical relevance of research which can be positioned as a research approach aimed at answering a particular type of research problem (Stam, 2007). A consequence of the design-based approach is that this research not only contributes to developing valid and reliable general knowledge, but also solves specific problems.

This research contributes to solving some specific (intellectual capital related) problems in the case of the Mea-hiya community. Therefore, the outcome enables improve community performance. The research aims at developing and explaining valid and reliable knowledge for solving a specific problem, which can be generalized into classes of similar problems in similar contexts. The research prescription is an investigative or heuristic nature "if you want to achieve Y in situation Z, then something like X will help" (Stam, 2007). The outcome of this research should be a solution concept of a defensive protection system for traditional knowledge of Mea-hiya community. This knowledge should not only be of academic value, but also appropriate and relevant enough to improve the community's effectiveness in conservation of their traditional knowledge. It should comply with academic rigor and practical relevance. Inherent to this objective, quality control will be a combination of criteria related to academic standards and practical appropriateness.

3.1 The Pre-design Stage

Previously, several related subjects, concepts and theoretical models have been investigated. The conclusion of literature reviews from previous chapters is presented in the Table 3.1. Those applications are not only results in prescriptive knowledge, but will also contribute to further explaining and grounding of the concepts and models that are used to create the research method.

Table 3.1 Literature reviews conclusion

Subjects	Contexts
Significance of Problem	Changing the way of thinking has led to the loss of local original TK.
	Thailand lacks method for protection of TK.
	The way of life in Thailand has been constantly changing.
	Lack of local cultural management to conserve the traditional knowledge.
Problem Statement: The case of Mea-hiya Community	The Mea-hiya community is the earliest known inhabitants and has the oldest ritual (Leang Phee: Pu Sae Ya Sae ceremony, one of the most important rituals in Chiang Mai).
	The loss of Phu Sae and Ya Sae ceremony at Suthep community caused by developments.
	The Mea-hiyas have rapidly developed their economic status leading to the loss of local TK.
	The Mea-hiya community had often at times, experienced big external misunderstandings of TK.
	The Mea-hiya community cultural council has flaws in managing traditional knowledge.

Traditional knowledge (TK) & related terms	TK definition: a community's traditional intangible heritage which has its own unique public domain characteristics.
	TK characteristic: it is built upon shared values and aspirations of a group of the people living in close contact with surrounding ecosystem which is preserved and transmitted through generations.
	The reason to protect TK: TK benefits national economies, improves the livelihoods of the holders and communities, and conserves the environment.
Infringement of TK	People adopt a new attitude in appreciating ownership of the community TK.
	Two main disputes: misuse and misleading of the community's TK & exploitation of TK without receiving any permission or sharing benefit to the community.
Scopes of TK protection in international levels	**UNESCO & WIPO frameworks:** the protection of TK under the theme of public domain property and IP mechanisms and encouragement of the community to apply 2 protection measures:
	Defensive protection, participation of communities and individuals and disclosure of information about patent registration, setting-up of TK database, amendment of patent laws
	Positive protection, including national sui generis system, use of model law on TK protection
Thai legal protection of TK	Thailand does not provide sufficient protection to Thai TK.
	Benefits from genetic resources are not shared to public.
Cultural management in Thailand	Government and educational institutes play roles and hold various cultural activities.
	Financial sources: government bodies, municipalities, local administrative organizations.
	Negative feedback from stakeholders: no good cooperation to integrate their national, regional and local operations, insufficient budget and insufficient legislation for cultural actions.

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Sustainable development	The community can compromise and connect well between the globalization and localization.
	The guidance manual is an implementation guideline for the community on how to implement the development plan in order to achieve long-term sustainable development.
Cultural diffusion, the development of Thailand and TK	Cultural diffusion is responsible for the transmission of culture and economical and social development indicating in integration of the world economical, social, and information system that makes each party interdependent of each other.
	The negative impacts of developments have changed the landscape of Thai society greatly, especially at village level including the Mea-hiya community.
Intellectual Capital (IC)	IC capital can be categorized into the *defense of cultural and artistic heritage*.
	The application is suitable for a non-profit organization (Mea-hiya community)
	Context specific: traditional knowledge is context specific of each community
	Pragmatic and quantifiable approach which requires participation from related stakeholders
	The process is flexible & basic to develop
	Provide a holistic view
	Requires knowledge management process
Knowledge Management and creation	Knowledge creation process plays an important role to assist the IC process.
	The four modes of knowledge conversion will be managed at various levels, e.g. individual, groups within the Mea-hiyas to create new knowledge and innovative ides to manage and protect the community traditional knowledge.

Risk management	Processes to identify, assess, manage, and monitor future negative incident and uncertainty. Risk management provides a process to find, consolidate and prioritize indicators and create a monitoring mechanism. An effective risk management can enable the Mea-hiya community s' decision makers to increase their knowledge about their timely options of uncertainty and mitigate risks of business failure.
Systems thinking	System Thinking provides the ability to see the whole organization in a holistic manner which is perfectly allied to IC approach. System archetypes (reinforcing and balancing loop) can be used to present a defensive system of the Mea-hiya community in a holistic picture. Supports a creation of a learning community. People will learn to express ideas and challenge themselves to contribute to an improved work environment. People can create the results they truly desire, and where they can learn together for the betterment of the whole.

3.2 Research Design

The previous chapter has reviewed several concepts and theoretical models. "Management theory is either scientifically proven, but then too reductionistic and hence too broad or too trivial to be of much practical relevance, or relevant to practice, but then lacking sufficient rigorous justification" (Van, 2004). According to Van 2004, the problem of academic theory and professional management can be mitigated by complementing explanatory science (explains and possibly predicts observable phenomena within the field) with design science (develops knowledge for the design and realization of artifacts to be used in the improvement of the performance of existing entities).

The core missions of this section are to develop a practical relevance of research methodology with the aims of solving a specific problem, to propose a solution concept and also to create new knowledge for the academic area and practical use. Based on the research objective and literature reviews, the conceptual frameworks and theoretical models are translated into an initial design of a method. The method basically consists of knowledge management process, intellectual capital process and risk management as theoretical backgrounds. These theoretical models are adapted to design and form an integrated eight step process method. This process will be applied and investigated in the Mea-hiya community systematically.

The first four steps are from the intellectual capital process proposed by Roos 1997. These four steps provide a method to identify the community's intellectual capitals. The second part of the process consists of another four steps. These four steps come from the risk management technique. These four steps provide a method for creating a surveillance system that encourages the community to be aware and alert in protecting their traditional knowledge.

The results from the eight steps will be analyzed in regards to the objectives of Thailand National Sustainable Development, UNESCO and WIPO. This will be based in terms of how the research designed process corresponds to the national and international framework. The results should provide an opportunity for the community to manage their traditional knowledge in a systematical, practical and sustainable fashion.

3.2.1 Structure of the Research

The integrated eight steps process (Figure 3.2) is applied within a specific situation to solve a specific problem, i.e. the situation in Mea-hiya community.
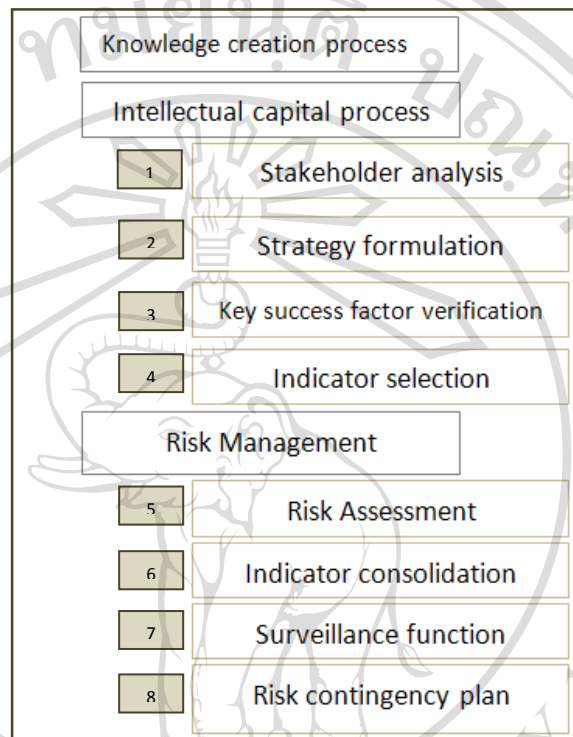

Figure 3.1 Eight step process

3.2.2 Research Ethic

The research received official permission from the Mea-hiya local government and the president of the Mea-hiya Community Cultural Council to conduct the research in the community. Fortunately, the cultural council also offered assistance to conduct the research. One of the local officers was assigned to be the research coordinator. The local government also provided official letters to the researcher to present to the interviewees in the community (see Appendix B). Thus, the research is an exploratory research, conducted in co-operation with the Mea-hiya Community Cultural Council.

3.2.3 Semi-structure Interview Questions

The theme of the semi-structure interview questions is formulated by using the results of literature reviews (see Appendix C). The document analysis, content analysis and thematic extraction are used to formulate the questions. The pre-test of the questions is examined for adjustment. In each stage, there is a different research design, sampling, tool, and technique. The research selects and applies proper research methods, both qualitative and quantitative, in each stage. The qualitative methods include documentary research, intensive interview, observation, and participation (Creswell, 1998). The quantitative method includes a questionnaire.

3.3 Research Investigation

3.3.1 Applying Knowledge Creation Process

This research plans to apply and investigate the knowledge creation process. In each step of the process, the four modes of knowledge conversion (socialization, externalization, combination and internalization) can be managed at various levels, e.g. individual, groups within the Mea-hiyas to create new knowledge and innovative ideas to manage and protect the community traditional knowledge. The four steps of knowledge creation must be encouraged through proper Ba. A proper shared space, which can be physical or virtual, is required. In the eight step process, the stakeholders must be involved to provide and share experiences and information to create new knowledge. The Mea-hiya community's strategies, key success factors, indicators, risks, and the plan to mitigate all risks should come from the community's key cultural stakeholders. Knowledge Management procedure is applied in conducting research as follows:

1. Creating the interview occasion: the researcher sets up a schedule of interviews. Data required is knowledge and experiences from key stakeholders. The researcher will prepare proper questions for the interview.

2. Knowledge Capture: the researcher will conduct interviews by asking questions to capture knowledge from the stakeholders and also record the data by using video and audio recorders. All data must be transformed to scripts for analyzing.

3. Knowledge Analysis: data from stakeholders (scripts) will be analyzed, based on each step objective.

4. Results validation: results of the investigation are validated by the stakeholders.
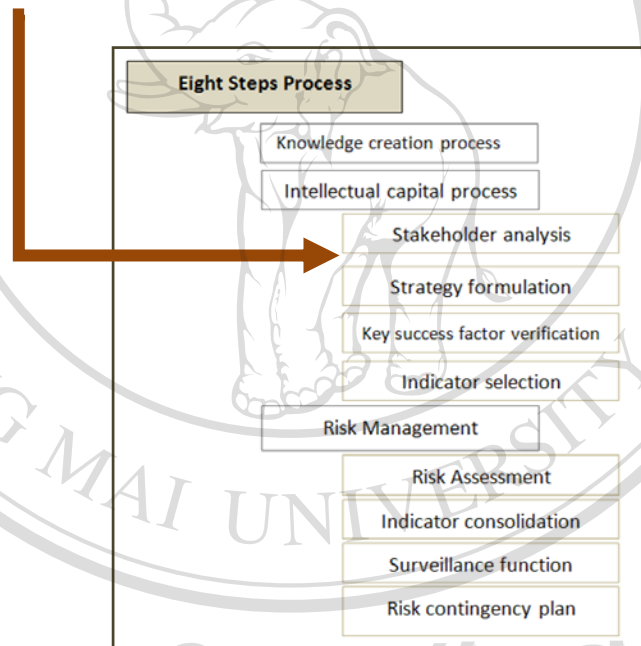
3.3.2 Step 1: Stakeholder Analysis

Figure 3.2 Stakeholder analysis

3.3.2.1 Identifying Stakeholders

The stakeholder analysis starts with the stakeholder identification process. The stakeholders may include any person or organization whose interest may be positively or negatively affected (Riege, & Lindsay, 2006). Because of the various stakeholders, the synergy between them is important for understanding the increasing levels of complexity for managing local activity (CBNRM Net., 2001). Thus, the stakeholders are very important to manage the community affairs.

The research plans to conduct three tasks in order to identify the key community cultural stakeholders.

Firstly, the researcher plans to participate in and observe a Mea-hiya community meeting. Participation and observation of community meetings allow the researcher to see interaction between the Mea-hiya participants. Each participant has his/her own characters and roles. The meeting is essential for the researcher to identify the key stakeholders and their roles.

Secondly, the researcher plans to conduct a documentary research. The documentary research studies relevant documents (the local government annual report, the Mea-hiya Cultural Council constitution and the meeting report). These documents and reports show the detail of cultural activities, names of participants and the budget.

Thirdly, the researcher creates the interview occasion to capture knowledge from the interviewees such as local authorities, local leaders, teachers, monks, politicians, and villagers, allowing them to express their opinions. The interviews are organized as follows:

Agenda 1: introduce the objective of the interview.

Agenda 2: the interviewee identifies the key community stakeholders.

Agenda 3: the interviewee identifies stakeholders' resources and roles.

The interviews provide basic information because the interviewees express their opinions and refer to some people who are highly involved in the cultural domain in the community. The socialization modes of knowledge creation process are applied in this step, via face to face conversation (Original Ba).

The content analysis and the thematic extraction are used to analyze the knowledge transcripts, related documents and the data from the participations and observations. These qualitative methods provide an identification of the community's key cultural stakeholders.

3.3.2.2 Analyzing Stakeholders

The next step is to analyze the stakeholders. The objectives of this step are to prioritize and identify the roles of the stakeholders. The research plans to conduct two tasks in order to analyze the community's key cultural stakeholders.

First, interview the locals as follows:

Agenda 1: introduce the objective of the interview.

Agenda 2: the interviewees express opinions about the stakeholders.

Second, the stakeholders are requested to fill out the questionnaire. There are four main questions which are related to the following - the power of the stakeholders (legitimate power, coercive power, reward power, informational power, and expert power), the influence of the stakeholders, the participation level of the stakeholders and the support level (provide budget, man power, material, and place) of the stakeholders (see Appendix D).

The questions are evaluated on three scales: one (low), three (medium) and five (high). The stakeholders fill out the answers on the scale that coressponds to their opinions. In this stage, the stakeholders knowledge is transcribed into a document and analyzed by using content analysis to identify roles of the stakeholders. The questionnaire answers are calculated from the score of four questions. In this step, the power and the influence scale are combined into a single element. The participation and the support scale are also put together into a singe element. These two elements will become the fundamental principle element to evaluate the stakeholders.

3.3.2.3 Prioritizing Stakeholders

Once calculation and combination are completed, then the stakeholders are prioritized based on the score that each one received. The research plans to adapt the power-interest grid (Rachel, 2007; Perrot, 1996) as an analyzing tool. The adaptation grid consists of two elements, power-influence element and participation-support element. The next step is to translate the highest priority stakeholders into the grid. The key stakeholders are prioritized based on who are deemed as the most important figure to the community's cultural domain. At this point, the research has accomplished identifying and prioritizing the Mea-hiya community's cultural stakeholders. The challenge is to focus on the right stakeholders who are the most important to the community's cultural domain, so they can be handled properly.
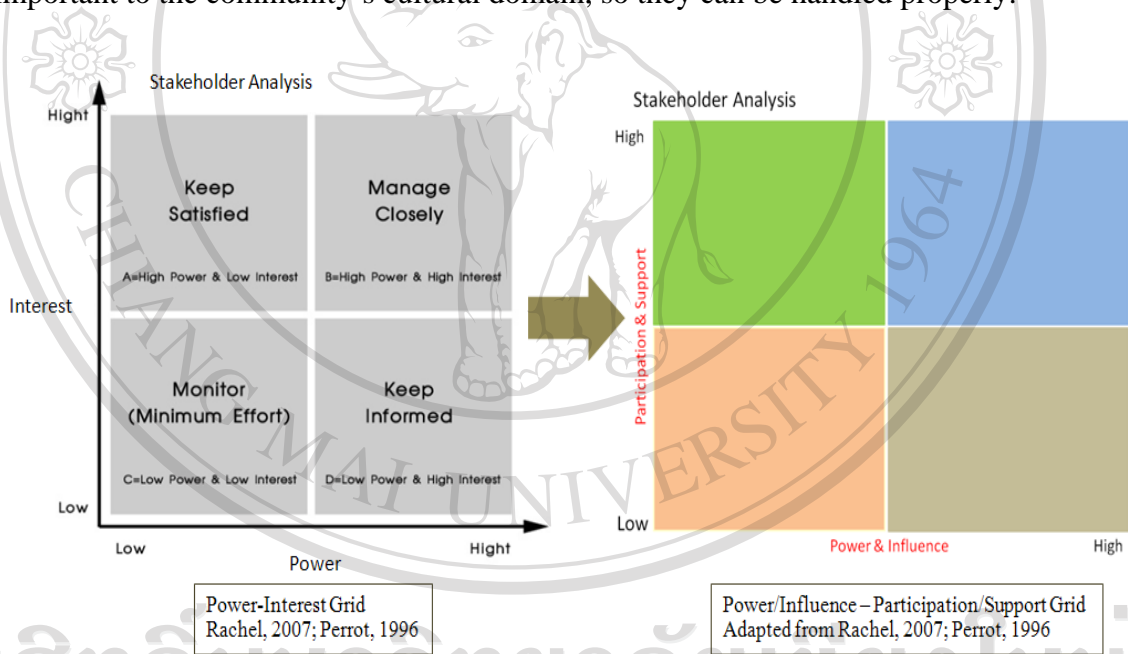

Figure 3.3 The prioritizing grid
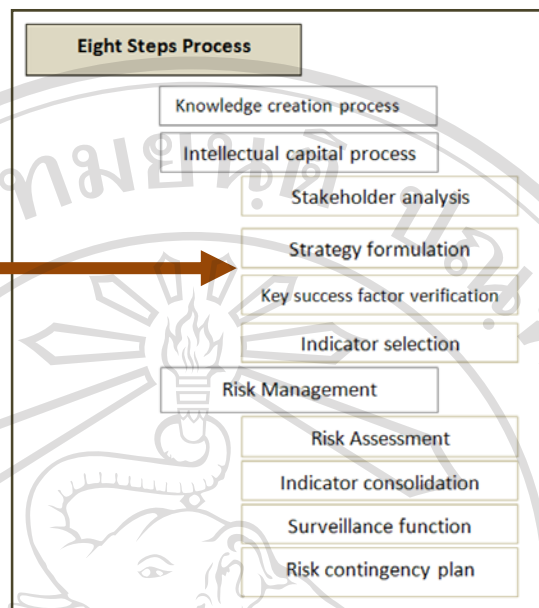
3.3.3 Step 2: Strategy Formulation

Figure 3.4 Strategy formulation

3.3.3.1 Identifying Stakeholders' Needs and Expectations

The Next step of developing the intellectual capital process is a business concept (Roos et al, 1997). It is necessary to identify the strategy of the organization because strategy is the way to accomplish the goals (Torres, 2006).

With no current concrete cultural strategies, and a lack of full participation from the people in the Mea-hiya community for managing their cultural activities, the research plans to adapt a new idea in order to create strategies. Instead of creating strategies from the top down, the stakeholders' needs and expectations of community traditional knowledge would be the key elements for creating the strategy to manage community traditional knowledge. In order to develop strategies and identify related issues, an organization should consult with targeted groups of stakeholders. The consultation provides a better environment to facilitate debate and develop more equitable strategies (Riege, & Lindsay, 2006). In order to do that, the organization needs to have a clear and transparent structure and process to keep stakeholders and their consultation focused (Byrne and Davis, 1998).

In this step, in-dept interviews are organized and conducted as follows:

Agenda 1: introduce the objective of the interview.

Agenda 2: the socialization and externalization modes are employed in this step via Interacting BA. The stakeholders are encouraged to express opinion to clarify their needs and expectations, meanwhile acknowledging the other's demands.

The interviews are recorded and pictures taken. After the interviews, transcripts will be made as soon as possible in order to add reflection on the language and other cues while still fresh in their memory. The content analysis and thematic extraction are used to analyze the data. Finally, the key stakeholders' needs and expectations have to be made into a written statement.

3.3.3.2 Formulating Strategies

The research arranges to conduct two tasks in order to formulate the community strategies. The combination and internalization modes of knowledge creation process are engaged in this step.

First is the combination mode. The results from the stakeholders' needs and expectations are categorized based on the shared ideas of the stakeholders. Needs and expectations in common are categorized into groups of main concept.

Next is the externalization mode. These main ideas from the stakeholders' needs and expectations would be the fundamental concepts for creating strategies of managing traditional knowledge. The fundamental concepts are translated into statements that define the community's cultural identity and future. The stakeholders should learn and acknowledge what needs to be managed in their community. Finally, at this point, the Mea-hiya community should receive the strategies for managing their traditional knowledge, which come from their own opinions.

In this step, the researcher must review and analyze the transcript and statements from the previous step. The content analysis, thematic extraction, and comparison analysis are implemented to analyzed data to formulate the practical strategies.

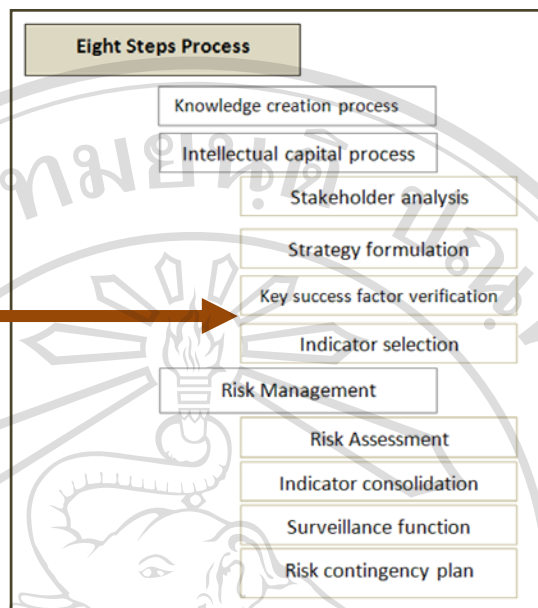### 3.3.4 Step 3: Key Success Factor Verification

Figure 3.5 Key success factor verification

The next step of the process is to translate the community's strategies into action plans which are indicated as key success factors. For successful implementation of an intellectual capital system, the process needs to link the selected intellectual capital measures to the strategies (Shulver, Lawrie, & Andersen, 2000). The strategies formulated in the previous step must be used to identify the Key Success Factors (KSFs). In each strategy, there must be KSFs (specific actions) to reach their strategic goals.

The research outlines to conduct interviews with the stakeholders in order to identify the key success factor. In this step, the stakeholders are interviewed and requested to identify the key success factor of each strategy. They are encouraged to indicate their knowledge intensively because KSF is important for making successful strategy. The interviews are organized as follows:

Agenda 1: introduce the objective of the interview.

Agenda 2: the stakeholders identify the key success factors.

The interviews are recorded and transcribed as soon as possible. The content analysis, thematic extraction and comparison analysis are implemented to analyzed interview data and identify key success factors. Finally, at this point, each strategy receives specific actions to reach the strategic goals which come from the key stakeholders.

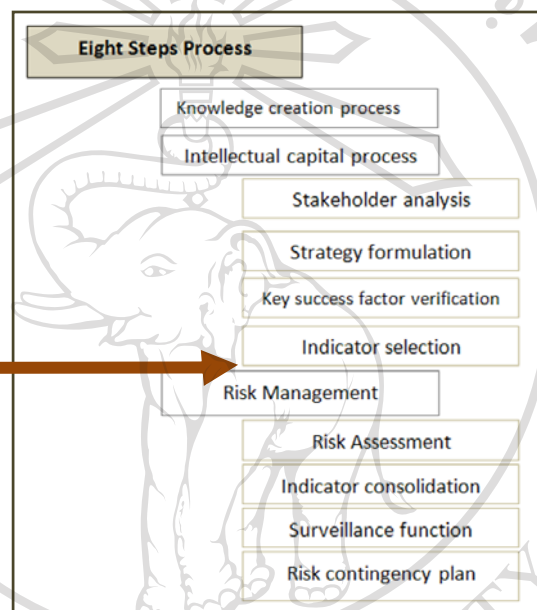### 3.3.5 Step 4: Indicator Selection

Figure 3.6 Indicator selection

The next step of the process is to measure achievement of each key success factor by putting indicators that reflect its purpose. The aim of measuring is to identify knowledge components of an organization in order to manage them so they can continually improve their performance (Marr, Schiuma, & Neely, 2004). Since this community is dealing with non-financial data, the difficulty in measuring intangibles stems from the indicators that have been selected as the proxies for the KSFs (years of experience, hours of training, and etc). Selecting the right indicators is very difficult, or near impossible, because the indicators must reflect KFSs drastically. However, appropriate indicators could be selected elaborately and carefully. In most cases, for each KFS, more than one indicator is needed to get a clear and correct picture (Roos et al, 1997).

In this step, the research arranges to conduct two tasks in order to select the indicators.

First, the researcher provides three examples of indicator to the stakeholders to help them to understand and have a clear picture of what the indicators are about, such as the amount of money invested in promoting cultural activities, the years of experience in performing the ritual, and the number of students participating in the cultural activity.

Second, the researcher plans to make a list of a possible forty indicators for the stakeholders. The stakeholders then selected the most appropriate indicators from the list (see Appendix E). The researcher will then count the number of the stakeholders who agree to the indicators. The indicators which received a score of more than fifty percent of the stakeholders will be selected as the KSFs' indicators. Finally, the indicators of the key success factors are indentified.

3.3.5.1 Defining Community Intellectual Capital

In this step, the research intends to conduct two tasks in order to select the indicators.

First, the researcher plans to analyze the indicator selected to define the community cultural capital. The indicator list is created to be analyzed and arranged by using content analysis and comparison analysis based on typology. The research analyzes and arranges the selected indicators according to the particular outlook of the community cultural intellectual capital. The selected indicators structure the form of capital and provide a holistic picture of the Mea-hiya community's intellectual capital and to address issues surrounding the true key drivers of value creation.

Second, the researcher plan to weigh the community's intellectual capitals in percentage term. The value of intellectual capital presented in percentage weight terms is an attempt to show how much a certain area contributes to creating wealth for the community in the eye of the stakeholders.

At this point, the research will reach the half way stage of the investigation of cultural intellectual capital management of the community's traditional knowledge.

The research has identified and analyzed the key stakeholders and evaluated the stakeholders values, conceived the strategies, key success factors, indicators and a holistic picture of the Mea-hiya community's cultural capital.

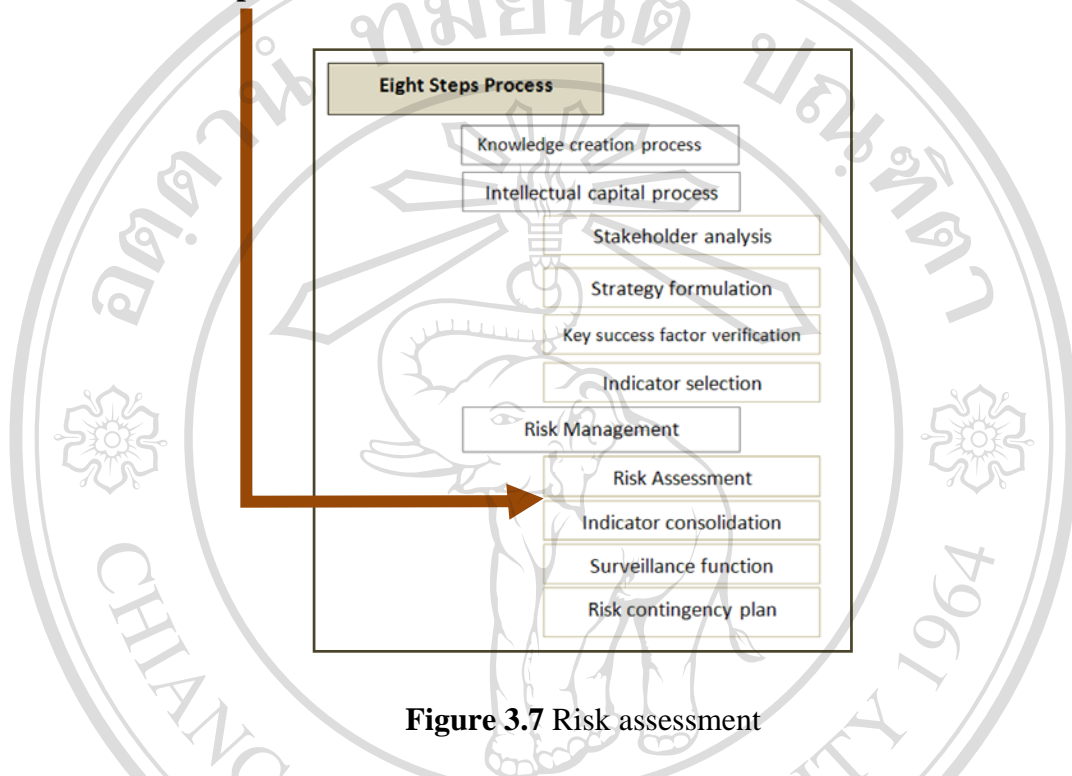### 3.3.6 Step 5: Risk Assessment

Figure 3.7 Risk assessment

At step 5, the research schemes to adopt risk management to consolidate the indicators. So far, the Mea-hiya community is able to develop their intellectual capital to manage their traditional knowledge. However, to measure the KSFs, with proxy variables, the indicators will be expressed in the most diverse units of measurement. Thus, the consolidation of all indicators into one smaller measure helps to improve the visualization of the value-creating processes of the Mea-hiya traditional knowledge management so they can be managed comprehensively (see page 70).

3.3.6.1 Identifying Risks

The first step of the risk assessment is the risk identification and assessment. The stakeholders are interviewed to identify risks and their root causes.

Agenda 1: introduce the objective of the interview.

Agenda 2: the researcher explains the use of KSFs to identify the risks to the stakeholders. The idea of the KSFs is an action that must be done. When there is a necessity for action, there are always risks of failure.

Agenda 3: the researcher interviews and asks questions of the stakeholders (see Appendix F).

Agenda 4: the stakeholders identify the risk of each KSF.

After identifying the risks, the researcher then analyzes the risks by using the content analysis and links the risks to the indicators. The risk identification provides the smaller number of indicators to improve the visualization of the value-creating processes of the Mea-hiya traditional knowledge management. The Mea-hiyas can focus comprehensively on the key indicators which relate to the risks. The risk identification also leads to confirm which intellectual capital is most important to the Mea-hiya community. The result is presented in the risk table.

Table 3.2 Risks identification

Strategy & KSFs	Indicator	Risk	Root cause
Strategy X: KSF 1 KSF 2	indicator	RISK	XXXXX
	indicator	RISK	XXXXX
Strategy Y: KSF 1 KSF 2	indicator	RISK	XXXXX
	indicator	RISK	XXXXX
Strategy Z: KSF 1 KSF 2	indicator	RISK	XXXXX
	indicator	RISK	XXXXX

3.3.6.2 Evaluating Risks

The evaluation of the risks is the next step. The research outlines to use traditional risk assessment technique. The research evaluates the risks on two scales: the likelihood and the seriousness;

The likelihood scale: the researcher aims at two tasks.

First, the stakeholders are interviewed. The socialization mode is engaged.

Agenda 1: introduce the objective of the interview.

Agenda 2: the stakeholders are asked about the probability rate of occurrence and the question is "how likely will that risk happen?"

Agenda 3: the stakeholders express their opinions on each risk.

Second: The stakeholders are requested to fill out the questionnaire (see Appendix G). This question is evaluated on a scale between one (rare), two (unlikely), three (possible), four (likely) and five (almost certain). The stakeholders fill out the answers on the scale that coresspondes to their opinion. The results will be presented in the likelihood table.

Table 3.3 Likelihood evaluation

Likelihood evaluation (Susceptibility to failure)

Risks		Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost Certain (5)
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
	Risk No. …					
		Likelihood				

The seriousness scale: the researcher aims at two tasks.

First, the stakeholders are interviewed. The socialization mode is engaged.

Agenda 1: introduce the objective of the interview.

Agenda 2: the stakeholders are asked about the impact of the event, how bad would it effect the Mea-hiya community if it does happen?

Agenda 3: the stakeholders express their opinions on each risk.

Second, the stakeholders are requested to fill out the questionnaire (see Appendix G). This question is evaluated on a scale between one (insignificant), two (minor), three (moderate), four (major) and five (catastrophic). The stakeholders fill out the answers on the scale that coresspondes to their opinion. The result will be presented in the seriousness table.

Table 3.4 The seriousness evaluation

Seriousness evaluation (Impact to community)

Risks	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					
Risk No. …					

Seriousness: Impact to community

In the next step, the risk assessment matrix is used to analyze the risks. The research calculates likelihood (possibilities) and seriousness (consequences) and ranks each risk in the risk assessment matrix. The combination mode of knowledge creation is engaged in this step. The stakeholders' knowledge about risk is combined. This step provides the understanding magnitude of the risk which leads to the risk ranking mechanism. Risk ranking uses a matrix that has ranges of seriousness and likelihood as the axis. The combination of a seriousness and likelihood range gives an estimate of a risk ranking. The risk assessment matrix is divided into seven zones, which are arranged based on priority order of risk severity to the community - red, orange, yellow, light blue, gray, light green and dark green zones.
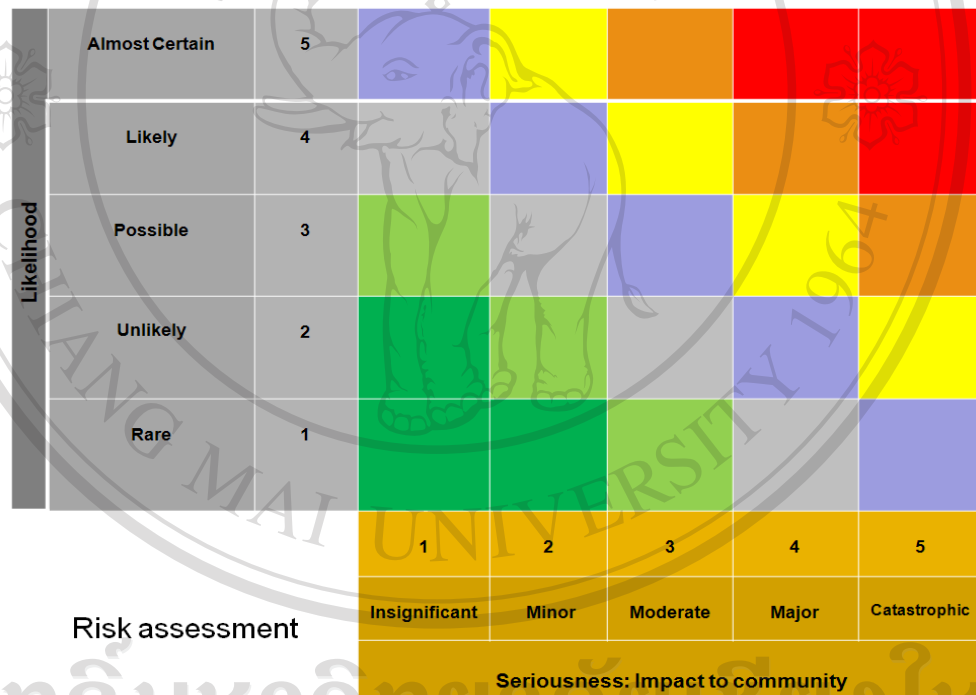

Figure 3.8 The risk assessment matrix
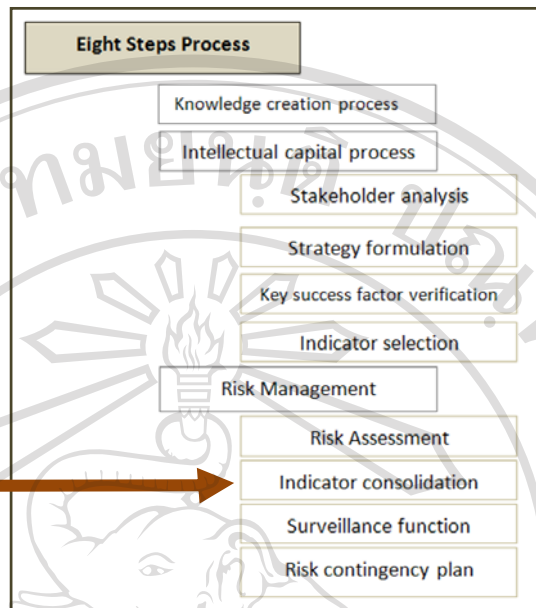
3.3.7 Step 6: Indicator Consolidation

Figure 3.9 Indicator consolidation

After the risks have been assessed, the risk ranking is created to prioritize the risks. The researcher designs the risk table to show the linkage between the risks, the indicators and the capital focus.

Table 3.5 Risk ranking

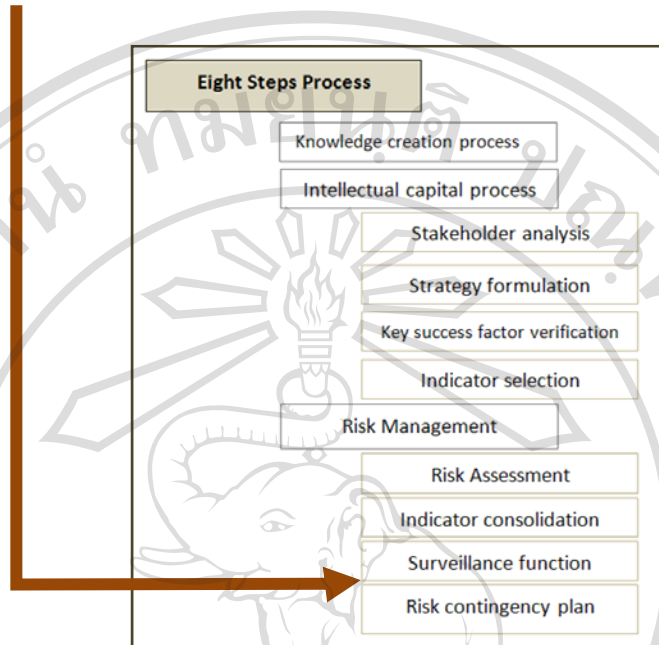| No	Risks	Likelihood	Seriousness	Total	Key Indicator	Capital Focus
1	Risk No. …				XXXXX	YYYYYY
2	Risk No. …					
2	Risk No. …					
3	Risk No. …					
3	Risk No. …					
3	Risk No. …					
4	Risk No. …					
4	Risk No. …					
5	Risk No. …					

3.3.8 Step 7: Surveillance Function

Figure 3.10 Surveillance function

The next step is to develop of the risk monitor index (the typical activation order of different levels of protection in response to a situation in the community). In order to develop effective mitigating measures, the researcher intends to conduct two tasks in this step.

First, the researcher designs a monitor index and presents it to the stakeholders. The risk monitor index will be designed into four levels to help the Mea-hiyas to understand how different levels of protection are awarded as a typical incidence develops (see Appendix H or Table 3.6). The first level is negligible (acceptable as is). At this level, the community feels comfortable and accepts the situation. The second level is the preventable level (acceptable with controls). At this level, the community has to make some actions to prevent a worse situation from developing and push the situation back to the first level. The third level is the undesirable level. At this level, the community must closely monitor and then solve the situation. The fourth level is the unacceptable level. At this last level, the community cannot accept the situation. A remedy and protective action must be implemented as fast as possible.

Second, the stakeholders are interviewed and requested to give recommendations.

Agenda 1: introduce the objective of the interview.

Agenda 2: the researcher explains the structure of the index.

Agenda 3: the researcher interviews the stakeholders.

Agenda 4: the stakeholders provide recommendations on the indexes.

In this step, the content analysis is employed to analyze transcript data.

Table 3.6 Risk monitor index

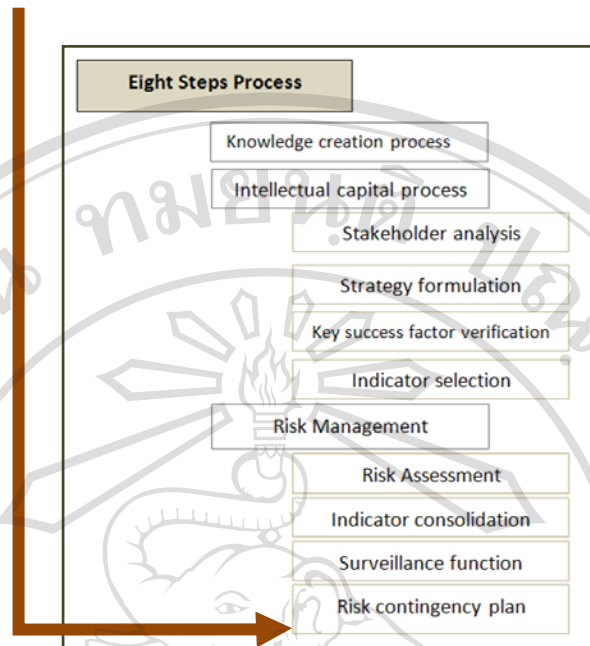|	Risk Monitor Index			
Risk No. ...				
Risk No. ...				
Risk No. ...				
Risk No. ...				
Risks Risk No. ...				
Risk No. ...				
Risk No. ...				
Risk No. ...				
Risk No. ...				
	Negligible (Acceptable as is)	preventable (Acceptable with controls)	Undesirable (Close monitoring)	Unacceptable (Remedy & Protection)

3.3.9 Step 8: Contingency Plan

Figure 3.11 Contingency plan

The next step of this research is to develop some contingency plans to manage the risks. In order to develop effective contingency plans, the research designs to conduct two tasks in this step.

First, the stakeholders are interviewed. The stakeholders are requested to provide ideas for the action plan to manage and mitigate the risks (see Appendix F). The contingency plan is created based on the stakeholders' knowledge which means socialization and externalization modes of knowledge creation are occupied in this step. To create the plan, the root causes, the indicators and the capital forms of the risks are reviewed as the key material.

Agenda 1: introduce the objective of the interview.

Agenda 2: the researcher explains the structure of the contingency plan.

Agenda 3: the researcher interviews the stakeholders.

Agenda 4: the stakeholders suggest actions to manage risks and the knowledge required for managing the actions.

Agenda 5: the stakeholders define the risk owners

Second, the risk contingency plan is designed from the stakeholders' suggestions which mean the combination and internalization modes in knowledge creation process are occupied in this step. The table is designed to present linkage between the risks, the capital, the risk zone, the key indicator, the action plan, the risk owner, and the knowledge requirement to manage the risks (Table 3.7). With this table, the community is able to see all of the necessary information to manage the risks such as what to do, how to do and who should be in charge.

In this step, the content analysis is employed to analyze transcript data.

Table 3.7 The Contingency Plan

Risk Ranking	Capital	Zone	Key Indicator	Action plan	Risk owner	Knowledge Requirement

3.4 Applying Systems Thinking Approach

The main objective of investigation is to propose a defensive protection system for Thai local traditional knowledge to manage and protect the community's traditional knowledge. Thus, a system approach is required. Systems Thinking provides ability to see the Mea-hiya traditional knowledge management in a holistic manner which is perfectly allied to IC approach (see Table 2.4, page 66). The Systems Thinking is applied as followed:

First, after investigating the eight steps process, the results should contain of the Mea-hiya community traditional knowledge management's strategies, KSFs, indicators, community capital forms, risk monitors index and contingency plan. These results must be analyzed and categorized into systems based on their characters. A holistic picture is structured to see the complex situations and to identify the interrelationships of the different systems involved in the Mea-hiya cultural management.

Second, the researcher arranges to use system archetypes (reinforcing and balancing loop) to present and explain each sub-system process. Each sub-system involves some parameters and their relationships which need to be analyzed so the community can encourage the learning process or solve problems in manner of holistic system. Cause of delay in each system is considered in the analysis also.

At this step, the research can present the Mea-hiya community traditional knowledge management in a holistic picture to understand its complex situations and interrelationships precisely.

3.5 Investigating IC Management in the Community

After the eight steps process is accomplished, the next plan is to investigate the community initial intellectual capital management actions to see what and how intellectual capital is managed by the community. The researcher constructs two tasks in this step.

First, the researcher plan to participate and observe a Mea-hiya community meetings and cultural activities. The researcher encourages knowledge creation process to the Mea-hiyas at a meeting. The Mea-hiyas should be activated to share their knowledge and experiences. The researcher observes the four modes of knowledge conversion (socialization, externalization, combination and internalization) within the Mea-hiyas to see how new knowledge and innovation ideas are created to manage and protect the community traditional knowledge. The proper share space (BA) is also promoted. In the meeting, Interacting Ba should be arranged. The right mix of people who have specific knowledge and capabilities in cultural domain can interact, share of anecdotes and stories, and recount daily experiences to each other and also reflect and analyze their own. This allows tacit knowledge to spread and converted into common terms and concepts.

Observation the community activity allows the researcher to see interaction between the Mea-hiya participants during perform an activity. Exercising Ba is occupied to facilitate the conversion of explicit knowledge to tacit knowledge. The Mea-hiyas can use information about the better practices and comparing it to their own performance. The internalization of knowledge is continuously enhanced by the use of knowledge in real life. The Mea-hiyas should learn through active participation in a cultural activity.

Second, the researcher creates the interview occasion to capture their knowledge of the interviewees. The interviews are organized as followed:

Agenda 1: introduce the objective of the interview.

Agenda 2: the interviewee expresses opinion on a cultural activity and its management.

The researcher arranges to record video tape and audio and take pictures of the cultural events in the community. The field notes are made. The content analysis and documentary research are employed to analyze the data. The results will be weighed in percentage term to show a certain area that contributes to creating wealth for the community cultural intellectual capital.

3.6 Result and Analysis

At this point, the research has been accomplished in applying the integrated eight steps process. The Mea-hiya community has cultural key stakeholders, receives the strategies, key success factors, indicators, and the community's intellectual capital. The community has identified major risks, evaluated the risks and created a plan to mitigate all risks.

To make this exploratory research completed, all the results must be analyzed and discussed to perfection step by step. The documentary research, the content analysis, the comparison analysis based on typology and the thematic extraction are employed intensively. All results must be analyzed with the intellectual capital and Knowledge Management approach, UNESSCO, WIPO and the sustainable development frameworks, and the Systems Thinking approach. The result and analysis are discussed in Chapter 4.

The research is analyzed and discussed in the Knowledge Management approach in terms of how the intellectual capital process encourages the knowledge in the community to be transferred and created and vice versa how the knowledge management process encourages the intellectual capital management. According to the research, in regards to the Mea-hiya community, the spiraling process of knowledge can be discussed in the SECI Model (Nonaka & Takeuchi, 1995) to see how the knowledge is actually managed in the community.

The research is analyzed and discussed in regards to the UNESSCO & WIPO frameworks in term of how the research designed process applied in the community corresponds to international framework and how the results provide an opportunity for the Mea-hiya community to manage traditional knowledge systematically and

practically.   The discussion will be related to the objectives of international organizations particularly UNESCO and WIPO which promote equal rights, conservation, protection, and exchange particularly through formal and non-formal education in order to promote understanding and respect of each culture (UNESCO 2003).

The research is analyzed and discussed with regards to the sustainable development approach in terms of how the results correspond to the sustainable development framework.   The discussion will be related to how the designed process promotes the objectives of sustainable development approach.

The research is analyzed and discussed with regards to the systems thinking approach in terms of how the traditional management can be explained and presented in a holistic perspective. Systems Thinking is a discipline for seeing the structure that underlines the complex situations and for discerning high from low leverage change. The essence of the discipline of systems thinking lies in a shift of mind seeing interrelationships of the systems (Senge, 1998).   The research can use its system archetypes (reinforcing and balancing loop) to present a defensive system of the Mea-hiya community in a holistic picture to see all sub-systems and their relationships. The community can encourage the learning process and/or also solve problems in manner of holistic approach.

3.7 Solution Development

The main objective of this research is to propose a defensive protection system for the Thai local traditional knowledge that will provide the local communities a prototype of self management and protection from the misuse and the misleading or loss of the community's traditional knowledge. In order to accomplish the objective, the research must design on a method based on three theoretical backgrounds - intellectual capital process, knowledge management process and risk management process.

The modification on the process model to fit into our specific situation in the Mea-hiya community is assembled complying with academic disciplines and practical approaches. The Mea-hiya community traditional knowledge management system which is complied with the objectives of Thailand National Sustainable Development, UNESCO and WIPO must be custom constructed as a prototype of a defensive system for the local Thai communities to manage traditional knowledge systematically and practically.

The system is arranged to present in form of Systems Thinking diagram. The research uses the systems thinking approach as a vehicle of presenting the whole picture of the defensive protection system that is conducted by this research. The research novelty and limitation will also be presented in this stage. Finally, the research will be concluded in Chapter 5.

3.8 Quality Control

To control the quality of the research, results from the process are summarized and present to the Mea-hiya community's stakeholders (see Appendix I). The stakeholders are then requested to verify and confirm the results to ensure the validity. Next, the results in each step is presented and questioned by the research supervisors and audients in the PhD conference. The results are also written as academic papers in order to submit and present in international conferences to verify the quality of the research.