

CHAPTER 2

LITERATURE REVIEWS

All sectors get involved in development efforts, Thailand are keen to have an appropriate learning model which is suitable to disseminate the Sufficiency Economy Philosophy (SEP) to farmers in Phitsanulok province, Thailand. A researcher would like to know how farmers learn to transfer knowledge and information to farmers so as to improve their quality of life. Thus, the purpose of this research is to explore and develop a learning model of SEP for the Thai farmers in Phitsanulok province, Thailand. The theory and related research documents were studied to understand farmers learning process context of learning of farmers and the dissemination of knowledge on SEP by farmer. This understanding will result in the decision making and application of production process and farmer way of life in Phitsanulok, Thailand.

The purpose of this chapter was to describe the theoretical framework for this study. To this end, journals, magazines, books, proceedings of conferences and, the Thai government documents were reviewed. Each chapter is divided as follows:

2.1 Learning Theory

2.2 Adult Learning Theory

2.3 Agricultural Learning Model

2.4 Sufficiency Economy Philosophy

2.5 A Learning Model on SEP

2.6 The Validation of Construction in Developing SEP Learning Model by Using Confirmatory Factor Analysis

2.1 Learning Theory

Chotchoung *et al.* (1983) said that learning is a process which induces behavioral change due to the past experience. In addition, Taewaruk (1997) said the behavioral change is a persisted behavior and Jamnong (1982) said learning will happen after the process is done which learning is the result of repeatable practices and is somehow noticeable when observed in performing task. And Saengsuwan (1989) mentioned that learning was the behavioral change results from observation, carefully considered and problem solving which may not be necessary change in the acceptable social way. The degree of learning depends on stimulus, perception, sense, experience, and knowledge background of the individuals. Therefore, life learning is to learn how to live happily in the world. One must learn how to develop inside natural power to be productive in such a way as power in physical ability, intelligence, emotion and society.

The scope of learning consists of two aspects. First, learning means learning process or the steps in the process or application of any methods in helping a person to be learned. Second, learning in outcome is the understanding in any substances, the ability to perform skill in any process including feeling and attitude results from learning process or learning methods. In other words, learning is output and which both are interrelated. If a person has understanding of any substance or process clearly

and deeply, and a feeling or attitude in a appropriate way and has changed in performance or behavior in a desirable way, learning process or learning methods and learning substance must always go together. (Kamenee *et al.*, 2002) The essential components of learning are shown in figure 2.1

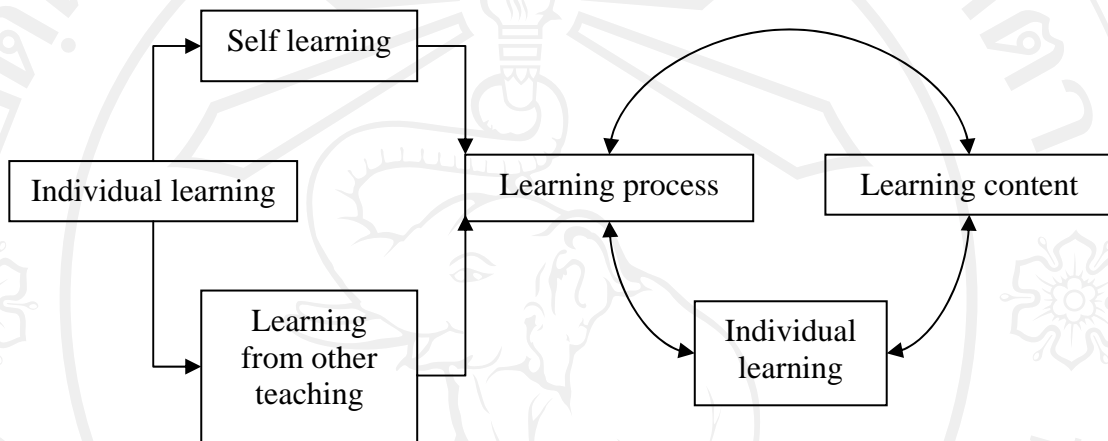


Figure 2.1 The Component of Learning (Kammanee *et al.*, 2002)

Learning consists of three interrelated components. Those are learning subject, learning process and learning outcome. Learning outcome consists of knowledge, understanding, skill and attitude about learning subject and process or learning methods. In summary, the learning outcome is the evaluation of learning process that the measurement is the methods in acquiring data of the degree of desired personal characteristics which could be transformed into measurable numerical or code that represented quantity of that characteristics (Kamenee *et al.*, 2002)

The general measurement of learning outcome includes:

The measurement of Cognitive Domain capability indicates the achievement of learning which could be used as a test that creates from the measuring subject as a tool.

The measurement of Psychomotor Domain capability indicates the capability of performing something which can be measured in various methods such as testing, observation, interview and work inspection and by using tools such as operating skill measurement form, test form, work inspection form and behavior observation form.

The measurement of Affective Domain is the measurement about feeling and emotion such as interesting, satisfaction, fearful including attitude and popularity which can be measured by behavioral observation, inquiry, interview, survey and by using tools such as attitude measure form, interesting measure form and popularity survey form.

The measurement of process skills is divided as follow:

- 1) The measurement of cognitive skills is the measure of thinking capability which is the invisible brain process. Nowadays, there are techniques and tools help in measuring this process such as judgment thinking process measurement form, creative thinking measurement form and investigation process measurement form

- 2) The measurement of Social Skills is the measure of capability in interaction with other peoples such as problem solving process, group process, conflict problem solving process, communication process and interaction between personal processes. The measurement tools includes test form, behavioral observation form, interview form and survey form (Kamenee *et al.*, 2002)

Therefore, learning means the behavior changing due to the components including the learning content, learning process and the output of learning which

could measure the learning output by the implementation evaluation and attitude of learner.

2.2 Adult Learning Theory

Farmers' learning is as adults learning which is learned by using experience and having clearly learning objectives. Adults learning differ from children learning in school such as children have an expectation in a not coming future. Adults learning theory has developed from the Andragogy concepts of Knowles (1974) which known as Adult Education. In adult education, Knowles (1974) has paid attention on the need in process management in order to learn and pay less attention on teaching such as learning by case study, self practice and self assessment which teacher should accept the role of facilitator more than teacher.

Knowles (1978) suggested that Androgogy was believed to be different from child learning as follows.

Change in self-concepts from reliance on others to be more on self – directedness and the appropriate learning should be self direction in learning.

Role of experience in adults are accumulated that was extend link to the new experience learning. The appropriate learning should extend from the past experience.

The readiness to learn is initially believed that when in stage of adults, the readiness to learn is the results of the biological development or less on body. On the other hands, the most of readiness to learn is the results from development tasks and

the development task is the capability that should be in human to response the social role.

The orientation to learning from the believe of the duration of learning utilization. Children look at the long learning in school as the fundamental for the higher education in the future, but most adult participate in learning activity to implement it actually in life.

Moreover, Knowles (1953) describes adults learning element that adults have clearly learning objectives in mind, the first step in learning is motivation creation of learning. Next step is to demonstrate the experiment in learning subject by emphasis on additional activities such as a demonstration field. The last step is to create satisfaction in adult learning experience. In addition, Watanawong (1981) said that the very important element in adults learning is the experience of adults which is very valuable and would help adults to utilize in learning. Cross (1981) said that the characteristic of adults in learning consists of self-independent and status of adults. In order to enhance knowledge of adults, the process in promote learning, include the adult context should be concerned. Rodkeow (2008) developed the ONIE manual that adults learning should be informal education by emphasis on learner is searching knowledge by oneself, but the education institute and related education person should provided and prepared learning resource in diversity of activity, up to date and develop the network of learning.

Adult learning consisted of important topics as follows: (Potisuwan (2005) quoted by Chaisopone (2008)

Adults aware that learning could respond their need and interest which mean when adults are stimulated to learning, this point is appropriated to begin the learning activity of adults

Adults' emphasis on learning to implement on their life (middle path of life), so the adults learning activity should be real life situation as the learning content.

The best learning resource of adults is experience.

Adults have the self directing needs.

The individual differences of adults increase according to age

Moreover, Tangjuang (2005) has summarized the learning processes as follows:

Behavioral learning begins from the instructor are defined an objective of learning and the effect of study management, and then finding the learning methods, suitable media for the content or local available resources. The teacher would put emphasis on media in learning process as to motivate the learner to take interest in the content in order to achieve the planned objective in each lesson and the overall objectives of learning is to change the behavior following the objectives.

Cognitive learning is described as the teacher understands the importance of the learner, examine the knowledge level of learner and put emphasis on the learner to understand the importance of the new knowledge to be learned. Then, encourage

the learner to participate in learning such as to search for knowledge, participate in class activity, use current situation along with lecture or learner participates in developing the learning media. By using this learning method, learner could self-solve the problem by using the deposit knowledge in adapting the problem solution when the situation is changed.

Humanist Learning is described as the learning process under the concept of humanist group. Humanist is focused on learner that is the most important by using the concept that the happiness of individual is not the same, so it is incapable to measure by using the others' criteria. This group of physiologist believed that human always change and need freedom in learning by not require any leading in goal setting. One would define his life because of maturity. Maslow has focused that one should rely on oneself which is according to the need of adults.

Moreover, Tangchuang (2005) stated that the capability of learning in Adults is not difference from other age but adults are specific and related to present implementation more than learning to prepare for the future. But for the limitation of learning methods which limited to specific area, the past learning method may not consisted of the appropriate thinking process. For the management of adult learning process, the study and understanding of the need of adult should be done.

Adults learning are experience learning that is self learning and continual learning. The scope of experience learning in theory and practice had an correlated aspects that the experience learning is the process of developing skill and attitude by integrated the past experience in order to develop new learning. Kolb and Fry (1975) quoted in Noiampang (2008) explained the experience learning that when adults learn

from experience in learning methods that they familiars and the learning start on this point but adults learn from multiple learning method which may not achieved the same result as the methods that they families. From the recommend of both theory, it was concluded that learning is a continuous cycle and the learning start from perception or implement learning activity that support all learning by some activity was the favorite and some are not interesting by the learner which shown in figure 2.2

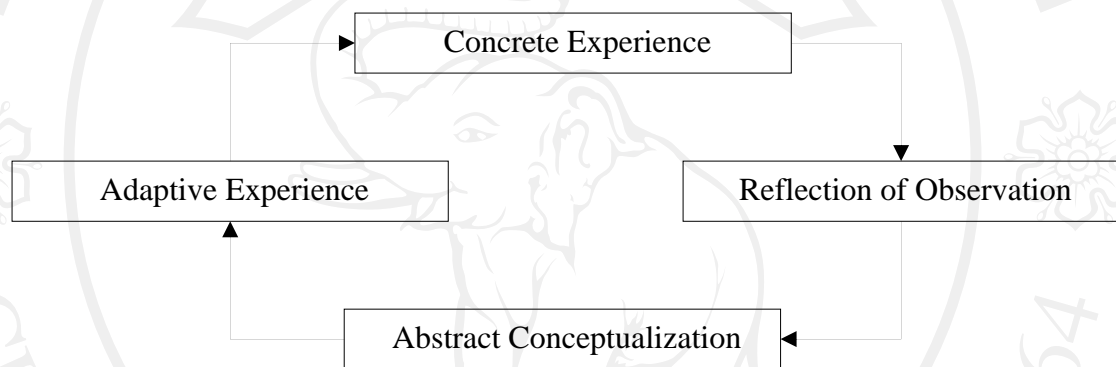


Figure 2.2 The Experiential Learning Cycle of Kolb and Fry (1975) quoted by Noiampang, S. (2008)

Figure 2.2 the learning activity move as a cycle on the arrow in the chart which the learning could begin from any point and follow the step in the given order to create the most efficient learning. Every steps of activity would interrelate at some time and the overall change happen when the learning cycle move continuously and every learner move toward their learning objectives. The efficient learner should learn from these learning steps.

Step 1 the concrete experience is experience learning from the feeling of leaner when implements activity.

Step 2 the observation and the opinion expression or the data on reflected observation are developed by the learning who observe the experience from the first step

Step 3 the concept determination to the abstract component and conclusion by the learner who integrated the experience from the vision and observation in step two to develop as a theory or rule of oneself.

Step 4 the implement of the output from learning in different situation that was use the conclusion in step 3 to experiment in different situation and apply what was learned in the different situation and continual this cycle in order to learn.

Noiampang (2008) explained the role of experience learner that the learning from experience is the learner central learning. The responsibility in learning is not from the teacher or experience learning arrangement. In this situation, the learner shall be active in learning and play role in participating in what and how to learn and learner should learn from the other in the way of discussion and response on the related experienced.

Knowles 1971, quoted by Koatbuntoaw (1982) said learning steps should divide into 4 steps as follows:

The first step is the step that the group of learner and the group of leader have participated in defining behavioral pattern, capability and the characteristics of learner need to perform according to the role such as the need characteristics to identify the good parents, good leaders, good farmers or good trainers. Watanawong (1981) also agreed that the most influence factor of self learning is social role. From many researches indicate that social role such as father, mother and couple help the

person who is in that role capable to learning and behave suitably which most person prepare oneself in learning this role quickly and capable of behave in this social role in good level.

The second step is to arrange experience in the course in order to help learner to explore their existing capability when comparing to the setting plan. The experience arrangement must utilize many techniques such as Sociodrama, real experience sharing, experimental method and situation simulation which can be used to enhance these experiences.

The third step is the leader help the learner to identify the unsatisfaction or gap between arrangement plan and the level of current capable knowledge.

The final step is the learner defines the working plan according to the development needed. So, the learner would learn from their motivation and responsible in finding the method of self learning.

Hiemstra (1996 cited in Sujanut, 2011) stated the meaning of self directed learning as follows.

1. Every learner had power to increase responsibility in decision making related to learning effort.
2. Learner can directed oneself in learning situation.
3. The self directed learning did not mean all learning was separately occurred.
4. The self directed learner could transfer both knowledge and learning skill from one situation to another

5. The self learning could be relevant to activity and learning resources such as self directed reading, the participation in study group or tutorial, training, conversation through electronics media and writing reflect thinking activity.

6. The important role of teacher was the conversation with learner, learning resource preparation, learning result assessment and the encouragement of consideration thinking.

7. Some academic institute was trying to find the methods in promote self learning by open learning program, individual study, open various subject and other new program.

Moreover, Guglielmino (cited in Sujanon 2011) stated that the one who could be self learning should had the characteristics as follows.

1. Capable of self learning initiating
2. Could self reliance
3. Be patient in learning
4. Have responsibility on learning of oneself
5. See the problems as a challenge, not an obstacle
6. Self discipline and high curious.
7. Have strong commitment to learn or change and self confidence.
8. Have basic skill in learning
9. Appropriate arrangement on learning time table and learning step and work development for achieving the success.
10. Happy in learning and having purpose in learning.

Therefore, appropriate learning model for adults should be an activity base on experience and self learning by exchange knowledge between learner and teacher and among learner continuously.

2.3 Agricultural Learning Model

The learning of farmers is considered as adults learning correlated with Nalampang (2000) stated that the knowledge extension and disseminate are teaching process which have strong relationship to learning process which is the teaching of target person or farmer to have good learning or the lecturer to utilize for the benefit of agriculture career. The learning process consist of activity in step that lead to the final step that is the learner are learn or behavior changing

Worth (2006) presented the Agriflection model that mentioned the component of learning process of farmer consists of Investigate (I): the search for knowledge and research, Assimilation (A): the absorption of knowledge, and Sharing (S): the distribution of knowledge. He also mentioned that Agriflection Model is the learning model which could eliminate the weakness of farmer in the aspect of financial, social, natural and physical. The Agriflection Model is the learning model of farmer in the context of South Africa which emphasize on 1) development of two kinds that are gradually improved development and continual emphasis development 2) equal balanced partnership that consist of person who is major responsible in extension which are enabler, service provider, and farmers. These persons are equal balanced partnership.

The important characteristics of the learning process in Agriflection Model is all enablers, service providers and farmers must have IAS as the main component in

all learning process and knowledge is derived from investigation, understand derived from assimilation and skill derived from sharing and service as figure 2.3

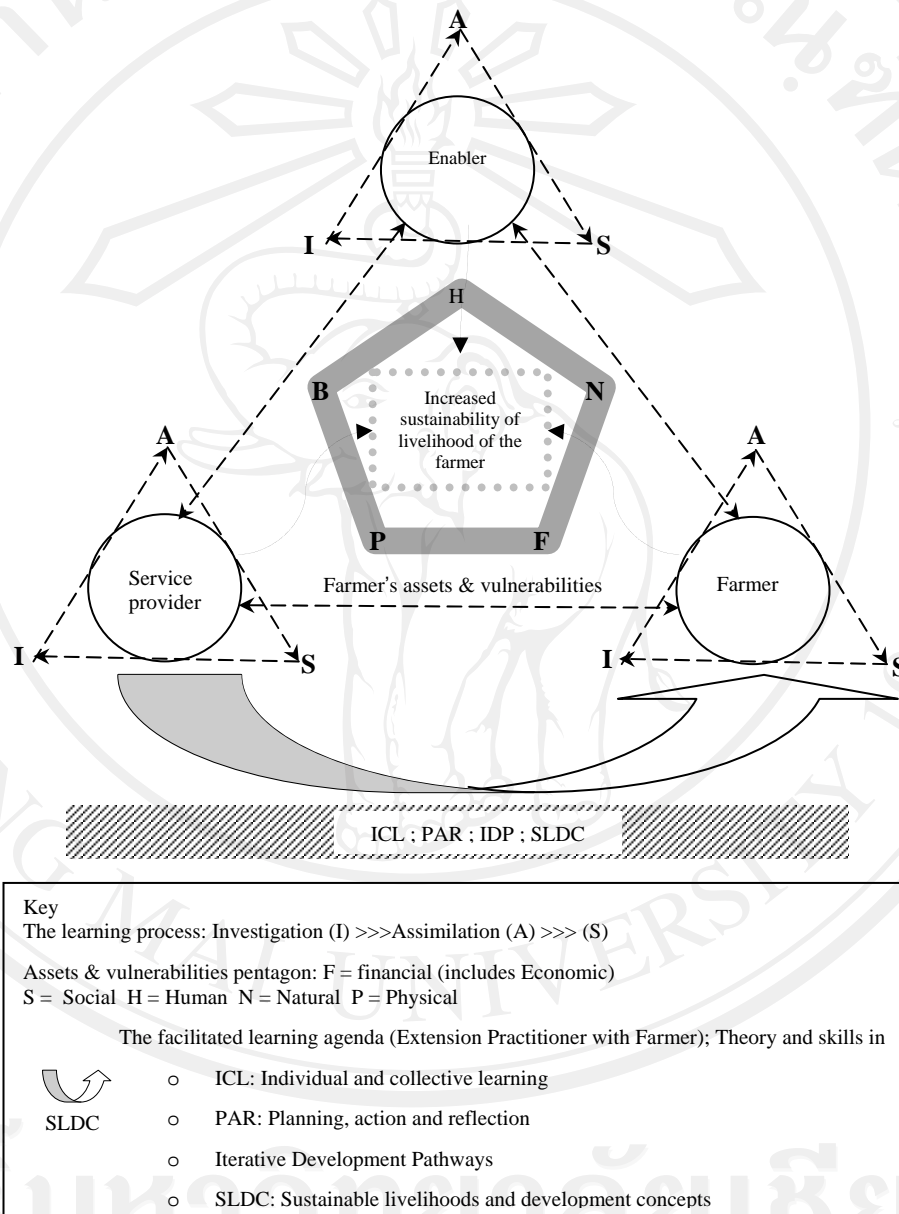


Figure 2.3 Agriflection Model (Worth, 2006)

Moreover, Agriflection Model mentioned the individual and collective learning that technology transfer did not have a role in this model because it was not about technology acceptance but emphasis on self learning and group learning by the

farmer was the important role in changing all the time and farmer also was an inventor and experimenter. In Agriflection Model, there was a facilitating learning agenda that consist of enabler and farmer working in supporting the farmer to be self learning and operating in group by planning, operating and having feedback from stakeholder and extension to be sustainable,

The factors in this learning model changes the previously culture from technology center to learning center and farmer perform the role of researcher and enabler by the farmer is the ownership of knowledge and enabler.

The job of the agricultural extension in this model was the helper and supporter to create the skill and share knowledge to farmer at the same time which was not technology transfer. The differences were changing from technology transfer to innovation learning and changing to operation from researcher to farmer.

The agricultural extension is the field manager who passes on knowledge and extension act like the instructor to help farmer in creating learning, change in living behavior and production. Dumrongkeit (1989) mentioned the meaning of agricultural extension that the farmer accept and employ the appropriate technology to improve economy, farmer society and family which the accepting process is the process of supporting farmer in learning. Rogers (1983) presented the model of acceptance for farmer in agricultural experimental station and it was found that the factors of acceptance consist of awareness, interest, implementation, trial and adoption. Moreover, prior to acceptance, there is an innovation decision process that consist of knowledge, persuasion, decision, implementation and confirmation.

Furthermore, Roger (1983) quoted by Dumrongkeitisak (1989) explained the influenced factor on Innovation acceptance consists of factor of learner, factor of transmitter and the characteristics of innovation that make farmers accept in the innovation. The characteristics of innovation that influence the acceptance are the relative advantage, compatibility, complexity, trial ability and observability. Moreover, Roger and Shoemaker (1971) quoted by Dumrongkeitisak (1989) that the innovation acceptance rates other than depended on the characteristics of learner, it is also depend on the diligent of passerger, the social characteristics and the appropriateness of the communication characteristics.

The characteristics of innovation also influence the acceptance of farmer which Rogers (2003) mentioned that there were many influential factors against the acceptance such as factors relating to receiver such as personality, characteristics of economy, social and need; factors relating to social such as the criterion of social and communication; the factor relating to transmitter such as reliability; and another important factor is the characteristics of innovation or the attitude of technology. The characteristics of innovation that influences the acceptance are:

1. Relative Advantage was the characteristics or benefit of innovation which was determined to be acceptable being better than old style. The relative advantage that accept by person had positive relationship to acceptance rate mean the more the person believe that innovation had dominant characteristics than old style, the more the acceptance would be.

2. Compatibility is the level of conformance between innovation and value, past experience and the perception of need by receiver which the level of

conformance in innovation according to the perception of member in social has positive relationship to acceptance rate. Dumrongkeitisak (1989) added that the more the characteristics of innovation conform to value, experience and need of farmer, the more the acceptable rate would be.

3. Complexity is the level of difficulty in understanding and attitude of person who employ innovation and this difficulty had a negative relationship to acceptance rate. The more person think innovation has difficulty, the lower the acceptance rate which the communication such as mass communication would help in promote simple technology. If the technology was complicated, the individual communication and the communication that produces an effect of confidence to receiver would be more suitable.

4. Trialability was the characteristics of innovation which user could try out in small scale and after the trial was accomplished, the more the acceptance and the confidence to operate in large scale. Some innovation could not be spitted in to small or large scale to try out, so the characteristics of capability in separated experiment according to perception of social member had positive relationship to acceptance rate.

5. Observability was the characteristics of results or return that was perceptible such as the demonstration of new rice species that farmer could clearly visible than the recommendation of boiling water for drinking because the explanation about the disease in water is not perceptible to farmer. The observation according to the perception of member in social has positive relationship to acceptance rate means

the innovation which person perception could clearly visible, the more the acceptance rate.

Therefore, the learning of farmer was not only the learning content and process of learning, but also the context of learner which is the important component for farmer because farmer has previous experience and value including the component and supporting factors such as the policy and extension worker which was an external component that help in extension and support in better learning.

2.4 Sufficiency Economy Philosophy

From the literature review in learning process and innovation dissemination which discussed earlier, it is essential to understand about the content of innovation of Sufficiency Economy Philosophy (SEP) which is needed by farmers in daily life.

His Majesty the King's sufficiency economy philosophy is one of the choices to be a guideline in developing Thailand as the philosophy was used as a guideline in the National Economic and Social Development Plan from issue 9 and also the present issue (issue 11). Wibulswasdi, Piboolsravut, & Pootrakool (2010) mentioned about his Majesty the King's sufficiency economy philosophy that the SEP suggest the guideline for the way of living of Thai people more than 30 years before the economic crisis in 1997 and afterwards his majesty has put emphasis on the guideline in solving this problem for surviving and capable of living in secure and sustainable under the globalization and other change.

For the past ten years, His Majesty the King's sufficiency economy philosophy has been intensively promoted in Thailand. The sufficiency economy is a philosophy that encourages people from every walk of life following the middle path.

Thus, sufficiency economy philosophy is one of the choices that can be used as guidance for developing the country. In addition, Sathirathai and Piboonsravut (2004) mentoring is the concept of His Majesty the King are emphasized “the way for recovery that will lead to a more resilient, balance and sustainable development, and to better able to meet the challenge arising from globalization and other change”

According to *The Nation Economic and Social Development Board (NESDB)* (1999) a definition of sufficiency economy philosophy from His King Majesty is as follows:

“Sufficiency Economy is a philosophy that stresses the middle path as an overriding principle for appropriate conduct by the populace at all levels. This applies to conduct starting from the level of the families, communities, as well as the level of nation in development and administration so as to modernize in line with the forces of globalization. “Sufficiency” means moderation, reasonableness, and the need of self-immunity mechanism for sufficient protection from impact arising from internal and external changes. To achieve this, an application of knowledge with due consideration and prudence is essential. In particular, great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fibre of the nation, so that everyone, particularly public officials, academia, businessmen at all levels, adhere first and foremost to the principle of honesty and integrity. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable to create balance and be able to cope appropriately with critical challenges arising from extensive and rapid socioeconomic, environmental, and cultural changes in the world.” (Unofficial transition. A working definition compiled from remarks made by His Majesty and King on various occasions and approved by His Majesty and sent by His Majesty’s Principle Private Secretary to the NESDB on November 29, 1999)

“ปรัชญาเศรษฐกิจพอเพียง เป็นปรัชญาที่ชี้ถึงแนวทางการดำรงอยู่และปฏิบัติของประชาชน ในทุกระดับ ตั้งแต่ระดับครอบครัว ระดับชุมชน จนถึงระดับรัฐทั้งในการพัฒนาและบริหาร ประเทศให้ดำเนินไปในทางสายกลาง โดยเฉพาะการพัฒนาเศรษฐกิจเพื่อให้ก้าวทันต่อ โลกยุคโลกาภิวัตน์ ความพอเพียง หมายถึง ความพอประมาณ ความมีเหตุผล รวมถึงความ จำเป็นที่จะต้องมีระบบภูมิคุ้มกันในตัวที่ดีพอสมควรต่อการมีผลกระทบใดๆ อันเกิดจากการ เปลี่ยนแปลงทั้งภายนอกและภายใน ทั้งนี้ จะต้องอาศัยความรอบรู้ ความรอบคอบ และความ ระมัดระวังอย่างยิ่งในการนำวิชาการต่างๆ มาใช้ในการวางแผนและการดำเนินการทุกขั้นตอน และขณะเดียวกันจะต้องเสริมสร้างพื้นฐานจิตใจของคนในชาติ โดยเฉพาะเจ้าหน้าที่ของรัฐ นักทฤษฎีและนักธุรกิจในทุกระดับ ให้มีสำนึก ในคุณธรรมซื่อสัตย์สุจริต และให้มีความรอบรู้

ที่เหมาะสมดำเนินชีวิตด้วยความอดทน ความเพียร มีสติปัญญาและความรอบคอบ เพื่อสมดุล และพร้อมต่อการรองรับเปลี่ยนแปลงอย่างรวดเร็วและกว้างขวางทั้งทางด้านวัตถุ สังคม สิ่งแวดล้อมและวัฒนธรรมจากโลกภายนอกได้เป็นอย่างดี”

From the stated meaning of SEP, Extension (2006 : Online) also stated that the principle and concept of SEP are the development based on the basis of middle path and precaution by considering the moderation, reasonableness, self immunity including by using knowledge, deliberation and moral in combination with the planning, decision making and execution. In addition to Senanarong (2004) refers that “the royal speeches given in 1974, it is obvious that His Majesty the King has placed importance on step by step development on the basis of self-reliance, have enough to live and to eat, moderation, reasonableness, and self - immunity. Also, His Majesty the King’s Royal statement significantly raised consciousness of Thai people to be prudent, to realize steps of development which are academically correct, and to adhere to moral to morals for every conduct of life.”

In implementing SEP as appropriate for every level of people, his majesty the king has recommended as follows:

The consistency on economical, decrease expense and wastefulness in living as his majesty the king said the living must not wastefulness and economical in appropriate way

The consistency on carry out an occupation properly and honestly, even in the state of deficiency in living as the speech of his majesty the king said the development of all person come from the good behavior and earn one’s living as a principle.

The abandon of benefit scramble and compete on business with aggressive fighting as the past. His majesty the king said the truly happiness mean the happiness and growth that acquired with justified in both intention and action, not from the chance or fighting with other.

Seeking for get free from difficulty continually by searching for knowledge to increase income to level of sufficiency is the essential target. A part of his majesty the king speech was clearly stated that the purpose of everyone who search for knowledge and build up oneself for security in order to live in progress, happy and having enough is the first level and next level is an honor of self support.

The practical in a good living and abandon all evil. His majesty the king suggested that “Try not to do evil as it will destroy yourself and other. Try to generate goodness for oneself, keep and increase doing goodness”. The concept of SEP will help recover the economical and social crisis of Thailand.

Department of Agricultural Extension (2003: online) explained the working definition of sufficiency into 3 characteristics as follows:

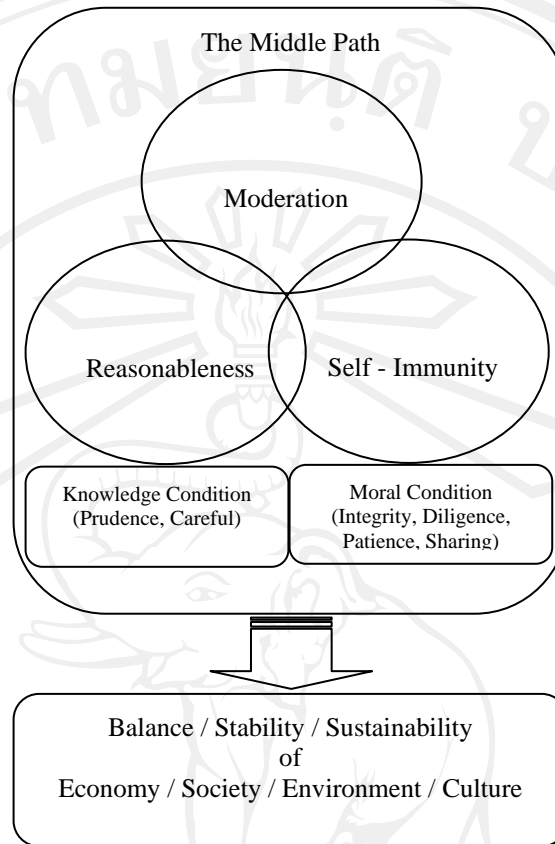


Figure 2.4 Summary of The SEP (Wibulwasdi, Piboolsravut, & Pootrakool, 2010)

Moderation means appropriately which is not too much and not too less in the dimension of action such as the production and consumption at moderate level that brings the balanced and prompt against the change.

Reasonableness means the decision about the level of moderation that should be reasonable by carefully considering the cause factor and the relevant data along with the expected results which could occur from those actions.

Self – immunity means the prompt preparation for the consequence and change in any aspect which would be occurred by considering the possibility of any situation that could be occurred in the sooner or later future.

Furthermore, Ayutthaya (2003) stated that aside from implementing according to the three characteristics of sufficiency, it is needed to employ knowledge, deliberation and precaution in adopting the available technology in planning and in every step of execution while strengthen the fundamental spirit to be aware of moral and faithful and have suitable knowledge, live with patient, diligence, intelligence and deliberation as the learning conditions as follows:

The Conditions of Sufficiency Action

A set of knowledge that bring about to implement the economic activity in moderate level which need

Knowledge is the stock of all relevant knowledge includes the content of any relevant subjects to be a fundamental for implementation in any opportunity and time frame.

Deliberation is the capability in connectivity of acquired knowledge and theory in associate with planning before applying in every implemented step.

Precaution is the awareness in utilization of implemented plan from any principle into application because in fact, the situation always changes. Therefore, the application of knowledge and deliberation Need to be employ carefully and keep up with the changing situation.

Ethics Qualification which have to be strengthen includes

Mental /wisdom by emphasis on moral knowledge that is aware of moral, faithful and suitable knowledge.

Behavior or way of live by emphasis on patient, diligence, intelligence and deliberation

Therefore, in order to be balanced and prompt against rapid and widely changes in social and economic, His Majesty suggested the implemented guideline on SEP which was called “A New Theory of Agriculture” for the farmers to be self supporting, live without difficulty, sufficiently living and be modest according to one's economic capacity, abstemious, behave appropriately and self supporting.

The concept of New Theory Agriculture consists of 3 principles as follows:

1. The first principle is the economic principle on self reliance by focus on producing vegetable production sufficiently for family need. Then, the leftovers from consuming will consider as a trade for production. The leftover production will be a profit of farmers. With this situation, farmers are the determinate person who was influence to market. The essential principle is the cost reduction by building the consumer goods in their own land such as rice, water, fish, fruit and vegetables.

2. The second principle is the community principle of villager. The villager organization is the one who carry out the economic activity with multi-activity of agricultural including diversify agriculture, hand crafting, trading and community tourism. When these villager organizations are developed to be strengthened and wide network, farmers in community will increase their income including the any problem will be solved. The overall economic of country will be grown stability with the better income distribution.

3. The third principle is the kindness, generosity and unity of member in community to help in carryout the activity to achieve the benefit which is not only

income but including the developing the stability of family, community organization, the ability in resource and environmental conservation, the developing of community learning process on folk wisdom and keeping tradition practice of Thai people sustainably. (Board, 2006)

Therefore, SEP in agriculture could be applied in daily life of farmers as appropriated because SEP is the principle in middle way lifestyle that carries out activities in moderation, appropriation and reasonableness of actions. By using this philosophy, each farmer could apply variety of agricultural methods depending on the location and farmers' experience by emphasis on moderate living, producing enough for consumption and then sharing or distributing the surplus to others, building self-immunity in living by operating diversity of activity in agriculture for natural balance and sustainability.

2.5 A Learning Model on SEP

This research study SEP learning of farmers on self reliance according to the first level of New Theory Agriculture in personal aspect. Department of Agricultural Extension (2000) conduct a first level of new theory agriculture about urban agriculture production base into disseminate by having the production in the characteristics of self sufficient and diversity of activity in farmland, supportively activity, utilization of family labor, reduction cost of production, increase earning and also integrate farmland activity to create benefit. Formerly, farmer cultivated for consuming by employing surrounding natural and crop diversity and mixture of plant including vegetable, fruit, tree, herbal and living plants in agro forestry type. These plants are ecology relationship that need differently and appropriate environment to

grow such as sunlight, temperature, humidity and soil. For example, small bush plants need not much light under big bush plants, a destruction of insect disease occurs to restrict the amount of some plant to be properly in the plant ecology system and mixed or variety of plant have ability to inhibit the infection of disease and other insects which bring the balance living capability.

The way of life in SEP for farmer level is the economy for agricultural emphasis on self-sufficiency of farmer in applying knowledge for managing land especially water resource and agricultural activity by adopting the first level of new theory which applied sufficiency production base in farmland and mostly utilized natural resource in order to diversify the agricultural activity in farmland to be supportively activity, increase earning activity, fully utilized family labor, reduction cost of production and also integrate cropping, husbandry and fishery in farmland to create maximum benefit.

The diversity in farmland is also important in agriculture according to SEP by employing multi-farm activity in the same area such as

Rice is the main food for Thai people for consumption in the family.

Pond is the water source in farmland and raise animals

Vegetable for household consuming, reducing daily expense

Herbal is food and folk medicine.

Tree and timber is firewood building and wickerwork.

Animal husbandry is protein source of food and increase income

Flower and ornamental plants are beauty, recreation and increase income

Fertilizer is soil nourishment for maintaining a balance of nature and environment

Moreover, the diversity of activity in farmland is also supportively activity in some aspects such as

Fishery in rice field which the byproduct of rice is the food of fish and the fish eat the rice pest, besides the feces of fish is fertilizer for rice.

Vegetable cultivation and chicken feeding which chicken eat vegetable scraps and chicken feces are fertilizer for vegetable.

The utilization of resources in farmland such as animal feces are manure, the scraps of leaves and grass are fertilizer, the scrap of vegetable are fish food and rice straw use in mushroom culture, manure, moisture soil and food for animal

Therefore the SEP application of his majesty for adopting as a guideline for implementing agricultural activity of farmer could be done reasonably and supportively balance without relying on irrelevant factors which results in self immunity and self sufficient. Earn of living employing SEP could be done as follows:

Mixed and variety of agriculture is the beginning of SEP.

Vegetable cultivation for reducing the expense of food in family

Using manure and fertilizer with chemical fertilizer for reducing the expense and soil improvement

Growing mushroom in rice straw and scrap materials in rice field

Growing fruit and tree in the backyard

Growing herbal for improving health and sanitation

Fishery in garden plot, rice field and pond for protein food and increase earning.

Feeding native chicken and egg chicken around 10 -15 for food in family by using paddy and rice bran from rice farm. Corn for animal feeding from agricultural plants and scrap vegetable from vegetable cultivation.

Biogas from feces of cow or pig for making fuel in household.

Extracted biochemical from vegetable scrap and herbal for using in farmland.

Moreover the SEP way of life is to earn a living on the available resources by using knowledge and capability in order to be sufficient in moderation characteristics that results in well-being of family. The surplus from living could be sold for earning and reserve for future. Therefore SEP is the way of living in moderate way based on the self dependence as follows:

Mental aspect by being self dependence, positive consciousness, self and overall nation creation, generosity mind, compromise and consideration based on the common interest

Social and community aspects by helping each other and create vigorously social network.

Natural resource and environmental aspect by intelligence production management, acknowledgement value of natural resource and environment, and based on conservation and sustainable utilization.

Technology aspect by utilization of available and modern technology properly and conform to the need and environment, application of intelligence of locality and development of technology from self learning.

Economy aspect by increase earning, expense reduction and reserve for capital.

The developing of correctly understanding of SEP to application need to develop the intensive learning process. The effective learning process should be done in appropriate steps and learning methods which will be a mechanism in changing world's perspective, paradigm, and value of production method, thinking method and way of living on Thai farmers.

The exploring of SEP learning model for farmers from review literature found that the component and factors of SEP learning model are gathered from adults learning theory and link with the SEP learning of farmers which is the experience learning and continual learning. The SEP learning model of farmers consist of 5 essential components that are the context and background of farmer, the content of SEP, learning process, component and supporting factors and the output of SEP learning in both practical and attitude. There are interrelated factors as follows:

The context and background of farmers that apply SEP in agricultural. The background of farmers means the experience of farmers, the economic and social status, the attitude of farmer that is the internal component of farmers according to the concept of Roger (1986) quoted by Watnawong, (2004) that had influence on SEP learning in the aspect of the acceptable in order to implement SEP as a way of life and in agricultural. Charoenrath (2000) suggested that the most important condition for

SEP to emerge, maintain and adapt are the community had authority to control and look after their resources by using their culture, believe, tradition or ceremony which is the context and background of farmer as the system of their own village. Moreover, Wongwasan (1999) stated that the economic and social condition from internal and external the village had effected on the learning model and thinking system of agricultural career.

The content of SEP mean the moderation, the reasonableness and self immunity under the condition of knowledge and ethics that could be measured from the understanding of SEP content that influenced the SEP learning in both practical and attitude. The factors of content in learning SEP as Rogers (2003) stated that the influence of learning of farmers are relative advantage, compatibility, complexity, trialability and observability of SEP content. As Iamcheum (2005) stated that the factors that influenced the innovation acceptance are the difficulty in understanding technology, the implementation is not complicated and the return is worthwhile

The learning process of SEP is learning by experience (Kolb and fry (1975) quoted in Noiampang (2008)) and self learning by farmer who is the dynamic learner. Worth (2006) presented that the learning process of farmers is farmer learning transform themselves from knowledge receiver into self learning and cooperate learning with other facilitators and policy makers. This learning consists of three components, namely self continually investigator to develop the knowledge in order to create truly knowledge, knowledge assimilation to apply knowledge in order to understand the activity and knowledge sharing to create skill in order to encourage the sustainability by self and group learning that indicate the corporation.

The component and supporting factor in learning SEP which are the external factors influenced the SEP learning results of farmers such as the policy, the agency, the extension officer, mass communication and budget. These factors support farmers in better learning SEP. As Charoenrath (2000) suggested that the government play an important role in supporting community and could support and develop the capability of farmers by determine the policy that enable the deployment of authority from central at the same time of helping the community to develop their strength by themselves by develop the multiple learning process. Moreover, Wongwasan (1999) stated that farmers learn about their career from the extra sources including agricultural documentation from the government officer, public documentation, village announcement and mass communication such as television, radio and news paper.

The learning output of SEP in both application and attitude. Wongsawan(1999) summarized that learning model have relationship with professional systematic thinking by the nature of learning in 3 aspects that are knowledge, skill and attitude. These relationships also relate to the agricultural production methods because the output of learning creates the decision thinking system in appropriate application for farmers living. The output of SEP learning is measured by using the learning result on SEP of the new agricultural theory level 1 in the topic of individual sufficient that consist of the learning output on practical and attitude to be good, intelligence and happy persons. Kaewaurai *et al.* (2003) explained the required characteristics according to National Education Act (1999) as follows.

A good man was the one who living with quality of life, kind emotion, morale, ethics and had the required characteristics in both mind and behavior such as discipline, generousness, reasonableness, responsibility, honesty, diligent, economical, democracy mind, respect to other opinion and right, sacrifice, environment conservation and peacefully stay with other.

An intellect man was the one who was high performance in living that had ability in one aspect or all-around or special talent such as skill and science process, ability in mathamatics, creative thinking, ability in language, art, musical, sport, leadership, known oneself, self controllable. He was also contemporary, up to date, modernize, catch up with technology, Thainess, capable of self developing potential and make benefit to oneself, community and country.

A happy man was the one who was healthy in both physical and mental, joyful, wellness, decisively mind, good human relation, love in everything, freedom from all vices and living in sufficient circumstance.

The study of components and factors of this learning model would be the guideline in promote the learning in the present national economic and social developing plan that need to be study in the influence factors on SEP learning of farmers on the basis of Thai farmers community context by promote the knowledge for farmer to change the production and behavior in living to be more appropriated.

2.6 The Validation of Construction in Developing SEP Learning Model by Using Confirmatory Factor Analysis

From the stated conceptual framework in theory and additional factors explore in the area has led to construct validity by using confirmatory factor analysis model as follows:

Wiruchai (1994) quoted by Kaewaurai *et al.* (2003) have concluded that Model LISREL indicated that the integration of data analysis methods are the result from three data synthesis that are factor analysis, path analysis and the parameter approximation in regression analysis. The model analyzes the principle of LISREL are the analysis to examine the conformity between LISREL model which is research hypothesis and the empirical data by comparison of variation/co-variation matrix from the empirical data with the approximation parameter matrix from research model calculation. The linearity of structure or construct validity means the characteristic of measurement meter that gives a result of measurement conform to a measurement characteristics which define by using structure variable in the linearity of structural theory as a most important linear because it is an associate linear of practical measurement and the characteristic of measurement in theory. In other words, the linearity of structure is an important characteristic of measurement meter which indicates the quality of measurement meter that could be measured conformity between the required characteristics and the structural theory.

Kaewaurai *et al.* (2003) reported that the examination on linearity of structure could be done by both traditional Correlation Matrix and Linear Structural Relationship Model or LISREL model that developed to improve the weakness of the

traditional method to examine the relationship between observed variable and the needed characteristics to measure. The Confirmatory factor analysis (CFA) is the most popular and widely used. Millsap (1995) mentioned in *et al.* (2003). The CFA that was developed by Joreskog is the suitable method for analysis data and CFA model is the sub-model of LISREL model which is utilized in examining the linearity of structure by determining the latent variable or multi-characteristics factors needed to measurement which the needed measurement characteristics and measurement methods are independent.

There are three objectives of using CFA as follows: firstly, the researcher uses CFA technique for examining the basic theory in fundamental factors analysis, secondly, to explore and define factors and finally, to use as a tool in developing new variables and can be used to analyze data as well (Kaewaurai *et al.* 2003)

There are four steps of using CFA to factors analysis are the preparation of correlation matrix, the extraction of the Initial Factors, the Method of Rotation and the developing of composite variable. As Kaewaurai *et al.* (2003) have summarized these steps as follows:

1. The preparation of correlation matrix

There are two types of correlation matrix are R- type and Q-type. The R-type correlation matrix means the matrix of coefficient correlation between each pair of variables and scoring unit to calculate the correlation value of each pair are the number of sample unit. The Q-type correlation matrix means the matrix of coefficient correlation between each pair of sample unit and scoring unit to calculate the correlation value of each pair are the number of variables or a characteristic of each

sample units. The factors analysis in a research generally used the R-type correlation matrix data to study latent variable that indicate as observed variable but factors analysis should employ R-type and Q-type matrix to conformance the analyze result. The Q-type matrix factors analysis indicate the aggregation of the same characteristic of people and the correlation matrix prepared by the researcher for analyzing the factors should have correlation value different from zero. If the variables do not have any relationship means there is no cooperated factors and it is useless to analyze those correlation matrix in SPSS and the result of hypothesis testing indicate that those correlation matrix are identity matrix. The correlation matrix analysis could also use bartlett's test of sphericity which is chi-square testing of correlation matrix determinate. Norusis (1988: B-44, Quoted by Kaewaurai *et al.* 2003)

Moreover, there are also SPSS testing by statistic calculation called Kaiser-Meyer-Olkin measure of sampling adequacy which is the index of different between observed variables in correlation matrix and anti-image correlation matrix that is Partial Correlation matrix between each variable. When the variation of other variables are eliminated, the index value of Kaiser-Meyer-Olkin should be close to one and if the index value is low, the correlation between variables is also low and it is not recommended to analyze the factors.

2. The Extraction of the Initial Factors

The objectives of the Extraction of the Initial Factors is to separate common factors and reduce the number of factors to be minimal as possible in order to weight

the factors in calculating a correlation matrix value to be close to a correlation matrix of observed variable which is empirical data. In the process of factors extraction, a computer is repetitively calculated from the setting hypothesis of one factor and use matrix factor to calculate correlation matrix value comparing with empirical data matrix. If there is numerous different, the hypothesis of two factors would be generated and carried out an analyzed process until a correlation matrix value is closed to empirical data matrix.

3. Method of Rotation

The rotation methods technique in analyzing factors was developed by L.L.Thurstone in 1974. This technique use the rotation of references axis which is the represent axis of factor rotate through coordinate point of variables as much as possible. There are three types in rotation of references axis method to group the variables in factors that are the rotation of axis by using graph, the rotation of axis by using the define criteria analysis and the rotation of axis by factors matrix conform to define target matrix

4. The development of Composite variable or Factor scale

In developing composite variable or factor scale, the number of factors to be used must be determined first. Then, the three subjects to be defined before developing the factor scale are indeterminacy of factor scale, the accuracy of factor scale and the variation of sampling. Kim and Mueller (1987: 61-67 Quoted by Kaewaurai *et al.* 2003) explained that these three subjects are interrelated and must be determined in developing factor scale as follows

Undefined part of factor scale. The initial agreement of analysis in significant factors is the agreement in causal analysis of factors that the observed variable is fluctuated due to the common factor (F) and specific factor (U). Therefore, common factor should occur from the common variation of observed variable which is not including specific factor. However, in building factor scale (F scales) from observed variable, factor scale was developed from linear positive value of observed variable, therefore factor scale has some parts that are common variation of observed variable and some part of specific factor. In other word, factor scale always has undefined part or specific factor part of observed variable.

The accuracy of factor scale. Due to there are undefined parts or specific factors in factor scale as stated previously, the variation of factor scale and common factor are inequality. The common variable part is occurred from the common variation of observed variable and by squaring this variable, the result is the accuracy of factor scale. The factor scale was calculated from linear summation of observed variable, therefore the high weight factor of observed variable is significant for the accuracy of factor scale. The less amount of observed variable from developed scale factor with high weight factor is better than the large amount of observed variable from developed scale factor with low weight factor. Therefore the accuracy of scale factor depends on the weight factor of observed variable

The deviation of sampling. In general research, a researcher analyzes a sampling data and refers the result to the population. The sampling selection in the research could have a deviation from sampling, therefore even if the factor model conform to the population data but it may not conform to the sampling data. A

researcher must develop a criteria for creating factor scale as close as possible to a common factor that expect to be a correct factor model and this criteria was developed differently according to the characteristics of building factor scale method.

The accuracy testing of a model

Wirutchai (1994, Quoted by Kaewaurai *et al.* 2003) summarized that the conformation testing of the developed model from theory with empirical data by using data analysis from sampling, parameter approximation with LISREL program, Maximum Likelihood method in pattern that using as a conceptual framework in research. The result of analysis would be presented in the relationship of parameter analysis, statistics value in testing the conformance of research model and empirical data using statistic value in measuring good of fitness. The values of a model accuracy testing are Chi – Square, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) and Root of Mean Square Residuals (RMR).

Therefore the analysis by using LISREL program would use one of these indexes in determining the conformance of research model with the empirical data as follows: (Wirutchai, 1995 Quoted by Kaewaurai *et al.* 2003)

1. The statistical value to measure a goodness of fit index are:

- 1.1 Chi-Square Statistic. If Chi-Square Statistic value is high means conformance function is difference from zero significantly in statistical. This means LISREL model does not conform to the empirical data. If Chi-Square Statistic value is low, the more the value closes to zero, the more the conformance of the model to empirical data. Moreover, Saris and Stronkhorst (1984:200) quoted in

Kaewurai, *et al.* (2003) suggested that the model fit with the empirical data, the Chi square value should close to degree of freedom.

1.2 Goodness of fit Index would be value between 0 and 1. The GIF index that approach 1.00 means the model conform to empirical data.

1.3 Adjusted Goodness of Fit Index (AGFI). This index has the same characteristics as GFI.

1.4 Root of Mean Square Residuals (RMR) index. The RMR index that approach 1.00 means the model fit to empirical data.

2. The evaluation of measured model, Unsuchote *et al.* (2009) summarized that the evaluation of measured model is to monitor the observed variable, latent variable by determine both validity and reliability.

2.1 The validity is determined by the factor loading and has a statistical significant value of t-value more than 1.96 and statistical significant value of 0.05, t-value more than 2.54 and statistical significant value of 0.01. Diamantopoulos and Siguaw (2000) quoted by Unsuchote *et al.* (2009). By comparing the weight of standard loading, the very important variable will have the weight of standard component very high.

2.2 The reliability are determined in square multiple correlation (R^2) and a part of variation of observed variable by latent variable.