CHAPTER II

LITERATURE REVIEW

The researcher has reviewed and compiled data from academic documents, books and research projects relating to this study. The following topics will be presented in numerical order with details:

2.1 The problem solving approach

2.2 Empowerment

2.3 Participatory Research

2.4 Community based research

2.5 Factors relating to waste disposal

2.6 Previous Waste Disposal Projects for Riverside Communities

## 2.1 The Problem Solving Approach

The ability to solve the problem is essential if individuals are to live, work, and function effectively in our current and changing society. A community problem exists when a considerable number of people identify a condition that must be changed. Obviously, the problem has to have some basis in reality (Ralp & Brody, 1982). This is the reason that facts about the situation must be gathered, although different people (and experts) may argue about how to interpret these facts.

Problem Solving Procedures by Community

It is found from the literature review that group participation in solving community problems tend to become much more effective when the community members themselves are the ones affected by the problem So, to study the problem-solving process within a community, we need to focus on the community organization and the researcher has decided to select problem-solving process in community level as a means for this study.

This study emphasizes at problem solving through the cooperation of the people in the community either by having all members of a community organization or its representatives to participate in the problem solving process. This study will consider several issues, which can affect the problem solving process including the sharing of common interests toward a problem in the community. Sriwilas (1996) defines social problems as "unpleasant situations which affects a group of people and people feel they must be solved by cooperation". Therefore, the members of the community must together agree on the seriousness of the pending problem before any significant effort or initiative can be made jointly to address the issue.

Francis (1981, p. 1-3) categorizes the process of problem solving into eight levels as shown in the figure 2.1 The diagram is simply presented in levels to make it easier to understand but in reality, all these steps may be combined and highly interconnected as if they belonged in the same box or happened almost at the same time
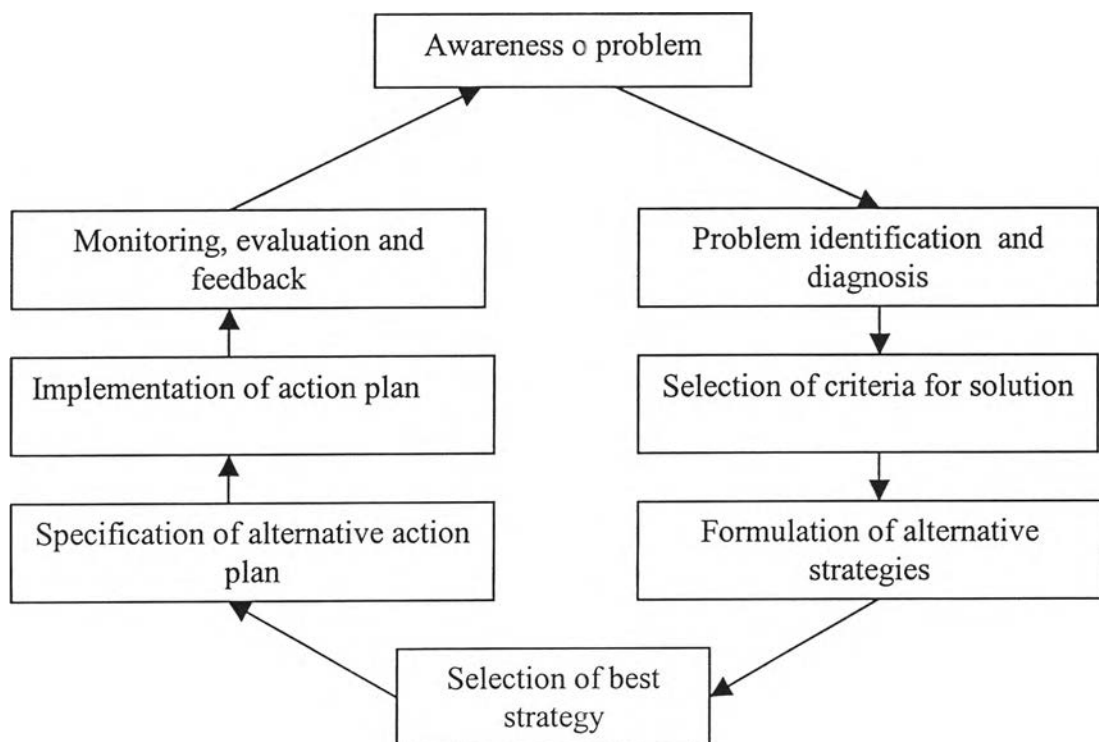
Figure 2.1: Basic Steps of Problem Solving

A problem becomes a community problem when individual discontent becomes a broadly felt concern. To begin to deal more effectively with a community problem, people should understand the process by which it becomes a community problem, the background of the problem, and theoretical perspectives to the problem. Because poorly thought-out statements set the stage for poor solutions, community people must resist the tendency to spend too little effort on defining and understanding problems in their eagerness to seek answers. The researcher realized that the best approach to solve the problems is to make use of the philosophy embedded in the Buddhist doctrine which looks at the root cause of things happening in nature.

"Buddhism is a religion of wisdom" and that the Buddhist doctrine is a heritage of wisdom which is practical for today's complicated world (Virutsetazin, 1999). It is a perfect system and covers many western theories. It is a holistic view and compliments our daily life. It is not exclusive for any particular person, but it is open to every level of the community. Buddhism is closely associated with Thai traditional values and cultural activities. The Thai traits of generosity and friendliness are often cited.

This study raises the Buddhist doctrine to be the advocacy for problem solving. It is being able to look at things with critical eyes and break them down into their basic elements. Therefore, in the process of problem solving, critical reflection plays a primary role; it eradicates ignorance and other defilement. Critical reflection helps develop the ability to think and culminates into a highly developed level of wisdom. The developed thought must be structured, reasoned and in harmony with causes and conditions, therefore, it fits for problem solving.

This study takes the thinking process in light of the Four Noble Truths (Ariya-Sacca). This way of thought is based upon observing the problems or phenomena and focusing upon their causes with the intention to find a solution. Wherever the cause of the problem is found, we can begin to solve the problem by attempting to eradicate the roots of the problems.

Problem solving by the Four Noble Truths (Ariya-sacca)

The Four Noble Truths (Ariya-sacca): the Highest Acquisition of Mankind, is the Dhamma realized by Buddha upon His Great Enlightenment. In reality, there is only "One Truth". This Truth is the Ultimate Truth: no one can dispute this Truth for it is the Truth of Nature. There are many ways to solve the problem but this study will look at the problem solving according to Ariya-sacca which is the cause and affects thinking process.

The main motivation in applying Buddhist teachings in community problem solving lies in the fact that the communities under study are predominantly devout Buddhists and therefore are most amenable to practices and methodologies that have roots from the religion. Buddhism intertwines very closely with their culture and the way people lead their daily lives, religious ceremonies performed on various occasions tend to not only reflect religion itself but the local culture as well as the festivities and the coming together of the villagers themselves.

In Thailand, Buddhism has influences over Thai people in their daily lives. Thai people usually follow Buddhism for the problem solving. In the Buddhist context, various methods of systematic reflection are given (Virutsetazin,1999) including the method of "how to think". One must engage the mind and consider matters thoroughly in an orderly and logical manner through application of critical and systematic reflection.

a) The Noble Truth of suffering (Dukkha): The first truth appears throughout our lives in the form of sorrows, dissatisfaction and frustrations. These phenomena are common to all people; they do not discriminate. In the process, suffering itself is not the thing of which we must rid ourselves because suffering is not the cause of suffering. Rather, suffering is the product of craving and desire. Buddha taught that we must observe, locate and thoroughly comprehend our sufferings.

b) The Noble Truth of the cause of suffering (Samudaya): This Truth states the cause of suffering. Each phenomenon in our life has conditions

through which it arises. People are surprised with extraordinary things when they do not know the conditions. On the contrary, when we know this, we will not be surprised by strange phenomena. Buddha encourages us to eliminate all kinds of causes. We have to prevent suffering from arising or protect the mind from suffering by giving up any actions that lead to suffering.

c) The Noble Truth of the state of no-suffering (Nirodha): This Truth represents the state of no-suffering, which is the goal of human beings. It is a state of mind where ignorance and craving are replaced by wisdom and compassion. It is the realization of the state of perfect peace, the absence of defilement and the freedom from suffering. It serves as a warning of hope toward which we should strive and finally reach. When this truth is realized through the practice in the right way, we will then attain complete protection from the arising of suffering.

d) The Noble Truth of the way of practice (Magga): This truth represents the way leading to the extinction of suffering, maintaining the mind in the state of no suffering. Buddha outlined the Noble Eightfold Path to help people realize the state of no suffering and guide them in the right way. This way of practice is practical and convenient for everyone at any time and in any place.

The Four Noble Truths can be applied in the community problem process as follows:

1. Study and identify problems (true sufferings)
2. Seek out causes of the problems (true origins)
3. Gather information on the causes of the problems (true origins)
4. Check the possibility of the causes of the problems (true cessations)
5. Draw a conclusion of the real causes (true paths)

The Four Noble Truths is a Buddhist teaching aiming to instruct people to be reasonable and think logically before taking actions. The researcher believes that the Four Noble Truths is most appropriate for problem solving in the community because

of its systematic means and its simple steps which can enlighten Buddhists to use reasons to examine outcomes/results.

The community can apply the Four Noble Truths to analyze personal and social problems and to identify the problems, the causes of the problems, the various options for solving the problems and to decide which way and how to solve these problems. To make the right decision, people must consider information from all aspects including their mind, the effects to the local majority, to the society at large as well as to the environment and then search for knowledge to solve these problems.

Virutsetazin (1999) describes two approaches for problem solving; Four Noble Truths approach and the scientific approach. Both are intellectual approaches and presented below in table 2.1 for comparison.

Table 2.1 :   The Two Approaches for Problem Solving

Four Noble Truths Approach for Problem Solving	Scientific Approach for Problem Solving
1. True Sufferings (Dukha): Study and identify problems (what, where, etc.).	1. Location of Problems.
2. True Origins (Samudara): Seek out causes of the problems.	
3. True Cessations (Nirodha): Present a process how to be free from sufferings and show that problems can be solved.	2. Setting up of Hypothesis.
4. True Paths are divided into three levels (Magga) First Level: Search for evidences /experiments	3. Experimentation and Gathering of Data
- Second Level: Check, screen, select and gather practical information.	4. Analysis of Data
- Third Level: Take off errors and leave only true paths which lead to solutions of the problems.	5. Conclusion

Conclusion

1. Dukkha (Sufferings)

Identify problems and the need to understand them and be able to draw boundaries of the problem (Prinya).

2. Samudaya (Origins)

Analyze and diagnose causes of the problems which will be corrected and eliminated (Pahana).

3. Nirodha (Cessations)

Indicate a suffering-free condition which shows that problems can be solved and the way we can reach that goal and proceed towards it (Satchikiriya)

4. Magga (Paths)

Define approaches, process and details of actions to be taken to solve problems.

The use of Ariya-sacca for the problem solving is appropriate for all Buddhists because they can apply the Buddhist doctrines in dealing with their problems in daily life. The combination of the application of Ariya-sacca together with another Buddhist teaching called The Right Understanding **(samma-ditthi)** should be even more appropriate for the Thai culture and more consistent with the Thai lifestyle than any other existing theories in existence today.

From this realization, we come to understand that our lives are led by wisdom because The Right Understanding is wisdom. Thus, everyone should realize the importance of wisdom in their lives. The problem solving according to Ariya-sacca allows us to realize the condition of suffering and the cause of suffering. Applying systematic problem solving approach is a principle to look back to the root or cause of problems based upon wisdom and intellectuality.

The Right Understanding (samma-ditthi)

The Right Understanding (samma-ditthi) comes from wisdom. Wisdom means knowing in every aspect and knowing how to solve a problem. The difference between human being and animal is the capability of being "conscientious and knowing". Human beings have wisdom and ignorance, while animals have only instinct. Human beings, therefore, have choices. They may act with either wisdom or ignorance while animals do not have these choices.

The Right Understanding is a valuable asset in resolving problems associated with the body and mind. It is needed to efficiently and effectively carry out one's daily activities and responsibilities. It is also misleading to believe that problems arise because one's physical imperfections. (Virutsetazin, 1999)

Buddhism categorized wisdom into three types: (1) wisdom realized by hearing or reading (Suta-maya-pannas), (2) wisdom realized by thinking, reflection or contemplation (Cinta-maya-panna) and (3) wisdom realized by practice or experience (Bhavana-maya-panna). With the first two types of wisdoms, only mindfulness is achieved. This only will not prevent suffering from arising. However, once realizing the third wisdom by practice or experience, can one then solve all human problems.

One must come to know and fully realize the essential duties for a perfect life. One must realize what the condition of the problem is and comprehend it. One must realize the cause of the problem and eradicate or eliminate it by letting go of some actions. One must understand the state of no suffering and the way to maintain the state of no suffering and to develop the right way to guide their practice.

Problem solving through The Right Understanding is indeed the approach of scholars. The strength of The Right Understanding is to make use of wisdom to figure out for solutions. This is the means to find out the cause of problem and its consequence by the wisdom. People can improve their wisdom through observation, training and learning. Wisdom has the power to improve situations and make things better. The Right Understanding helps people to be aware of the truth, to learn, to

understand and to realize the cause and effect based upon the Four Noble Truth or Ariya-sacca. As a result, they will clearly understand what factors cause the problem and what solutions to take to cope with problems. Ariya-sacca consists of suffering, the cause of suffering, the state of no-suffering, the way to the extinction of suffering. The suffering is the problem which is important as it leads to other truths. Next we will try to search for the cause of the suffering or the problem. When the cause is found, the means to tackle the problem is needed and once the problem is resolved, we will find true happiness.

In real life, individuals learn from problem solving and try to tackle problems for their own survival in society. They can use the Four Noble Truths to solve problems until they are enlightened and fully and thoroughly understand the problems.

2.1.2   The "Samliam Kayern Pookuo " approach.

According to Dr. Pravej Vasee's (2541) perspective, when conventional means cannot solve a big complicated problem, a theory referred to as "Samliam Kayuen PooKuo" (Triangle that moves the mountain) can be applied. (Ministry of Public Health, 1999). The theory consists of three main components, which are (1) knowledge creation, (2) social movement and (3) political linkage. When these three components are adequately addressed, the resultant will be a very effective tool for solving major contending issues and social problems
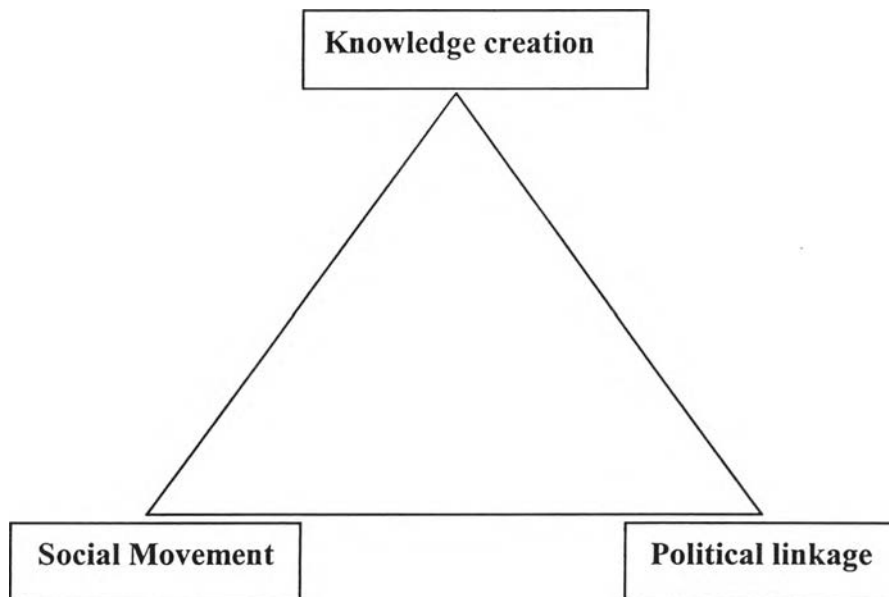
Figure 2.2 : The relationship of three components depicted as a triangle

This concept exemplifies the need for knowledge creation, social movement and political linkage in solving complex social problems at the community level. Knowledge creation is the thorough study of the problem; its background through observation, questioning, exchange of knowledge and analysis. These methods enable the creation of knowledge which gives more depth in problem definition and enlighten the people about the truth by themselves in order to understand the problem fundamentals through cause and effect approach. Once they are aware of the problem, they will share a sense of involvement in seeking a remedy for the problem and then join forces to work together to solve the problem. This becomes the social movement aspect. The last component is the political linkage. When dealing with the population at large, addressing only the social movement is still insufficient, political support is required to expedite the overall process. Local politics play a very important role in policy development and budget allocation. Local politicians are elected into office by the community and is therefore supposed to look after the well being as well as serving the needs of their respective constituents

2.1.2.1 Knowledge Creation

Knowledge creation is the most important component due to the fact that without knowledge, social movement and political linkage cannot progress. Despite its importance, it is extremely difficult to formulate. Knowledge creation means that we have to realize what the problem is, what is causing it and how to eventually solve it. Critical thinking and systematic reflection are the principles based upon wisdom that focus at how knowledge should be correctly applied, how to thoroughly investigate problems and discover the truth. It is the ability to look at things with critical eyes and break them into their basic components based on knowledge (Gillette, 1994). Therefore, in the process of intellectual development, critical reflection plays a primary role for one in becoming a knowledgeable person. Knowledge leads to critical thinking and helps develop the ability to think rationally which will ultimately culminate into a highly developed level of wisdom. The developed thinking must be structured, rationalized and harmonized with the cause and circumstances. If we know about the problem well enough, chances are that we may be able to solve it. Therefore, knowledge is the most significant foundation for a thorough understanding of all problems that need resolution.

2.1.2.2 Social movement

The social movement defined by Antrobus (1989) is "a jointly organized effort with endeavor by a considerable group of persons in some way to change or alter the course of events by their joint activities". He further elaborated that "this group may be highly organized or only loosely associated, from the civil right movement to the human potential movement".

It may be said that the social movement often involved struggles to establish rights. These include rights to proper environment, rights to livelihood. To the extent that many demands of the social movements are based on struggle to establish right, it means that they are part of the attempts to create or recreate a civil society. The social movements are not the equivalent of a civil society, but they may be seen as participating in the process of constructing that society or of recovering it from the state (Epstein, 1995). We can look at social movements as organized activities with leaders,

members, and resources just like firms but in our particular case these are the locals that live alongside the riverbanks

Group leaders will control members within the group during meetings and conducting activities. The mode of leadership can vary widely where some can establish themselves as an solid anchor of the group. Techniques used for spreading the words of the movement are through propaganda although in a positive sense. The methods used are public hearings, news on radio, in newspapers and newsletters, symbolization, and dramas. These various techniques are used to attract attention and to stimulate thought provoking discussions during group gatherings.

In conclusion, social movement refers to civic consciousness in the society as partners working together with love and care under a common goal. The community creates new tremendous social power besides governmental and corporal authorities. It also proves that this collaboration forms a civic organization in both official and unofficial way. The cooperation establishes the modern social structure with horizontal interactive relationship and, when integrated with the vertical structure, it enables closer examination of situations and produces forces for stable, solid and sustainable development.

The social movement may well influence the politics. In fact, a participatory community is most powerful nowadays in the world. The social movement inevitably reflects wider policy changes and has direct effects towards politics. Politicians, being elected by people in the community, have to respond quickly to their needs. It is the direct responsibility of community leaders to protect and look after the well being of their people during times of crisis.

2.1.2.3 Political linkage

Politics and government are a part of the human cultural legacy since the beginning of human interaction. In case of major social problems, individuals and the community can rarely solve the problems by themselves without the need for political linkage or interference.

Politicians are elected to represent people in the community in order to speak out on their behalf. Politicians can influence social changes because they have the authority in issuing new policies and regulating existing ones, passing out and controlling the budget and coordinating work with government sector. If a leader of a political party who commands respect from the people participates in the problem-solving process, the resolution will be much more effective.

In Thailand, an elected local politician can be an influential member of an organization, where he/she can exert more control on the decision process, allowing the organization to function effectively. In instances where the two entities are separate, meaning that the elected politicians are not prior members of a local organization, it behooves to have a strong community organization work hand in hand with the politician, pooling together each others resources to achieve the same goal of serving the communities they are supposed to look after. When such conditions prevail, it will be a testament of what can be truly called an "empowered community".

The combination of the Four Nobel Truths (Ariya-Sacca) and Samliam Kayern Pookuo in the problem-solving approach strengthens the process of solving complex problems in our current society. While the Four Nobel Truths emphasizes on individual problem-solving aspect, the Samliam Kayern Pookuo approach mainly focuses on dealing with problems at the community level. When these two approaches are integrated, the problem-solving method turns out to be more systematic and effective as diagrammed in Figure 2.3. In the past, the problem-solving method was not conducted on a continual basis because of the fact that people worked at it on an individual basis without any coordination with others and no support system in place In contrary, the Samliam Kayern Pookuo is a partnership theory that concentrates on common interest in solving community problems. The theory preaches group planning and implementation in a unified direction.

The strong point of the Samliam Kayern Pookuo approach is a long-lasting development strategy, which consists of three components in developing some concrete objectives as follows:

    a) Awareness of the enlightenment, exchange of experiences, new knowledge, local wisdom and new technologies amongst the people in the community as well as the exchange of problem solving methods so that people will be well versed on the options available.

    b) Generate a tri-partnership networking between the three entities, local organizations, the communities and the politicians

    c) Create talented leadership within the community who are self directed in solving community problems.

    d) Change attitudes and create awareness among the stakeholders toward achieving long lasting results by using problem solving approaches discovered by the communities themselves during the learning process.
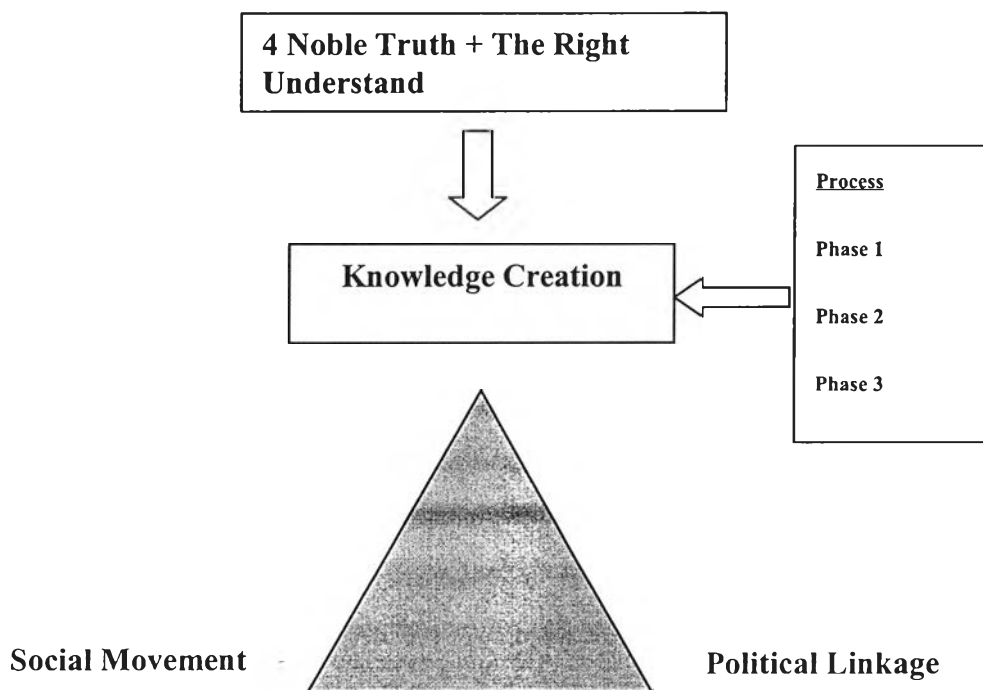
Figure 2.3 : The relationship of proposed theories

2.1.3 Community Participation

Community participation is widely used in the field of development and in the planning process of projects. It is considered one of the strategies necessary for sustainable developments. Participation is based upon three important concepts as follows:

1) To have common interests and concerns over the same issues. This results from uncoordinated individual interests and concerns which are then developed into shared interests and concerns of the community.

2) Afflictions and dissatisfaction over the current situation can push people to get together to form a group seeking ways and taking action to change the status quo.

3) Agreement is made within a group or community to change the current condition for a better one. This agreement or commitment has to be strong enough to initiate further actions which earn the approval from the majority of people involved in the project/activity.

Participation is collaboration, this refers to the fact that people are willing to take part by any means in the implementation of an action plan for a project Usually it comes in the form of cooperation; either by making monetary donations or offering time and labor in order to arrive at the goal mutually beneficial to all involved parties

Participation is a specific target of project benefits. This definition intends to cover unprivileged or neglected groups of people; such as, landless people, the poor living in town and low-income agriculturists. They are encouraged to be involved in the participation process with hope to gain benefits as project beneficiaries. This interpretation causes negative reaction toward the meaning of participation as equal to benefits. In other words, participation is about gaining benefits and who receive the benefits. As a result, this definition must be essentially combined with beneficiary assessment.

Participation is empowerment, the concept of participation as empowerment of people is greatly supported by the public as "empowerment" is becoming an accepted

and widely used term. This definition is a transfer of authority back to the people in the form of participation. It also includes access and control of resources as well as negotiation power in politics and freedom in opinion (WHO, 1993).

Participation must be active. Access to services and involvement in certain activities are considered "involvement" and not "participation". The difference is that participation must involve choices. This means that in every kinds of participation, people must have the right to choose and decide which option is most beneficial to them because it will directly affect their livelihood. Participation choices must be effective. When a particular choice is selected by the people, it must be effective enough to achieve the objectives and expectations of the people. (Oakley & Marsden ,1984).

Participation is a strategy for sustainable development, participation should be actively driven by the people in the community and not just being merely involved or cooperative or waiting for assistance from external organizations and governing bodies (Srinivasan, 1990).

Participation is viewed as a procedure to ensure that the participation or cooperation takes place in a project. Participation had a role to support and contribute to the success of the implementation. However, this approach depends on external organizations to provide technical support in the project implementation to move forward. This concept is well known as "participatory development". (Oakley & Marsden, 1984).

Participation is considered as a goal in itself. Empowerment can be conducted through capacity building so that people have skills, knowledge, and experience and then they are ready to take more responsibilities to improve themselves. For the unprivileged people, participation is a tool to bring in these people to be more directly involved, especially in self-development initiatives.

In conclusion, participation refers to a mental and emotional involvement of an individual in a group situation. Effects of the involvement make contributions for goal achievements and also create a sense of responsibility among members in the group.

Rifkin (1988) explains that community participation is a social mechanism which a specific group of people wants. These people live in the same geographical area and are eager in identifying their needs, making decision and setting up mechanisms to obtain what they want. This does not include an involvement of external organizations.

Askew (1986) provides a clearer definition of community participation as "a process of learning and empowerment. People in this process are characterized as a partner in a development project with whoever coming into the community to help identify problems and needs as well as to raise degree of responsibility of people in the community in planning, management, controlling and evaluation of all actions which have been justified as necessary to conduct".

Community participation depends on ideologies, which define conditions and set a goal of changes. If it means beyond the cooperation, participation is meant to be supportive by encouraging people to improve their capacity by themselves and allows as least as possible an involvement from the public sector.

At present, community participation is a concept, which deals with mechanisms and decision making process which are becoming a social ideology. It is now a human right which transmits authorities from the government to people. It is beneficial for the poor or those in lower social status to become motivated and active to take part in the thinking, planning, implementing and evaluating process.

Rifkin (1988) formulates five levels of participation as follows:
Level 1:   People participate in benefits gained from the project.
Level 2:   People participate in activities of the project.

Level 3:   People participate in the management and decision making process of the project.

Level 4:   People participate in controlling, monitoring and the evaluation process of all activities.

Level 5:   People participate in the planning of activities, which is relevant and necessary to meet the community needs.

American Public Health Association (1983) develops three levels of participation as follows;

1. Decision making level

People participate in the planning and organize the implementation by themselves. This step can be considered as level of responsibility by themselves.

2. Cooperation level

External organizations play an important role in advocacy. The community must make sacrifices of time, energy and sometimes properties to gain success. So, this level of participation is considered an "acceptable level of participation".

3. Utilization level

The community agrees and makes use of services as planned in the project but this kind of participation is viewed as an acceptance of the services or as a level of receiving benefits.

Importance of Community Participation

As previously stated, community participation is a tactic or strategy of sustainable development. It leads to the following concrete outcomes:
(Theerapong Kaewhawong, 2000)

1. Improvement of volunteers' capacity in various fields; such as in public health, general community development or community safety. Community participation can stimulate and create leadership roles in the community besides those that occurred naturally. In addition, it provides

an avenue for the community to solve problems on its own and to initiate activities that will improve the well being of the people in the community as a whole.

2. Learning and exchange of experiences among people in the community. People will gain new knowledge as the result of the exchange of information on local wisdom, new technologies as well as experiences gained from work.

3. Establishment of networking between various parties which include the public sector, the private sector and the community whereby creating what can be called an "Inter-sectoral Network" allowing everyone to work together. The most outstanding example at present is the networking of the AIDS prevention and problem solving at the community level that comprises of community leaders, public health volunteers, private organizations and government officers as well as disease carriers themselves.

4. Formulation of activities useful for the community and awareness of problems in the community. These problems are studied to seek solutions. Local resources are allocated appropriately to arrange activities. Support from people can be labor, properties, ideas or fund raising to support useful activities for the community.

5. Change of attitude and create a believe in sustainable development. People in the community change their attitude and become aggressive in solving problems and develop their community by using its local wisdom.

6. Allocation of budgets from local authorities and governmental bodies to support the project implementation of the community. Other resources are also allocated to strengthen the community.

All of these contribute to sustainable development of the community. It is obvious that community participation is the heart of the development and problem solving in the community. It is now a 'must have' element in every viable project.

In addition to the importance of community participation, the followings are the benefits derived from community participation. (Pongpisud Jongudomsuk, 1997).

1. Expanding the coverage of projects.

Usually projects cover only certain groups of beneficiaries but not all of them. Community participation helps expand scopes of work and includes more people, thus gains support from the public.

2. Increase Efficiency

Procedures in community participation; such as, planning, implementation, monitoring and evaluation, need balanced combinations of resources, activities and efforts in implementation, minimizing the redundancy of practices and assigns duties to responsible persons.

3. Increase Effectiveness

Effectiveness increases because problems are prioritized. In addition, goals and strategies are set and work schedules are planned for the implementation. All of these efforts are made to decrease work redundancies by using local wisdom, skills and resources.

4. Equity

Community participation promotes equity of people to share responsibility and strengthen unity in response to needs of community. It seeks better ways to get access to resources and services.

5. Self-reliance

Community participation promotes self-awareness and convinces people that they can solve their community's problems in the right way. Participation increases the capacity of community in controlling and monitoring factors which can affect their lifestyle. It also promotes learning and makes people better equipped to tackle larger projects at the regional or national level.

2.2 Empowerment

Empowerment is known as the process of acquiring more power which basically refers to the ability within which all people have to gain understanding and control over personal, social, economic, and political forces in order to take action to improve their life situations (Israel et al., 1994 ; Rappaport, 1985). The empowerment process is multi-dimensional varying from individual to individual and culture to culture and occurring at three different levels; personal, group and community.

These three levels are interconnected and have strengthening effects on each other. Based on Israel et al. (1994), empowerment at individual level contains three elements: (1) personal efficacy and competence, (2) the psychological quality of sense of mastery and control, and (3) a process of participation to influence institutions and decisions. An empowered individual can be an influential member in an organization, exerting more control on the decision process, allowing the organization to function better and in its turn to exert more control on the process of policy and decision making within its community. Therefore, it may be a strategy of organizations to enhance the empowerment of their members. One can speak of an empowered community when individuals and organizations use their resources and skills in collective efforts to meet their respective needs. This can be through the dynamics of providing support to each other and addressing conflicts within the community. As a result, the community acquires increased influence and control over its quality of life.

Empowerment can also occur both as a process and outcome (Isreal et al., 1994). Used as a process, "to empower" refers to enabling people through a social action process in gaining control over their lives (Wallerstein & Bernstein, 1988). Therefore, as a process, empowerment means helping people to develop their ability to gain control over their lives in their society. Used as an outcome, empowerment refers to the resulting change in the performance of the individual being empowered.

Compared as a "reflexive verb", empowerment reveals that individuals can only empower themselves (Purdey et al. 1994) and to become empowered, they need to have

a strong will. Power, therefore, cannot be given as it can only be taken by the ones who need it. (Rappaport, 1985).

Although the empowerment process is highly intentional and individual, it can involve both people who empower themselves and outsiders – usually professionals – who act as facilitators to assist them. The professionals can step in to help facilitate participants through a problem-posing education to unveil reality and to build a sense of consciousness and confidence among people (Rains, 1995). Such partnerships play an important role in empowerment processes, or in waste disposal management activities in my section on participation research.

The significance of "Empowerment" is to support the independence of individuals, organizations and communities. They should have self-control and can determine the community and societal future as well as their own future. The empowerment is a collaborative process with others in the community in order to transform into a satisfactory way (Walterstein & Bernstien, 1988).

For this study, the ultimate goal to which all exercises of empowerment should lead is the promotion of safe, stimulating, satisfying and enjoyable surroundings, which are conducive to health. Since the 1986 Ottawa Conference on Health Promotion, they are known as "supportive environments for health". In contrast to a degraded environment, that poses threats to people's health, a supportive environment "is free form major health hazards, satisfies the basic needs of healthy living, and facilitates equitable social interaction" (WHO, 1993). Haglund et al. (1996) present a brief summary that both health and supportive environments are "interdependent and inseparable".

2.3 Participatory Research

2.3.1 Definition and main focus of Participatory Research

Participatory research can be defined in many aspects. Sarni (1992) defines the participatory research as "a process through which members of an oppressed group or community identify a problem, collect and analyze information, and act upon the problem in order to find solutions and to promote social and political transformation" while participatory research by Cornwall (1995) refers to "a political economical activity, the purpose of which is to create shifts in the degree to which members of a group increase their options for concrete actions, their autonomy in using these options, and their capacity to deliberate about choices for action".

What distinguish participatory research from traditional approaches to social science, according to Finn (1994) are three key elements; people, power and praxis. Brown (1985) explains that participatory research is people-centered as "the process of critical inquiry is informed by and responds to the experiences and needs of oppressed people". In addition, participatory research is related to power that is vital to the formation of reality, language, meanings and rituals of truth (Reason, 1994). Empowerment can be involved in participatory research through the development process of common knowledge and critical awareness that are suppressed by the dominant knowledge system. Participatory research is also about praxis (Lather, 1986; Maguire, 1987) as "it recognizes the inseparability of theory and practice and critical awareness of the personal-political dialectic".

Participatory research consists of three principal activities: research, education, and action. It is a research method which allows people to be actively involved in conducting a systematic assessment of a social phenomenon by identifying a specific problem for the purpose of solving it. It can be considered an educational process because researcher and participants learn and together analyze causes of and possible solutions to the problem. Moreover, it is an action-oriented activity because findings are implemented as practical solutions. Spradley (1980) suggests that these three activities can be conducted in a participatory way between outside researcher and participants.

A key issue in participatory research is the question of who create knowledge, how they create it, and who makes the decisions for actions to be taken. As the outside researcher may impose his/her view and analysis of a given situation, leading to research and actions irrelevant to the community, participatory research emphasizes that the problem must be identified and analyzed by community members. Tandon (1996) remarks that participatory research ensures that "the focus of research will be for the community benefit, thus optimizing the search for solutions to problems".

Radical transformation of social reality and improvement in the lives of the people involved are the ultimate goals of participatory research and the community members themselves are the primary beneficiaries of the research. Participatory research facilitates the achievement of these objectives because it is instrumental in three fundamental areas: 1) the participatory creation of knowledge 2) the development or strengthening of grassroots organizations and 3) the development of collective capacities (based on 1 and 2) that encourage an understanding of reality in order to change it (Wang, 1994).

Heron & Reason (1997) recommend beginning the research process with a concrete problem or issue that the people themselves intend to address. In addition, they suggest the researcher not to develop any theories to be tested beforehand nor identify problems based on his or her experiences.

2.3.2   Conceptualizing the Research Process

In participatory research, knowledge production is considered a dynamic process of "engagement, education, communication, action and reflection" (Finn, 1994: 27). Knowledge exists in our everyday lives and we constantly transform it through what we do. Knowing is part of our life; it informs our actions. Critical learning comes from the scrutiny of everyday life. Park (1993) points out that the knowledge does not come from analysis of data about other human beings but "from sharing a life-world together – speaking with one another and exchanging actions against the background of common experience, tradition, history, and culture". He also emphasizes that "this engagement and its impact on ways of looking and developing knowledge are more important than the articulation of a set of techniques that can be mimicked".

Like all research, participatory includes at least four major phases: definition of a problem, choice of methods, analysis of data, and use of findings. But full and active participation of the community is required through the entire process of participatory research. In addition, people in participatory research are genuine participants. They actively participate by implementing and taking control of all activities during the research process rather than simply involved as data givers or recipients of research findings. They are the main actors in all activities starting from identifying the research problem and the way the problem should be studied, selecting methods to analyze data, implementing the research activity, and transforming results into action. This involves two kinds of participation; 1) tactical or technical participation where people are involved in all research activities and 2) strategic or political participation, through which people acquire power and control over a given situation, the research process itself and the problem they are working on (Cornwall, 1995).

Participatory research primarily focuses on the principle of shared power and complete control by the people in the research process which is different from other conventional research approaches which the researchers have absolute control over the process. In participatory research, power sharing begins with a shift in the most basic power relationship in research: the relationship between researcher and research participants. Maguire (1987) explains that participatory research "is structured to shift power and control over decision-making and actions increasingly into the hands of participants" and if we can encourage the participants to be involved in the entire research process, this will also increase the potential for a more equitable distribution of benefits. When the "objects" in the conventional research become "subjects" and partners, Maguire points out that "they benefit not only from the opportunity to learn about and understand their own reality, but also from sharing directly in subsequent policy and program decision-making and control". This practice of participatory research has demonstrated that the central issue controls over the process of knowledge generation and use, not over tools and techniques.

Notably, it is important to recognize the role of the researcher in an initial phase to control over the participatory research process, particularly when the initiative comes

from the researcher. But this control must gradually shift into the hands of local people and groups. Thus, it is not a priority control but, instead, this shift of control over time, during and after the process, that is important. However, this does not occur automatically. The people, along with the participatory researcher, have to consciously work to bring it about (Spradley, 1980).

Sarni (1992) said participatory research aims to create shifts in the balance of power in favor of the oppressed and it is suggested as a tool for the oppressed people to use to take control of the economic and political forces which affect their lives (Spradley, 1980). Greater control by community groups may take place in three major areas: 1) control of the research process, which ensures the new knowledge comes from the people's experience, is related to their perceived needs, and is used for their own benefit.2) control of the context, i.e., where and when findings will be implemented into action, and 3) control over broader aspects of society

Cornwall (1983) emphasizes the importance of promoting shifts in power and assuring that community groups are in control of those changes. Increases in power are the outcome of successful resource development and management, and are manifested by 1) an increased capacity for reflection developed by groups before taking action, 2) a broadening in the range of options for actions to be implemented, and 3) a greater degree of freedom and autonomy in implementing actions.

2.3.3   Setting the Research Process in Motion

Similar to natural processes of social movements, participatory research starts with the formulation of groups and the situations which bring people together need to be understood. Typically, participatory research begins with issues emerged from the day-to-day problems of living. This view is based on the epistemological ground that people's understanding of life is formed by their life experience. However, as the problems are not always raised or taken as a consensually derived target of struggle, the researcher has to step in and plays an important role by working with the community to help turn its felt but unarticulated problem into an identifiable topic of collective investigation.

Gillette & Tandon, 1994 suggest before starting the research project, researchers need to develop an informed and critical view of the daily realities surrounding research issues. They need to be knowledgeable about the specific substantive content areas of a research topic, about the cultures and life experiences of those whose lives would be the focus of the research.

Brown (1985) adds that the researchers also need to pay attentions to how members of a group perceive and speak about their lives. This means they must learn everything that can be found out about the community and its members both historically and sociologically through available records, interviews, observation, and participation in the life of the community.

Ideally, the researcher should live in the community and is involved in its affairs. However, in realities, the researcher is not an established member of the community. For this reason, he or she must learn as much as possible about the community in order to become a committed participant and accepted by the community.

After gaining trust and acceptance from the community, the researcher should explain the purpose of the project and begin to identify and solicit help from key individuals who would play an active role in the project execution. This initial organizing phase of the project can take considerable time and effort and demand interpersonal and political skills of the researcher as an organizer. Park (1993) defines the role of the researcher in this phase as a discussion organizer and facilitator and as a technical resource person as he/she needs to initiate and strengthen collaborations with organizations, such as, a community development agency, social service agency, or community health clinic while making contacts with members of the community, trying to activate their interest in the problem to be dealt with by action-driven research, and help to organize community meetings where the relevant research issues will be discussed.

It is, however, noted that in participatory research, many processes are likely to go through such planned processes. The researcher may face certain challenges through the execution of the project. Although participants may agree that they want to learn about themselves and their environment and improve their situation, but it may not be easy to give a clear description of the problem issue, let alone to set a concrete objective. Even if it were simple to set a detailed objective from the outset, the full order of sequences of formal steps to be taken to reach that outcome would not be easily determined. Given the reflective character of participatory research, Hart & Bond (1995) remark that each step depends on the outcome of the previous one.

2.3.3.1 Concern

This aspect deals with questions of who takes the initiative and how to access to potential participants. When someone expresses a concern about a certain situation, there is a sense that a problem exists, or that a certain issue should be studied, but there is no problem statement yet. But if the concern is formulated by a researcher, then it often excludes the participation of the communities upon whom the research will be carried out, which raises the issue of researchers acquiring access to them. If they have not requested any research activities, the researchers may be perceived as intruders. So, the researcher should make all efforts to earn trusts from the community in this phase and if possible take the form of contracts between all parties involved.

2.3.3.2 Problem identification, information gathering

This is a very important phase for researchers and communities to try to obtain a clear picture of what the problem is. As they will engage in a dialogue, they need to acquire information about the community as much as possible to boost the community participants' self-confidence. This is a crucial phase regarding the formation of a sense of ownership of the research process by all parties involved, especially the participants from the communities.

2.3.3.3 Investigating alternative solutions, planning for action

An inventory is made of possible solutions or means available to the community to implement each solution, following which one or more courses of action are adopted.

Action could be seen as a hypothesis that should be tested in reality. In this phase a decision about monitoring and evaluation procedures must be made.

2.3.3.4 Action

The participants carry out the action as planned in the previous phase and "test it out". They make observations on its different aspects.

2.3.3.5 Reflection, evaluation

Based on their observations during the action, the participants discuss alternatives that would lead to improvement. Negotiations can possibly happen at this stage due to different interests between researchers and community participants. It is vital for participants to reflect on their past actions to avoid that they become dependent on outsiders (Gianotten & be Wit, 1991). According to Eisen (1994), the most important thing in this phase is the participants, through reflection and control of the program, change their norms themselves and thus adapt their behavior, as opposed to behavioral change induced from outsiders using merely advice or recommendations.

3.3.3.6 Possible redefinition of the problem, new action

Problems may be redefined or new search of information needs to be conducted after the reflection process. Ultimately, a new course of action can be defined with all its implications of observation and reflection.

2.3.4 People's Participation

To initiate new, equal partnership, both researchers and the community members need to break up old, hierarchical patterns of interactions by making clear commitments to continually scrutinize their interactions among all collaborators. Gould (1995) explain this in practices as "at appropriate times, community members must be willing to 'call' researchers on their unexamined assumptions of authority, leadership, expertise and in turn, the researchers must be willing to be confronted on such assumptions and to take a back seat to community experts".

Gould (1995) agree that researcher/community partnerships are more likely to succeed if all participants are expected to share responsibility for acknowledging and discussing patterns of interpersonal conduct. In this way, the collaborative researchers strive for an equivalent voice rather than a dominant voice in the research process.

2.3.5   Research Design and Method

Although in theory, participatory research embraces all available social science research methods, it excludes certain techniques that require a separation of researcher and the researched because participatory research is based on the principle that people with a problem carry out the investigation themselves and promotes partnerships between researchers and the people under study (Shor, 1992).

In addition, due to the fact that participatory research aims to simplify research methodology and encourage participation of the people so that they can use it as a tool of empowerment, methods that are beyond the technical and material resources of the people involved in the research are also excluded. So, field observation, archival and library research, and historical investigation using documents and personal history, narratives and story telling, as well as questionnaires and interviews have been generally used in participatory research.

Shor (1992) compares both researchers and participants as 'actors' in the investigative process as they work together to influence the flow, interpret the content, and share options for action. Ideally, this collaborative process is empowering because it (1) brings isolated people with common problems and needs together; (2) validates their experiences as the foundation for understanding and critical reflection; (3) presents the knowledge and experiences of the researchers as additional information upon which to critically reflect, (4), contextualizes what have previously felt like personal, individual problems or weakness, and (5) links such personal experiences to political realities. The result of this kind of activity is living knowledge that may get translated into action. Participatory research reflects goal-oriented, experiential learning, and transformative pedagogy

A key methodological concern in participatory research is communication as it draws upon creative combinations of written, oral and visual communication in the design, implementation and documentation of research. Grassroots community workers, village women, and consciousness raising groups have used photo novella (people's photographic documentation of their everyday lives) to record and to reflect their needs, promote dialogue, encourage action, and inform policy (Wang & Burris, 1994). Researchers use theater and visual imagery to facilitate collective learning, expression, and action (Antrobus, 1989). Other forms of popular communication are utilized; such as, collectively written songs, cartoons, community meetings, community self-portraits and videotape recordings (Sarri & Sarri, 1992).

Critical knowledge development triggers a creative combination of traditional methods of inquiry and new approaches. Use of alternative communication methods in participatory research has pushed researchers to re-examine conventional methods and seek the possibility of using methods that previously would not have been considered legitimate.

From this perspective, democratic collaboration with disenfranchised groups is the most important for valid social work research for a number of reasons. First, as Nancy Hartsock (1987) suggests, those who experience disenfranchisement have the most potential for analyzing and understanding what that experience is, and how that experience must be transformed. Experiential expertise is therefore critical to social transformation. Second, the social work values of self-determination and empowerment affirm the importance of self-definition that places the client's knowledge of self at the center of social work practice. Third, self-determining goal of social work practice is not a self contained process, but rather is in relation to one another who can develop linkages and explore reciprocities, collectively explore the real commitments that define their lives as human beings, and create a vision of self actualization in its social environment (Nancy Hartsook, 1987).

2.3.6 Role of the facilitator

In participatory research that is dually characterized as a way to generate more knowledge, and to enhance social change, any outsider who initiates a project can either become more as a researcher or more as a community worker, depending on his/her perspective and interest. It is difficult even for persons with a strong research perspective to escape, if not the role of a community worker, than at least one of a facilitator. The term "facilitator" will be used to indicate the person that is involved as an initiator and – indeed – facilitates the course of a participatory research project. However, consistent with the option for the empowering type of participatory research, a notion of facilitator will be applied closer as a community worker than as a researcher.

Basic principles of empowerment of participating communities should be reflected in the facilitators' attitude. Consequently, the facilitators should assure that all thinking and activities originate from the participants themselves. This idea is in line with Freire's problem-posing method that focuses on peoples' perceptions about the world in which they live. It requires strong disciplines from the side of the facilitators to try to understand the participants' views and accept them as a starting point, even if they may conflict with their own opinions (Cornwall et al., 1995).

An interesting affirmation of this statement and what it implies is given by Schratz et al. (1995), who quotes a group of Australian community workers characterizing their own role. Considering themselves as catalysts, they do not impose, but stimulate people to change by addressing issues that are of concern to them. Thus, they enable people to develop their own analysis of their issues, starting where people are, not where some outsiders think they ought to be.

According to Whyte (1984) facilitators should use their social skills to stimulate participants' self-confidence, enhance communication, and promote viewing familiar and complex situations from a different angle Indeed, in the beginning of a project, the facilitator may need to boost the participants' confidence and trust in their own capacities, not just affirming the validity of what they know, or giving direction. An

interesting feature of such a process of confidence building is a sort of equalizing movement in which the facilitators relinquishes their superior status of specialists, and assume, in a Freirerian way, a status equal to the participant.

3.3.8 Rationale for using Participatory Research

The researcher has decided to use participatory research for this study because of the following reasons;

1. Participatory research is a method that promotes self-awareness through the process of self-reflection and visualization of the problem. Consequently, participatory research will lead to self-imposed action which is more likely to be acceptable and followed up than actions imposed by other methods. With this view, participatory research will be applied to study the empowerment process of people living along the Yom riverside in Sukhothai Province. It is expected that this process will enable them to implement participatory research in dealing with the waste disposal problem and this approach will bring stakeholders to jointly make effort to reduce the waste disposal problem through collective insight into the deep underlying causes and develop appropriate model of action (Israel et al., 1994).

2. Unlike other research, participatory research promotes learning by doing. The participants are fully involved in the identification of issue and in planning and implementing action for resolving the issue. A feeling of ownership and commitment developed among the participants will result in a long-term continuation of the action. The empowering effect of participatory research does not only solve the immediate problem, but it can produce the ability in solving other problems as well (Rains & Ray, 1995).

3. Participatory research promotes sustainable development. Through continuous analysis and interpretation of data, the participants develop collective understanding of the problem and gain knowledge and confidence to solve problems. Using the principles of group dynamics,

participatory research is concerned with process training in bringing personal and social change (Scudder, 1991).

4. Conducting the participatory research will be perfectly completed if the community base approach is applied which means that people know and understand the research process. In other words, people conduct the research by participating in every procedure from the beginning to the end. The method will encourage mutual understanding towards the problem and create common perceptions of struggling and shared goals. It will lead to the establishment of unity and community spirits, which enable brainstorming, participatory research, and share of finding between villagers and researchers. The community will realize its power and shows confidence to succeed and overcome the problems.

5. From insiders' perspective, the research method, which is able to obtain as many pieces of information as possible, has to examine people within the group especially about their behaviors. It is important to recognize people's thoughts that have values and reflect meanings they have given to their individual self. Therefore, the community-based approach must be applied in order to elicit the insider's view and to perfect the research methodology.

2.4 Community-Based Research

2.4.1 Community-Based Research is a Planned Systematic Process

Community-based research is a systematic process which requires careful planning in each stage. Most community research starts with asking questions about programs, the needs of clients, the effectiveness of the work, whether new ideas are feasible, possible solutions to existing community problems, and so on (Guba & Lincoln, 1994). But these issues become community-based research once a community issue is formalized into a researchable question and systematically planning for "data" collection and analysis. This formalized research process creates new knowledge upon which to base practice. It is the focus on knowledge development that distinguishes community-based research from community development.

2.4.2   Community-Based Research is Relevant to the Community

Community-based research must have a high degree of relevance to the community (Heron & Reason, 1997). Community-based research focuses at the context of daily work activities in order to solve problems and help make those activities more effective and ultimately more satisfying. The research should stimulate the community to make decision or provide information which in some other way is useful to the community.

2.4.3   Community-Based Research Requires Community involvement

Community-based research is a collaborative effort involving the community at all stages of the research process. According to Schratz & Walker, the community is actively involved in and understands the research process. In addition, the research in nature tends to be multi-disciplinary and is progressed through partnerships between the community and researchers.

The level of community and/or researcher involvement may vary at each stage of the research, but community-based research involves joint responsibility and decision-making during every step. It requires the researchers and the community stakeholders to share power and control of decision-making throughout the process.

In a community-based research process, the distinction between the researcher and the researched may be decreased to the least or does not exist. Community-based research emphasizes the unique strengths and contributions of each participant, rather than considering the participants make "equal" contributions, in the sense of doing the same thing. It goes beyond respect and trust for the person and includes valuing the work and perspectives of each participant. It is a synergistic alliance that maximizes the contributions of each participant and it focuses on shared responsibility for the research and research process.

2.4.4   Community-Based Research Has a Problem-Solving Focus

Effective community-based research helps clarify causes of problems and seek practical solutions of the problems. This problem solving focus implies that the

research deals with problems which have been identified by the community as important to that community. The primary objective is frequently to guide decision-making, so effective community-based research focuses on gains to the community through both the results and the research process itself. In addition, it focuses on change by creating solutions for existing problems and identifying future actions and policies that will most likely contribute to the health and environmental of the community.

2.4.5 Community-Based Research Focuses on Societal Change

Unlike conventional orthodox research which focuses only on prediction or understanding, community-based research attempts to make changes. It is based on the fact that that engaging in a participatory, collaborative research process, and being involved the decision-making about that process is empowering and transforming. Participation in the process allows people to develop new ways of thinking, behaving and practicing.

2.4.6 Community-Based Research is About Sustainability

With orthodox research and many forms of qualitative research, usually as the research ends, so does the project. Community based research makes a lasting contribution to the community, sometimes in the form of a new program that is ongoing, a new service that is delivered or products like manuals or workbooks may be created.

Enhancing capacity of the community is one of the most significant contributions to continue to engage in future research or evaluation. The acquisition of new skills and knowledge related to research and evaluation is an essential component of community-based research.

2.4.7 Participatory Paradigm

A paradigm is defined as "a set of basic beliefs (or metaphysics) that deals with ultimate of first principles. It represents a worldview that defines, for its holder, the nature of the world, the individual's place in it, and the range of possible relationships to that world and its parts, for example, cosmologies and theologies do" (Guba & Lincoln, 1994).

Guba & Lincoln made a significant contribution in articulating four differing worldviews of research-positivist, post positivist, critical, and constructivist-based on their ontological, epistemological and methodological assumptions. Heron and Reason (1997) argue for a fifth worldview - a participatory paradigm within which community-based research is situated and also embraces the ideology and methodology of co-operative inquiry created by (Heron & Reason, 1997).

A participatory paradigm is based on the belief that reality is interplay between the given cosmos, a primordial reality, and the mind. The mind "creatively participates with [the cosmos] and can only know it in terms of its constructs, whether affective, imaginal, conceptual or practical" (Heron & Reason, 1997) "Mind and the given cosmos are engaged in a creative dance, so that what emerges as reality is the fruit of an interaction of the given cosmos and the way the mind engages with it" (Heron & Reason, 1997). As Skolimowski (1992) states; "We always partake of what we describe so our reality is a product of the dance between our individual and collective mind and "What is there", the amorphous primordial givenness of the universe. The participative worldview is at the heart of the inquiry methodologies that emphasize participation as a core strategy",

2.4.8   Subjective-Objective Ontology

Ontology refers to the form and nature of reality and what can be known about it (Guba & Lincoln, 1994). In contrast to orthodox research that utilizes quantitative methods in its claim to be value free (but which is more accurately described as valuing objectivity), and many qualitative approaches that value subjectivity, community based research endorses a subjective-objective stance.

According to Abram (1996), a subjective-objective ontology means that there is "underneath our literate abstraction, a deeply participatory relation to things and to the earth, a felt reciprocity". As Heron and Reason (1997) explain, this encounter is transactional and interactive. "To touch, see, or hear something or someone does not tell us either about our self all or its own of about a being out there. It tells us about a being in a state of interrelation and co-presence with us. Our subjectivity feels the

participation of what is there and is illuminated by it". So, community-based research is interested in investigating people's understandings and meanings as they experience them in the world.

2.4.9   Relationship of Theory to Practice in Community-Based Research

Theory is an explanation of phenomena. It is believed that theory is implicit in all human action and is critical in developing evidence for community-based practice. Schratz & Walker state that theory can provide access to the unexpected questions and ways of changing situations from within. It is the relationship of theory to practice that is a key in community-based research. As Lewin (1997) declared "there is nothing so practical as a good theory and the best place to find a good theory is by investigating interesting problems in everyday life".

In contrast to orthodox science, theory in community-based is not something that is known and that "informs" practice. As Van Manen (1990) suggests, "practice (of life) comes first and theory comes later as a result of reflection". In community-based research, it is the cycling through the iterations of action and reflection in which experiential knowing and prepositional know are considered in relation to practical knowing that creates praxis and that generates evidence for future practice. This process grounds practice in theory rather than applying theory to practice.

This notion of praxis is a fundamental concept in Freire's work and is fundamental to creating evidence-based practice in communities. Praxis does not involve a linear relationship between theory and practice wherein the former determines the latter; rather it is a relationship in which both action and reflection build on one another. "The act of knowing involves a dialectical movement which goes from action to reflection and from reflection to new action" (Freire, 1972). Through critical dialogue, people become "masters of their thinking by discussing the thinking and views of the world explicitly of implicitly manifest in their own suggestions and those of their comrades" (p.95).

Praxis, therefore, is constituted by both a theoretical and an experience component and is mediated by dialogue. As Wallerstein (1988) explains "the goal of group dialogue is critical thinking by posing problems in such a way as to have participates uncover root causes of their place in society-the socio-economic, political cultural, and historical contexts of peoples lives. It is through this emancipatory dialogue that people are liberated to act in ways that improve society. Conceptualizing the relationship between theory and practice this way reorients our thinking about research from searching for understanding and explanation to ethical action toward societal good (Hills, 1999).

2.4.10 Conceptual framework for doing research

One process that is particularly well suited to community-based research is co-operative inquiry (Heron, 1996; Reason, 1994). Co-operative inquiry is a participatory action methodology that does research with people not on to or about them. This process engages people in a transformative process of change by cycling through several iterations of action and reflection. Co-operative inquiry consists of a series of logical steps including; identifying the issues/questions to be researched, developing an explicit model/framework for practice, putting the model into practice and recording what happens and, reflecting on the experience and making sense out of the whole venture (Reason, 1988). Therefore, evidence about what constitutes "best practice" is generated by people examining their practices in practice and reflecting on these practices.

2.4.11 Techniques and procedures for collecting data

The community-based research is not and cannot be method driven. The methods used to collect information about people and the human conditions derive from and are contained by the principles of community-based research, the preferred methodology (co-operative inquiry) and the research question.

In community-based research, the research questions, almost always, focus at knowing something about people or the human condition. In contrast to Orthodox method which excludes human subjects from all the thinking and decision-making that

generates, designs, manages and draws conclusions from the research; thus distancing them from the research process and outcome (Reason, 1994), community-based research involves people and encourages them to decide what are appropriate methods for collecting evidence and how the evidence can be interpreted. Heron (1996) states that "to generate knowledge about persons without their full participation in deciding how to generate it, is to misrepresent their personhood and to abuse by neglect their capacity for autonomous intentionally. It is fundamentally unethical".

In community-based research, whichever method is chosen, it needs to accommodate the notion of full participation of those involved. As a result, qualitative methods; such as, interviewing, journal writing, taped interactions, critical incidents, narrative accounts, and focus groups are likely to be used. This criterion of using appropriate methods has challenged community-based researchers to develop new and innovative strategies to access peoples, experiences and understanding. This way of thinking about research and the resultant methods that are used provide convincing evidence upon which to practice and to be in the world.

Summary

When working with people in communities, evidence-based practice must be based on the knowledge co-created by the community. By using an extended epistemology, community-based research broadens the response to the question. What constitutes evidence for community practice with people?" Community-based research acknowledges contribution of the community members towards co-creation of new knowledge. Its focus on practical issues, problem solving and change provides evidence for practices that is immediately useful and relevant to communities. By bringing together all stakeholders in the research process, it fully makes use of the outcomes of the research.

The significance of community-based approach is that people in the community receive and recognize all data from every step of the research process. So, they can take advantage from the data by using them to make decisions to find ways to solve their problems. The research process is operated by exchanging opinions between villagers

and researchers in order to systematically attain a conclusion. Synthesizing the summary by applying dialectic approach will develop problem-solving techniques and allow people to improve their self-learning progress. The data collected will be perfectly clear and reflected their viewpoints, characteristics, needs and ways of life.

2.5 Factors Relating to Waste Disposal

It is apparent that rapid population growth, economic growth and industrialization have been playing a significant role in waste generation. The consumption behavior of the people has also been contributing much in increasing the waste generation and in changing waste scenario from bad to worse. With a view to address this burning issue, development and practice of a suitable disposal system are getting increasingly important in recent years. Generated waste compelled human being in exploring and developing hygienic disposal systems for protecting nature, community health and the environment. Nowadays, waste disposal indicator is being used to indicator the amount of waste generation. Since it is difficult to make an estimate on the generation of waste either by rate of goods consumed or by weighing daily per head waste generation from each and every waste source, literature relating to waste generation and waste disposal have been reviewed as shown below:

2.5.1 Population and family size

The major factor that influences total waste generation is population. The unit of calculation pertaining to waste generation is per capita per day. Thus, if the population is more, generation of waste will be higher. Therefore, the rate of waste disposal depends directly on population. The report of the Department of Environment, North Carolina in U.S.A. (1993) about waste disposal shows a strong correlation between population and disposal of waste. Larger household size produced more per capita waste, but the findings does not confirm the claim of positive or direct correlation with population / family size and waste generation.

On the contrary, Jenkins (1993) in his study indicated that smaller household sizes produced more per capita waste. His findings also dose not confirm the claim of

positive or direct correlation. Another study conducted by Cailas et al (1993) found no relation between family size /population and waste generation. The average waste generation in five Asian cities as published in the HABITAT (1994), Kenya also projected a different story:

Table 2.2 : Waste generations in five cities in Asia

City	Pop. In 1000	Volume tons/day
Bangkok (1989)	5717	5040
Jakarta (1990)	8000	6570
Kanpur (1990)	1785	1430
Karachi (1990)	8750	4400
Manila (1990)	7833	3900

It appears that in Manila and Karachi, the quantity of waste generation is much lower in comparison to the population densities of other Asian cities.

The generation of domestic wastewater also depends on family size as the calculation in terms of flow depends or per capita generation. The report of Thai-Japanese Technological Promotion Association estimated the per capita flow as 130-180 liter per day as follows:

Table 2.3 : Generation of wastewater in Thailand.

Type	FLOW (Lit./cap/day)	BOD LOAD (Gm./cap/day)	BOD CONCENTRATION Mg/liter
Kitchen	30 – 60	20 – 30	500 – 800
Washing	50 – 60	-	
Bath room	40 – 60	7 – 17	50 - 80
Others	10	-	
Total	130 - 180	27 - 47	150 - 22

2.5.2 Income

Income has been identified to be positively correlated with waste generation. The study conducted by Gunnerson and Jones (1984) showed that per capita waste consumption is lower in countries having low income. The result of their findings are as follows:

Cost of waste disposal has a potential influence on waste generation. Greater cost might lead to less waste generation. The study of Daniel et al (1995) showed that higher disposal cost was associated with lower level of waste disposal.

2.5.3 Knowledge, attitude of waste disposal

It is a well established conviction that knowledge and attitude significantly influence practice. The generation and disposal of waste are not an exception to this phenomenon. A random digit dialing telephone survey among 504 subjects in Massachusetts was conducted by Tuthill et al. (1987). In that study, automotive oil was reported to be the most commonly discarded hazardous household material comprising 33% of the waste stream. Over half of the surveyed population (57%) disposed of this material via ground, sewer, landfill totaling 8.8 million quarts per year.

In a study conducted by Bass et al. (1990), it appeared that 61% of the respondents claimed that household cleaners were the most commonly used hazardous products. Scudder (1991) in a study to determine the community's attitudes and knowledge about household hazardous waste and disposal method showed that majority of the respondents pointed pesticides, dish water, soap, paints etc. as hazardous waste. The respondents were not aware of the environmental impact on land and water due to improper disposal of household waste, but they were aware of the disposal method.

2.5.4 Knowledge and attitude towards recycling and reuse

Recycling is still in an infancy state in the rural environment. In North America, promotion of three R's have evolved for solid waste management. Those R's are Reduction, Recovery and Reuse. In practical terms, due to the low cost of solid waste disposal, rural households have little or no incentive to undertake recycling, are as a

result recycling programs generally yields poor outcome. Nevertheless, many governments have set the goals of decreasing solid waste by at least 50% by the year 2000. Promotion of knowledge and attitude on recycling may contribute much to achieve this goal.

Recycling program needs peoples' participation for the sake of the environment and public health. A mandatory provision can not address the problem. Lee et al (1980) reported that mandatory recycling laws caused the supply of scrap to increase so much that the prices for recycled materials fell drastically, thereby undercutting the incentive to recycle.

Demand, supply and market also influence the people's attitude to explore and practice recycling. Tonge (1988) in a study on tyre recycling suggested that the demand for recycled waste product should grow over time as supply also expands. Shor (1978) found that Oregon's newspaper recycling rate (65%) was twice of the U.S. national rate (22%) and it was due to the market for the recyclable.

The report published in HABITAT (1994) on Significance of Recycling and Reuse stated that impact of the recycling and reuse sector of waste management in the cities of Asian developing countries was potentially high. Based on the studies in five Asian cities (Bangkok, Jakarta, Kanpur, Karachi, Manila) it is also reported that average current recycling rate of 7.5% would result in an annual cost reduction of over US $1 million per city.

Cost of disposal has a positive correlation with recycling and reuse. It appears from the report of Project 88-Tound-ii that pricing creates strong incentives for households to reduce generation of waste by changing purchasing patterns, reuse of products, composting of yard waste.

Masten (2000) pointed that waste disposal through recycling be encouraged by imposing tax on virgin materials. The reports of U.S. Congress (1991) and also of Sigman (1991) corroborated with the suggestion of tax imposition. Sigman (1991) in

his study report also mentioned that a tax on virgin lead was equivalent to a deposit refund system, when virgin lead and recycled lead were perfect substitutes in production.

Waste recycling brings about a financial return. Pongphist (1999) showed that this financial return might act as an incentive for the local people to be interested in the collection and handling of waste in a sanitary manner.

2.5.5 Practice of recycling and reuse

The developed countries have been practicing waste recycling more than the developing countries due to cost of disposal, composition of waste and other concerned factors. The analysis report of Husain (1989) stated that about 40% of Japan's solid waste was being recycled, including about 50% of the paper, 55% of glass bottles and 66% of food and beverage cans. But in the rural area, recycling was rare except the recycling of organic waste by some easy processes.

The treatment and recycling of household waste mainly organic waste can be most effectively accomplished by biological processes, employing the activities of micro organisms such as bacteria, algae, fungi and other higher life forms. The by-products of these biological processes include compost fertilizer, bio-gas production and biological recycled substances. The process of treatment/recycling needs sufficient temperature and thus biological recycling is more compatible in the tropical and subtropical regions.

2.5.6 Waste water recycling

The organic compounds of household solid/liquid waste either dissolved in effluent or associated with suspended matter pollutes the water. Biodegradation on decomposition consumes oxygen and causes severe oxygen depletion.

Past record of waste water hazards shows that since the establishment of Bangkok city in 1782 by the King Rama I, there has been an endemic situation with water borne disease. Based on the report in the reign of the King Rama 5th, Sudara et al.

(1992) reported that the water of Meng-Seng canal and Loned canal was too dirty during that period.

Charuthawai (1986) mentioned different aerobic treatment systems like extended aeration, oxidation ditch, modified aeration, mixed system, pure oxygen system, trickling filter etc. for waste water treatment. In her study the researcher recommended establishment of on-site treatment facilities due to some tangible and intangible benefits.

Wastewater has been used on the land for agricultural productions for a log time in the developing countries. The study reports of Chakravorty and Chakravorty (1988), Bielorai et al (1984) pointed about the potential benefits of sewage irrigation and sludge application for agricultural purposes. In rural Thailand, an indigenous technique known as seepage pit is being promoted to dispose of the household wastewater.

2.5.7 Health and pollution perception

Health and pollution perception usually influence the waste disposal, Nowadays, rural household waste stream also contains harmful products like plastic, batteries, medicine etc. which are injurious to health and environment. The report of US Environment Protection Agency (1984) described that neither the Government nor the people in general were aware of hazardous waste problem before the mid 1970s. Due to deteriorating situation of the environment, people are getting conscious causing a sharp change in respect to attitudes and practice. The awareness and response of people against the establishment of waste disposal plants nearby, have generated a new phrase NIMBY (not in my backyard) syndrome in environmental terminology.

In the study conducted by Charles (1994), all respondents indicated that automotive products can cause or attribute to health problems. In that study the respondents were grouped into four sub-groups according to their profession. They found no significant difference in overall health perceptions of the sub-groups. It is also revealed from that study that respondents who routinely used hazardous products would not believe those as hazardous. They pointed out that males and females respondents

indicated similar perceptions of the health risks posed by household hazardous waste. And also in the study by Charles (1994), it was also reported that 93% of the respondents recognized household hazardous waste like automotive oil to cause water pollution problem and 7% reported it as causing air pollution alone. The researcher did not find any correlation between perceived health or environmental effect and disposal patterns.

2.5.8   Promotional factors :

Promotional programs influence waste disposal practice by improving the knowledge and attitude of the people. In Thailand, promotional activities in regards to rural solid and liquid waste disposal are being done as part of the components of the environmental sanitation program. In this program, individual family is responsible for refuse collection and dispose of the same. The disposal methods, incineration and composting are being proposed through demonstration and by organizing motivational activities. Promotional activities on the usage of seepage pit and drainage systems have been incorporated in the program as the tools for liquid waste disposal. The report of the Sanitation Division shows a satisfactory coverage of 82.54% up to May/94.

2.6   Previous Waste Disposal Projects for Riverside Communities

Sukhothai Public Health Office has developed various programs to solve waste disposal problems of communities located along the river banks in hopes to protect the Yom River from further deterioration. The projects are detailed as follows:

1.   Volunteer for water source protection project

This project was launched by the Sukhothai Public Health Office, aiming to raise awareness of people living along the Yom River in protecting and maintaining the water quality of the Yom River and to develop a network of people for the surveillance of the water quality.

The project's implementation started by organizing a three day training for 1,000 villagers living along the riverbank. Environmental specialists were invited to

give lectures to the villagers in the following topics; background knowledge of sanitary environment, pollution in the water and the cause of the pollution, effects of water pollution to health, the surveillance of water quality, formation of volunteer groups for water source protection.

After the training, it was found that the participants were enthusiastic and interested in participating in the surveillance system of water quality in the beginning but lost interest as time goes by.

2. Water quality improvement for the community project

This project aimed to raise awareness and promote the love of people for the Yom River. The objective of the project was to train people to be able to use instruments to measure the quality of water; such as, DO (Dissolve Oxygen), PH factor, temperature, color and to observe physical changes which can be detected by the naked eye.

Volunteers and leaders of households were invited for training which included the collection of water from the Yom River for testing, the utilization of tools to easily test the water quality by measuring the amount of DO (Dissolve Oxygen) , the PH factor, the water temperature and color, and to record and report the findings to the Provincial Public Health Office.

This project also attempted to encourage people in the community to help improve the quality of water back to where it was once a clean river in the past. As a result, there were data collected indicating the level of water quality at several locations where the Yom River passes through.

3. Healthy city project

This project was developed in sub-districts which had strong communities. Leaders of households participated in a workshop using the AIC concept. (A stands for Appreciate, I = Influencing and C = Control).

The workshop started with the participants' introducing themselves to break the ice. The participants were asked to draw a picture of their community in the past reflecting problems facing their community. Next, they were requested to draw another picture of the future, how they perceived their community to be in the future. Comparing the two pictures to point out the differences. Then, they discussed about the operational plan to accomplish the ideal community and prioritize the importance of problems based on the problems' severity. They were also required to indicate methods to cope with the problems and identify what problems they can solve by themselves, what problems they need cooperation from others and which one they would like the authorities or government bodies to solve. The last activity was to delegate responsibilities for each problem and to proceed according to plans laid out.

The result found that waste, garbage as well as wastewater problems were listed as main priorities that needed attention in several communities. However, the authority or public sectors were delegated to take action and the evaluation of the project revealed that the project lacked continuity and commitment from participants to follow the agreed course of action.

4.   Seven main activities for good health project

This project was launched to demonstrate good health practices for communities located along the Yom River; such as, constructing toilets, incinerators, latrines, water tanks, models of a sanitary kitchen, proper disposal of animal waste and the development of rubbish baskets. The Provincial Public Health Office conducted this project with financial support from the Health Department of the Ministry of Public Health to develop sanitary related activities in the form of demonstrations for interested people. After that, funds were allocated as loans to the community to support the construction of their sanitation facilities.

The evaluation found that people showed interest in the activities which were free demonstrations but when they needed to do it by themselves with the provided financial loans, they used the money for other purposes and ultimately the funding came to an end.

5. Riverside sanitary toilet project

This project attempted to promote the use of sanitary toilets by using different strategies. Public health staff as well as local staff implemented the following approaches:

1. Made recommendations to villagers and community leaders during, meetings as well as during gatherings in local festivals
2. Provided consultations for individuals while they worked in the field or when they are in town.
3. Demonstrated or advised people when they go to the maternity ward, health centers, hospitals or governmental offices.
4. Informed people of pathological and digestive tract-related diseases which result from unsanitary toilets to raise people's awareness and concerns for the propagation of these diseases.
5. Teach school children the benefits of having a sanitary toilet by integrating it into the school curriculum.
6. Distributed posters about the issue to the community and villages.
7. Played movies/videos about the benefits of having a sanitary toilet to the people.
8. Constructed sanitary toilets in the maternity ward, health center and government offices as an example for people to see and use.
9. Organized trainings in good sanitation for people.

When people would like to build a sanitary toilet, they could ask for advice from the sanitation health officer or other personnel in organizations of the sanitary health office could demonstrate and the villagers can procure toilet facilities for themselves at a reasonable price. In some areas where the concept of a sanitary toilet is fairly new, the officers might have to spend time visiting households in the village to guide the construction of the toilet including the sterilization process and the use of water to maintain proper sanitation for the toilet.

The evaluation of this project found that almost every household in the village constructed toilets but the actual use of the toilet was rather low. Some people said they built the toilet just to comply with the requests of the authorities.

6. Project to generate biogas using garbage and disposed waste.

This project aimed to promote the proper understanding of waste disposal methods for waste and types of garbage, especially animal waste. This is because most people in the community rear animals; such as, dogs, cows, buffaloes, pigs, chickens, ducks and the waste that these animals produce, especially pigs, cows and buffaloes have caused disposal problems due to its larger quantity. The fact that most people's homes are built high above the ground which is usually wet, unsanitary conditions exist where flies and insects tend to congregate. To alleviate this situation, animal waste can be put to good use by disposing it in selected areas to be used for generating biogas.

Biogas is made as a byproduct of fermenting animal waste which has high amounts of organic compounds in the absence of oxygen. In animal waste, a bacteria called Methane Forming Bacteria degrades the organic compounds in a non-oxygen environment producing Methane Gas. Methane is a flammable substance, so it can be used as cooking gas for households. Furthermore, the Sanitary Health Division under the Health Department of the Ministry of Public Health has conducted relevant research, designed and developed health and sanitary promotion issues and disseminated these information to people living in the rural areas of Thailand.

Sukothai Public Health Office personnels built rounded shape containers with lids made of brick and plaster to be used for animal waste fermentation. Animal waste was left in containers for 3-7 days where the waste will degrade and generate biogas which can be used for cooking. The biogas is piped to the house using tubes. This method turns out o be quite useful in getting rid of large quantities of animal waste in addition to using it as fertilizers for crops.

It was found out in the project evaluation that the villagers were reluctant implement the plan because it would have an initial investment cost of about 4,500

Baht. The villagers did not have clear understanding and sufficient knowledge in solving some of the problems arising from the process while there were no continued support or follow-up from the officers concerned.

Summary of all projects

Based on the past projects implemented to solve waste disposal problems in the riverside community, it was found that most projects were conducted and initiated by the public sector and implemented by the officials without any direct participation from people in the community. Many of these projects were discarded and neglected by both the public sector and the local people as time goes by. All projects were designed and implemented in the same manner in all areas. No studies were made in differentiating the factors and circumstances associated with each of the villages.

In addition, these projects were formulated without identifying problems and issues of the people in the various communities and therefore it turned out that certain community needs were not served. This resulted in the neglect by the people leading to unsustainability of the project. In essence, the people merely followed the recommendations of the health officers in order not to displease them.

Consequently, the relationship or any contact between the health officer and people in the community was very limited and when people faced a problem, instead of helping themselves first, they immediately asked for help from the government because the public sector always steps in to try to solve problems which tend to be more of a general nature and not unique to or customized for a particular community. The government is not flexible enough to address individual village needs where local cultures, lifestyles, values and norms of the particular community all come into play.