



## CHAPTER IV

### RESULTS

The researcher systematized, analyzed, and elucidated the relationships of the data obtained from the field study by typological-taxonomic method. The attributes of the data were systematically analyzed and categorized for similarities and differences. The components of the data were examined for verification and detected for any replication by componential analysis. The data were also interpreted and examined for significance by ascertaining the information gained from them (Supang Chantavanich, 1997). The triangulation method was used to control the quality of the data. The reliability of the data was confirmed by examination and assured by the people in the study area, and the researcher read the information from the data and asked for comments, objections, or approval. The results of data analysis are presented in two parts:

Part 1 The results of the compilation and synthesis according to the objectives, i.e., sustainable participatory waste disposal, community awareness, and villagers' participatory ability to find solutions to waste problems based on local wisdom.

Part 2 Research results in three phases.

## **Part 1 The Results of the Compilation and Synthesis According to the Objectives**

The results found sustainable participation in waste disposal, community awareness, and villagers' participatory ability to find solutions to waste problems based on local wisdom. The details of the results are described as follows:

### **4.1 Sustainable Participation in Community Waste Disposal**

The participatory results are presented in two dimensions, i.e., that of the researcher, and that of the 40 leaders of the research team. The results of the analysis are as follows:

#### **4.1.1 The researcher's aspect**

##### **1) Building relationships and familiarity with the villagers**

Creating an atmosphere of acceptance in the community was an important condition for conducting participatory research. It led to the formulation of a research team that participated in identifying the actual problems of the community, including the full cooperation in finding appropriate solutions to these problems. The researcher embedded himself in the community for a long period of time, and engaged in different activities and ceremonies, establishing good rapport with the villagers. Moreover, he regularly joined activities held by different organizations in the community, for instance, the senior citizen's group, the village health volunteer group, the village development committee, etc. He participated in religious and cultural ceremonies, such as Tod Phapa (offering robes to Buddhist monks at the monastery), gathering donations of money, Tamboon Klang Baan Ceremony (village merit-making ceremony to be free from illness, accidents, and to obtain good luck and wealth), Rodnam Damhua (pouring sacred water on elders' hands to show respect, and receive blessings of happiness, longevity, good health, and success in carriers), and attending community sports competitions. As Pooyai Somnuek said "Dr. Dong (the name the villagers called the researcher) should relocate to Tupperng for good." All of the senior citizens in the community always referred to him using the prefix "luk" (son).

The researcher created an atmosphere of a close relationships in the community at all times and usually participated in community development activities as if he was a part of the community. He also engaged in the attempt to solve the drugs problem, the campaign to rid mosquito of a breeding ground, and act as a consultant to the community in areas that the leaders were not too well informed thereby strengthening the relationships between himself and the villagers. The way he carries himself during his research made the villagers feel that he was not an outsider, but one of the “team members”, working together with the villagers. The researcher allowed everyone to take part in the decision-making process as if they were the researchers themselves.

In summary, the researcher operated under a congenial and accommodating atmosphere, and fully put to work acceptance-making techniques, i.e., honoring people, treating the villagers with respect and being open minded to learning everything that happened in the village, being punctual, and responsive to the decisions of the villagers, building close relationships and familiarity within the community. The important issue in the research activity was that the researcher became acquainted with almost everyone in the community and not specifically only the group leaders.

## **2) Application of a simple solution model, easy to understand, and conforming to the context and culture of the community**

The integrated participatory together with the Four Noble Truths approach was the major mechanism used, which resulted in an excellent method for community problem-solving. Application and adaptation of these approaches to 40 research leaders who had different perception of things, were considered to be quite successful. They all accepted and understood the process quickly because they were already accustomed to the religious concepts and it was also made clear to them in a systematic way. They all knew what constituted the suffering of the community, the causes, and the objective of the solution. The group collectively found the way to achieve their goal successfully. The result was the introduction of the Four Noble Truths into the analytical system, and to extend the vision in profound and diverse ways. Moreover, the villagers already possessed basic knowledge gained from public information, government campaigns and self education about the pollution of the river and that it was caused by improper waste

disposal. The research team proposed to find the solution to the problem by using rational analysis together with the basic knowledge on environmental impacts to comprehend the rational correlation between dumping waste and river water pollution in addition to preventing and solving water pollution problems. The final result was a substantial practical guideline where community members gathered together to participate in the work on a continual basis with a clear understanding of what needed to be accomplished. The research team reached the conclusion systematically and without confusion, i.e., the villagers were able to write down a plan to solve the problem that addressed directly at its root cause.

According to the table of correlation between the Four Noble Truths and the solution to the waste problems below, it was found that the root causes gave rise to suffering. Suffering is a state contradictory to the cessation of suffering, and the path to cessation of the suffering were used to manage the causes, thus leading to the final elimination of suffering itself, which is the core principle of sustainable problem-solving. The details are described, as follows:

**Table 4.1 :** Analysis of the application of the Four Noble Truths for problem-solving

<b>The concept of the Four Noble Truths</b>		<b>The Concept of Waste Management</b>	
<b>Four Noble Truths</b>	<b>Actions</b>	<b>Facts</b>	<b>Solutions</b>
Suffering = suffer, discontent, have problems.	Must know	Water and environmental pollution causes suffering to the villagers.	Must learn about the condition and the cause of the problem.
Causes = the origin of the suffering, or problems.	Must abandon	The causes of water pollution, and environmental degradation.	Must get rid of the causes of water pollution, and environmental degradation.
Cessation = cessation of the condition of suffering	Must realize the cessation of suffering, make it happen and once achieved must try to sustain it.	The condition of non polluted water, no degrading of the environment; people satisfied.	Must make the river not polluted, and environment not degraded. Prevent the causes, and learn about the condition when the river and environment are not polluted, and set the goal that must be achieved.
The way to the cessation of suffering = the path leading to the cessation of suffering.	Nurturing (practice to arrive at the expected goal)	The method to make the river and environment unpolluted.	Must strictly follow every step of the procedures to achieve the goal.

Solve the problem using the participatory research process, adhering to the concept of a triangle moving a mountain, combined with the principles of the Four Noble Truths, so creating a better, more effective method. From a participatory process in learning and analyzing problems in the suffering stage, to finding the causes of the problems in the causes stage, which was conducted by studying the lifestyles related to waste, new knowledge was derived from exchange of thoughts, and establishing the intended objective in the cessation stage, and finally participatory planning and practice, including evaluation in the path to the cessation of suffering stage. Participation in this problem-solving process initiated the gathering together of the villagers to join forces to resolve their own community problem. The participation of the community, by propagating the results of the 40 leaders was regarded as the start of the triangle that could move an increasingly bigger mountain. This gathering of the stakeholders--the villagers, community organizations, local politicians, community leaders, and local government officers--led to very effective problem-solving methods.

Multilateral participation is the major strategy for sustainable community problem-solving. In this study, the research team found that joint participation in problem-solving had proved the theory of “a triangle that can move a mountain” to be true. The combination of the three components i.e., knowledge, social movement, and local political linkage resulted in observably greater driving force and success in problem-solving than if conducted unilaterally. This research was able to draw upon the strengths of the villagers, community leaders, local government officials, and local politicians to tightly work together.

### **3) Practicing, perceiving, and learning of new knowledge**

The participation of the people in the Tupperng community was an important undertaking in initiating the participatory learning process. This process led to activities and knowledge exchange among the diverse group of participants in terms of age, gender, social status, education, position, occupation, encompassing those in all echelon of society. Moreover, what had been learnt was the result of the amalgamation of different visions of the environment, the varied lifestyle and the may problematic situation, which all led to a common objective of understanding and caring for the

community. These processes ignited the public consciousness or realization of their mutual fate, the value of interdependence and a common goal, leading to participation in self-dependent problem-solving.

#### **4.1.2 The stakeholders' aspect (40 leaders of the research team, and the villagers)**

If the word “co-operation” refers to the process of having many people working together using their labor, or of sharing together their ideas, it might be said that co-operation have existed in Tupperng for a very long time. This co-operation took place amongst the villagers in the community, such as in assisting each other in growing tobacco, in plowing fields, in merit makings, etc. In similar manner, this participatory problem-solving regarding waste management was considered to be an across the board participation by everyone who were willing to take part in. They all had a common goal to make life better and to live without duress. The participation was based upon equality, because it was a co-operation within the community and not from outside. The participants were the people in the community or living in the same locale. The affects to the community generated by this participatory approach can be described as follows:

##### **4.1.2.1 Diversity of the leaders' potential (the amalgamation of ideas, experiences and vast resources among the chosen 40 leaders that comprise the research team)**

The diversity of the research team in terms of back ground, live experiences, and the encompassing knowledge on local wisdoms was never an obstacle to the problem-solving process. On the contrary, it proved to be a benefit to the program and even contributed to greater co-operation and unity within the group. Since all the team members are not total strangers to one another, with even some of them being relatives and close friends, the overall atmosphere were that of unity, encouragement and co-operation with the same motivating factor and that is to address and remedy the river water pollution problem the village was currently facing.

This research project created opportunities that never existed before in bringing people from different places such as those from local government, local politicians as well as the villagers themselves to come together in a level playing field where no one is higher or lower in stature or significance and to work together step by step in order to come to reach for a common goal. In this particular setup, it is observed that local government officials as well as politicians who tend to think of themselves of higher stature than the villagers and usually had their own accustomed mode of operation had to make a self adjustment in order to be working in conjunction with the villagers.

*- Participatory roles of each party*

The participatory process in this research had created “leaders” in the community. Abbot Direk said: “Once born, one should contribute to one’s hometown”; these simple words touched the hearts of all the group members and encouraged them to participate in every process without any hesitation. An analysis of the participatory roles of the various stakeholders is presented, as follows:

*- The people who played the leader’s role*

The reasons for them assuming the leader’s role are as follows:

**- Gaining present and continued benefits**

The community leaders who participated in this project played the leader’s role because they immediately benefited from the project and will continue to do so in the future as well. Generally, some of them were already made responsible for solving the waste problem of the community and once the research project was introduced, these leaders could continue to play their roles with additional help from the team members making them becoming more visible and respected within the communities if they performed their roles well.

**- The basic potential of the leaders.**

The selected leaders are people highly respected by the community for having contributed their time and effort working for the benefits and progress of the community without any hidden agenda. They are competent and knowledgeable in many respects and command a great deal of recognition and support from the villagers.



They all had extensive experiences in group activities, community planning and development and had been in these positions on a continual basis for a significant length of time

**Table 4.2 :** Classification of the attributes of the 40 leaders according to their participatory roles

Reasons to assume a leader role	Continued benefit	Basic potential for being a leader	Long experience in social work	Have endurance and willingness to participate
1. Leaders	✓	✓	✓	✓
2. Followers	✓	✓	-	✓
3. Limited role people				
4. Opposors	-	-	-	✓
	-	-	-	✓

The people who played the leader roles in the research group were as follows:

1. Pooyai Ban (the village headman), Poochuay Pooyai Ban (the assistant village hadman)
2. The public health officer of the subdistrict
3. The monk (the abbot of Wat Tupperng)
4. The teacher

- *The community leaders (the village headman, the assistant village headman)*

All of the community leaders of Tupperng come from the local area. The village headman had a broad vision and was a community developer. He used to work in public health as a public health volunteer and did volunteer work for many other organizations. Therefore, he processed a lot of experiences and a wide perspective in community development. He willingly participated in the research team because he could foresee the benefits coming to the village. He played a leading role in soliciting assistance and co-operation from other organizations and their people because of his good rapport and respectable tract record. He is being held in high regards by other people.

Pooyai Somnuek, Pooyai Srisamutr, and Pochuay Somchai had performed very important roles throughout the research project. Pooyai Somnuek was voted chairman of this research activity. Besides taking care of all the logistics such as arranging meetings, making announcements, providing drinks and snacks during meetings, he more than often contributed useful ideas and make sure that their resolutions are made known, understood and actually being implemented far and wide by others.

The community leader group comprised of leading people in the community that command respect from the villager. The Tupperng community was fortunate to have had strong leaders to play very important roles in driving the research project. Khun Boonleua Puangjan said that “Pooyai Nuek is an intelligent person. We can ask for advise on all matters”. The important thing about the Tupperng community leaders was that they had profound understandings of the local community. Furthermore, they were masters of public relations allowing the waste problem-solving activities to progress on a continuous basis. At the same time, these community leaders did a superb job in stimulating the villagers to dispose of waste regularly by reminding them via announcement made through loud speakers located at the village headman’s house.

*- The sub-district public health officer*

The public health officer worked in the community and was one of the few persons to get closest to the villagers. The villagers respected and believed in him because he is the person they depended upon when they or their family members become ill.. The researcher knew him personally and has worked together with him on prior public health development program activities. The public health officer was quite delighted to be able to work together again and fully cooperated at every stage of the research work on the waste disposal project in Tupperng.

Khun Prasit Niamkamnerd (the public health officer of Health Station, Tupperng Subdistrict), possessed an excellent skill in human relations, who could easily talked to the village headman, the public health volunteer, the senior citizens, the young people, the housewives, and just about anybody in the community and gain their full

attention. . He had known this community since he was born, his participation in the activities came naturally without any disguise. Therefore, he could play the leader's role effectively and in conformity with the objectives. His specialty was in environmental health and he was well versed in the technology used in environmental management. He participated in various community activities, such as building latrines, molding water jars as well as making efforts in uplifting household sanitation. Before meetings, he would help out in preparing foods, arrangement of mats, tables, chairs, and helping other group members. He was expected to be the next leader of the group after the researcher had left the community because of his proven skills in group management.

*- The monk*

The abbot of Wat Tupperng, Abbot Direk, played a leader's role in introducing the Four Noble Truths to solve the community's problems. He was a major contributor in planning and helped to guide discussions not to stray away from the main issues.

Abbot Direk was strict in practicing Dhamma, and an avant-garde social developer at the same time. He had many disciples. When he became an abbot, he initiated many useful projects for the community, for instance, a school lunch program for poor children, the teaching of Dhamma in schools as well as to ordinary people. Abbot Direk was always a leader in every research activity as he became more familiar with the researcher, his interest in the research topic increased. He convinced senior citizens in the community to join the research team because they are the ones who usually came to the temple more often than other groups. The other minor group was the housewives who came to cook food and to help prepare ceremonial rituals.

Abbot Direk had extensive experience participating in various development projects. He mentioned that this project is totally different from other projects that he had seen come and go as soon as the training officer left the village, there were no continuation nor any follow up of any kind. Nothing ever resulted from them.

He witnessed the suffering in society and realized that a monk's duty is not just to preach in the temple. The monk's duty is to work for the villagers; he said that Lord Buddha himself used to stay amongst the villagers and had the food that they offered. His own goal was to work to solve the social ills of the villagers and to release them from the cycle of birth and death. Accordingly, he joined the project and introduced the Four Noble Truths to guide problem-solving. He was a leader who could clearly explain the principles of the Four Noble Truths. He always motivated the team to solve problems with wisdom. He was fully convinced that the principles of the Four Noble Truths, although discovered more than two thousand years ago were still the right and most practical approach to be used in solving today's problem

*- The teacher*

Teacher Panida Seuklin was a local teacher and wife of Pooyai Srisamutr, or the head of village 8. She was willing to join the research team because of her pro-development believes. She was usually a leader in village development programs, and was well respected by the villagers as she knew many people and had many present and former students. Whenever she asked for cooperation, people would be more than willing to help out. Sister Thongkham said, "Teacher Panida usually initiated group activities, such as broom making and clothes making but the effort was not carried on for long since the group members could not find time or their interest waned out" She was able to convince the younger people to participate in the research team since most of them were her former students. Sister Dam said, "The early initiator was teacher Panida. She is a nice woman, knowledgeable, and we participated because we all would like to work with her."

In group activities, she played the leader's role in formulating ideas, and always spoke up first. She also motivated the group to express their own ideas. Teacher Panida played the role of an academic with experience in community development, who had a sharp vision and was forthright in her various presentations and communications.

Teacher Panida Seuklin was a research team member with obvious developmental potential. She had long experiences in the community as she was one of the locals person and had intimate knowledge of the villagers. She could interact and help the villagers at all times, while the villagers were familiar with the school and helped to improve it because they felt that the school was an important part of the community. She created good understanding by introducing participatory techniques as a tool in performing activities to suit the villager group. She was able to organize community based projects in areas such as food preservation by the housewives, earning extra household income by seeking extra outside work and organizing youth sports activities creating closeness between the school and homes. With this connection, teacher Panida had ensured participation by the housewives and youths in this research as well.

The people who played the leadership role that impacted the continuation of the project which directly linked to the sustainability of the project. Details of which will be further described in item 3.

### **The followers**

The people who played the follower's role in this research were:

1. The housewives
2. The sub-district organization administration members
3. The public health volunteers

These people expressed their opinions on various issues conforming to their prior experiences. However, in many cases they just merely followed the leaders.

#### **- *The housewives group***

This was a local organization that originated from a network of relatives. The members meet up regularly and participated in the research team at the solicitation of the group leader. Typical of Thai families, the women played a very important role, although behind the scene, they are actually the strength and pillar of the family in many instances, its driving force. They are empowered to initiate and carry on many activities in their household and in the community itself.

The housewives were kind people willing to make things better. Their participation helped motivate other villagers to manage their waste effectively.

These representative housewives played an important role in this research by shedding light on the behaviors related to waste generation and disposal, contributing useful ideas and future vision derived from their own direct experiences in community development. One important aspect was that they were able to propagate the findings to be implemented by other family members and their neighbors. Their nature of getting together to chit chat amongst themselves proved to be a very effective means to spread the word about the research findings and recommendations around in the community.

In essence, they contributed most in data gathering of community behavior patterns when it comes to current waste generation and disposals. Since they themselves are instrumental in various food preparation activities both in their homes, at the temple and other places, they knew full well about waste issues and how to properly manage them. Not being only a preacher but a practitioner of appropriate waste management, they are considered an important ingredient in the continuity and sustainability of the overall undertaking.

***- The subdistrict organization administration members***

The sub-district organization administration members were the grassroots politicians, the local politicians whom the villagers trusted and elected to be their representatives in community management. They were very close to the villagers, and usually joined in most of the village activities in order to maintain their popularity and get voted into office again when the next election comes due. The members of the sub-district organization administration participated in the research team, and presented the problems the villagers were facing and their respective inputs. These local politicians also took part in expressing their own ideas that will benefit the community.

Participation in this research was regarded as an opportunity for them to work for the people they represented. The sub-district organization administration understood the needs of the community well and played an important role being the political

linkage, one of the three components that comprises the triangle mentioned in the theory on “the triangle that can move a mountain”.

*- The public health volunteers*

The basis function of the public health volunteers was to provide the linkage between the villagers and the public health officer. They generally convened a meeting every month to get updated on matters related to public health and the delivery of these important messages to the community.

Their participation in the research team was regarded as important, because the public health volunteers were the ones very close to the problems of the villagers. They knew about the health impacts due to the deterioration of the environment more than any other group and therefore were able to play an important role in organizing group activities to implement proper waste disposal solutions.

*- The senior citizens group*

The senior citizens group was a unified community organization, with clearly driven activities. These people played important roles in developing the Tupperng community. They were leaders in organizing religious ceremonies, merit making ceremonies as well as other cultural ceremonies: for instance, the Kathin ceremony, the Tod Phapa ceremony, the Tamboon Klang Ban ceremony and the annual ceremony of the Wat. They led in conducting the ceremonial rituals for the village. Furthermore, they were eager in suggesting useful ideas that will work well as well as reasons for past failures and lessons learnt, as they had more experience than other people in the community. They were the sources of local wisdom and were usually asked for advice. They expressed true admiration for applying the Four Noble Truths in problem-solving, because they were familiar with the principles.

The participation of the senior citizens group in the research team enabled the team to benefit from past experiences both success and failures. They advised the team about the changes in the ways and styles of the people that occurred as time passes. How people lived when the environment was still pure and untainted, when the river

water was clean and when waste and pollution were not a problem like today. The vision of yesteryear motivated the community to seek solutions to remedy the current situation and gain back these long lost virtues

### *The opposers*

The people who frequently had opposing ideas were as follows:

1. Sub-district agronomist
2. Some of the housewives

The Sub-district agronomist had just moved into Tupperng, and he therefore usually spoke about his experiences in the previous sub-district that he came from. Many a times it turned out to be opposing to the majority view, but luckily it always ended up in consonance among the group members after the group had a chance to deliberate these opposing views among themselves.

### *Limited role people*

The leader of the youths was one person who had fewer ideas in the group. Although he was encouraged to express his ideas, he seemed more reluctant which might be from lack of experience. He finally had the tendency to go along with his elders in the end.

#### **4.1.2.2 Changing ideas, from belonging to the government to belonging to us**

When the researcher was first introduced to the community, the villagers thought that the project was just another official meeting. Some of them thought that the government had to get involved in the project because the Tupperng people were familiar with numerous government initiated projects implemented in the area. The major force for all of the previous projects were government officials, and most of them involved training. Villagers would be recruited to be trained; some gained something while others did not. The “officer” had always played a major role in community development and the villagers had never taken part in or have a sense of owning the project. The villagers were merely like puppets for the government to put a thing called



“knowledge” into them hoping that later on they will be able to put it to good use. These officers were also instructed and directed by their respective bosses higher up in the chain of command. The villagers were never exposed to systematic thinking, project planning or project budgeting. Therefore, not surprisingly once the “project” ended, the problem never went away. In certain situations, the government made the problem worse by repeating what they have done before together with their inability to garner cooperation creating further confusion among the villagers. In addition, almost all of the previous projects were not customized for any particular community but a general one for all communities alike, as it turns out a number of them are not needed by the Tupperng community.

These government run projects were not made in accept inputs or feedbacks from the communities, and therefore any suggestions by the villagers were summarily blocked or ignored. The idea of the community owning the project never existed before.

The introduction of the research team became the origin of community based independent project undertaking. The research leaders indicated that the government should stop doing the talking, thinking, planning for them separating them into groups and parties and in essence, treating them as a child as if they knew nothing. This particular research project had a totally different approach where it made the people who live with the problems on days on end play the major role by giving the right tools and methods in analyzing and solving their own problems in their own way. The researcher turned them into becoming the sole manager of the project. They were able to schedule their own meetings for brainstorming sessions, they could speak their minds and get into discussions freely among themselves to reach resolutions of pending problems. Since these answers to the community problems were “home brewed”, it signified a drastic deviation from the past, namely, the notion of a “government run project” came to become “a Tupperng community run project” instead, a sense of ownership that will lead to sustainability is therefore created.

#### **4.1.2.3 The group's influence (the unifying power inciting the community and local politicians)**

The gathering of 40 local leaders of the research team to solve the waste problem in the community, the mapping, the investigation of waste disposal behavior, and the planning, had caught the eyes and the attention of the local people in the community. The people were interested to know what these people were doing. News of the leaders coming together to solve the community's waste problem had spread throughout the community by word of mouth, from the team members to family members, and from one families to another like wild fire.

After the research team had reached a final resolution then it was ready for them to announce the findings to the community to be implemented as soon as possible.

The whole implementation strategy was not to forcefully impose the findings on the community but to have the members of the research team act as "trend setters" for others to follow. Due to the fact that all the research leaders are respected individuals in their own turfs, they all command a certain amount of admirer turn follower of their own. The village headman and his assistant, the abbot of Wat Tupperng, the teacher, the public health officer, the public health volunteer, the senior citizens, the housewives, initially started practicing what they preached by setting examples of what a non-polluted environment looks like in their homes and living spaces. Once that becomes obvious, their followers then wanted to mimic the nice surroundings in their homes as well leading towards a community wide implementation that eventually transformed the whole village in a remarkably short period of time. As it turns out, the last group resisting change were people in the lower social status such as market venders and school janitors who mistook the change as additional work that has to be performed. Once they came around and realized the benefits and fearing to be the black sheep of the community, they eventually cooperated and had a change of heart.

The local politicians played an active role in the research effort as well since they will be working together with the community leaders who had a lot of influence over the individual voters. Moreover, this important movement was directly related to

the responsibility of the sub-district organization administration; for instance, in taking care of cleanliness of the village, the prevention and elimination of any troubles and unwanted annoyances, and the uplifting of environmental sanitation. It was no surprise that the local politicians were eager to serve the needs of this group to ensure their standings in the community and to potentially secure future votes.

#### **4.1.2.4 Application of local wisdom (original local wisdom can solve problems; different ideas provide options in problem solving)**

Participation in the research process allowed the villagers to learn new things together. This was the result of exchanges of information, open unbiased discussions, presentation of facts, sharing of personal experiences as well as the expressing of personal opinions in a democratic way and the willingness to listen to others. Throughout the process to reach a noteworthy resolution, the atmosphere were of friendliness and supportiveness. In the end, the Tuperng leaders were able to fully use their combined knowledge on local wisdom to come up with solutions to take care of the disposal of the waste. They spent time analyzing the problem and was not in a hurry to come up with a solution that was not well thought out. They paid great attention to past behavioral patterns in dealing with waste generation and disposal. Much to their surprise, they found things that were overlooked or neglected before. The application of the familiar Four Noble Truths that they all have heard in schools, in sermons at various religious functions finally came to light and was applied to identify the root cause of their woes associated with the handling of waste in the community. They finally came out with the recommendations to dig seepage holes, make waste disposal pits in their own backyard, and to make compost from the household organic waste generated. These findings were the result of a carefully thought out process combining new ideas together with old ones and using their respective command of local wisdom and past experiences to the fullest. In other words, the sharing ideas and experiences among the villagers constituted the “knowledge” component in one leg of the “triangle that can move mountains”.

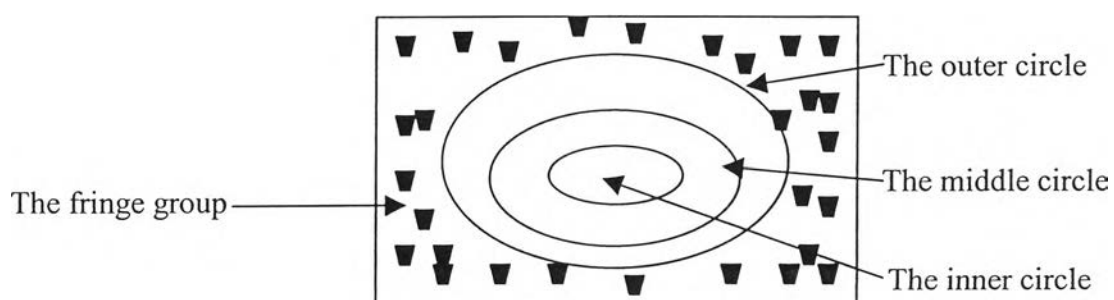
#### 4.1.2.5 Originating network, and spreading the word out (using word of mouth and example settings)

The 40 leaders were able to spread the resolution around merely using word of mouth. Skilled in verbal communications with no need for high technology devices, they are able to convince those near to them to adopt the methods discovered and perceived to be the best solution to address the community waste disposal problem. This personal two way communication proved to be the most effective method to spread the information throughout the entire community.

It can be said that the success in making more and more people in the community understand the benefits of having a cleaner environment and a much better place to reside such that it reached a point where everyone took it upon themselves to not only just know the theory but to actually put it to work was the result of example setting that started at the core of the network of people, namely the 40 community leaders. If we were to look at this network of people involved, we can loosely classify them into 4 groups or as layers starting at the core and expanding outwards as follows:

The core group: the research team was at the center of the movement.

1. The group in the middle circle: people who were not able to provide extensive help, but when they had time, they came in on their own and were willing to chip in.
2. The group in the outer circle: people who would come to help only when called upon.
3. The group on the fringes: people whose actions were not clear. They were only interested to know and see how the project progressed, in other words, these people are sitting on the fence and not actually participated.



- *The inner circle (core) group* was the 40 leaders of the research team who worked together to study the problems, to find ways to solve them, practice, spread the results out to others, and evaluate the success of the project in order to make additional adjustments along the way on a continuous manner.
- *The group in the middle circle* was the family members of the 40 leaders who always stood closely behind the leaders. They regularly participated in the group's activities. These people attended the meetings, go get the research leaders if he/she happened to be absent and even help take notes of the meetings. They usually would not speak up in the meetings but expressed their ideas once the meeting adjourned
- *The group in the outer circle* was the neighbors who lived in the vicinity of the 40 leaders. They received the information directly from the core group of leaders. They are the ones interested about what was going on and are first to understand the objective of the movement. After they saw examples being made by the core group, a number of them caught on quite quickly and follow suite, some had initially hesitated but were later convinced and the remaining did not follow suite giving reasons of lack of time.
- *The fringe group* was composed of people living far from the riverbank as well as those who even lived further away along the boundaries of the community. They were the ones receiving the information later than the others and usually lacked detailed information. They usually had nothing to say much about the movement and remained undecided although some did expressed their opinion that neighboring communities should take up the effort as well.

The networking within the community in Tupperng had the characteristics similar to a spider web. The research team was at the center of the web. One member of the team may have many connections with a lot of people. But the people who had broad connections both inside and outside the village were more instrumental than

those with only local networking, such as the village headman, the sub-district administration organization members and the village health volunteers. It might be said that most people in the village were in one manner or another related to each other and therefore knew each other quite well. This personal familiarity facilitated the group discussions by creating a supportive atmosphere.

#### **4.1.2.6 Originating useful activities for the community (the multilateral group created *tangible outcome*)**

The research team is structured as a multilateral group working together. They all operated as partners and stakeholders of the community. All of them participated in finding solutions to the problem on an equal footing in terms of having the same rights in expressing ideas, taking votes, making comparisons of the pros and cons, etc. Everything is done in a democratic way. The final resolution was truly the byproduct of concerted efforts and teamwork from beginning to end.

The tangible results obtained from the research program as stipulated by the core 40 leaders can be described to be the introduction of the practice of waste separation, the building of seepage holes, the building of waste disposal pits and the practice of non-dumping of waste into the river. The examples set by this core leader group made converts of those next to them. These second group in turn were successful in creating additional followers and the circle kept expanding further and further as more people were made aware of the benefits of having a healthier environment and realizing that they can make a difference by themselves and not needing to rely on anybody else including the government.

**Sustainability of the project = the researchers' facilitation + community action + lateral group impetus + perseverance + stability**

## **4.2 The Key Ingredients that Lend Itself to the Sustainability of the Project are as Follows:**

### **4.2.1 Researcher played the role of a mobilizer**

Although an outsider in the beginning, the researcher made extreme efforts to assimilate himself into the community until he finally became very well received and accepted by the whole community. In guiding the research project, he silently mobilized the 40 community leaders and were able to developed their respective potential to the fullest. He acted as a catalyst by ushering new approaches in addressing the community problems and done in a more systematic way. He was successful in extracting the local wisdom that each of the core participants had and allowing them to arrive at the solutions fully content that these solutions were well thought out amongst themselves and not being enforced by any outsider or being directed by the government like it used to be before. This self ownership is an important component that lended itself to the sustainability of the project

### **4.2.2 Community participation (*allied together, helping each other, working as a team*)**

The researcher had applied the techniques used in participatory research as a tool to enable the villagers to use their own capacity to analyze the problem, and find ways to solve these community problems according to the well-known Four Noble Truths principles. This was basically a confidence building process for these 40 leaders had never realized before that they already had this problem solving capability in them.

#### **- *Comfortable, simple and relaxing group participation***

The logistics do play an important part to the success of the research project. Considerations had to be given in many aspects such as the timing of the meeting, its location, its scheduling, its duration, its agenda or purpose has to be made known before hand, etc, in order to make it most convenient and most pleasant to the participants. An example would be that these meetings had to be scheduled in the late afternoons or early evenings after all the daily chores such as watering plants, etc., had been taken care of. The typical meeting places would be at the village headman's

house, the community store, the temple, i.e., places where it was open for anybody to walk in and join the discussions. Regarding the format of the meeting, one had to pay a great deal of attention to make sure that it is congenial and friendly, conducive to the free flowing of ideas and information. These meetings were not supposed to be stressful, on the contrary it must be relaxing and enjoyable similar to having a large family get together. Having all these factors in place would guaranty continued participation. It was found that one of the motivating factor for people joining in was to also enjoy the food that was being prepared for the participants by the housewives who themselves did not mind performing the task of preparing it since it allowed them to get together to do their normal daily chit chat as well.

***- Speaking the same dialect encourages participation***

The ability to use the local dialect in their communication was very important to encourage the people to participate in the meetings. The villagers talked and expressed their ideas freely and frankly without any hesitation, because they used the same dialect that they commonly use in daily life. In addition, the researcher himself spoke the same local dialect and could therefore blend himself in seamlessly. This particular setting is rather unique because in typical government sponsored projects in the past, the official sent by the government to “educate” the villagers almost all the time communicate with the locals using the central dialect making it harder for many villagers to understand at the onset.

***- Enjoyment factor attracted participation***

One factor that made the people participate in the project was the enjoyment of group participation. The nature of the Tupperng community was that they liked to have fun--singing, dancing, and talking in groups. The waste problem was important, but not at the top of the priority list for them, unlike other problems such as preventing the spread of dengue fever, the drugs problem, or the Avian flu epidemic. It may be because, they believed that they could manage the waste problem by themselves, something within their own reach. The format for each meeting was to start with the activity to help in “building relationship” amongst the participant and that is done by game playing which turned out to be quite popular because there was quite a lot of fun



involved. In many instances even when after the group activities were completed, people still hung around and did not want to immediately go home. It was typical to see a male leader kept on singing his karaoke showing off his style to others and thoroughly enjoying himself. When it was absolutely time to leave, they would tease each other in a friendly manner.

### **4.2.3 The three components of “the triangle that can move mountains”**

#### **4.2.3.1 The components of local political linkage**

##### **- *Sub-district Administration Organization***

One of the government assigned responsibility for the Sub-district Administration Organization was to look after the cleanliness of the community making sure that garbage are being disposed properly at the designated places and not thrown out carelessly all around. It had to oversee the collection and the systematic disposals of waste. They have the power to issue ordinances pertaining to the prohibition of garbage dumping in public places, the distribution of garbage containers. It also had to take care of improving the quality of water resources, the proper maintenance of public latrines, ash containers, etc., making sure that they were not breeding grounds for disease carrying mosquito. Therefore, it was quite obvious that when the research project came into being, the sub-district administration organization saw it as a great opportunity to garner help from the community and not to have to do these tasks alone all by themselves. It behooves them to cooperate and fully get involved in the project right at the beginning.

#### **4.2.3.2 Components of knowledge construction**

##### **- *Health station***

The public health officer in Tupperng Sub-district was an important leader to participate willingly in this project, he convinced all the public health volunteers to join the team, as well. The public health officer had direct responsibility in giving advice and solving health related problems in the community. Participation in this research had benefited all of them as well in terms of being up to date on what is progressing in the community and being able to actively contribute ideas and share experiences.

Khun Prasit Niamkamnerd who is the public health officer responsible for the Tupperng community is a person well versed in public health laws. He was able to give valid recommendations to local government officials and the sub-district administration members in the use of power related to the issues. If any environmental health problem occurred in his area of responsibility, or any action taken was against the public health law, he would immediately inform and advise the local official. In addition, he personally took it upon himself to help out in the logistics of the meeting as well, in setting up the place, in food preparations and other routine activities. He was also very active in group activities, a true facilitator in every respect. He was definitely one of the key players to carry on the effort and make sure that the project does not die out once the research left.

- *School*

Typical of local Thai communities, the school is one of the places that people congregate to besides the Wat. It holds a high prestige in the community as a place of knowledge and learning and so does the teacher. Our particular teacher volunteered to organize a waste bank at the Tupperng school in her hopes to foster awareness in having a good environment among the students and to use these students to spread the word around the community by setting examples in their respective households. This actually proved out to be a very effective means to accelerate the rate of adoption and implementation of the solutions proposed by the group of leaders. She certainly was another key player to ensure the sustainability of this project, her contributions and noteworthy suggestions during the meetings clearly made her stand out from the crowd.

#### 4.2.3.3 The community and social components

- *Wat*

In a predominantly Buddhist community such as at Tupperng, the Wat plays a major role as the center of all communal activities. It was a place where the villagers would come gather to join forces in providing free labor to the numerous construction projects the Wat had. Many of the outcomes were considered to be the pride and joy of the community. They also came to engage in religious ceremonies on weekly and special occasions either on personal or on nationally designated religious holidays.

Wat Tupperng was historically a part of the community for many generations and its current abbot is Abbot Direk who is much revered by the community because of his true devotion to uplift the standard of living of the community as well as their spirituality. He frequently used the occasion when the villagers gather in numbers at the Wat to teach them Dhamma and in particular the Four Noble Truth which is the foundation of Buddhism. His candid, clear, simple and precise explanation of the teachings of Lord Buddha was well admired within the community and since the research project hinged heavily on using this Four Noble Truth concept, Abbot Direk did come in very handy.

Logistics wise, Wat Tupperng has a large temple, a perfect meeting hall, more than adequate parking spaces and located in the center of town making it quite easy for the villagers to go to.

Because of Abbot Direk's high and respected standing in the community, whenever he talked, people listened. He therefore proved to be another perfect source to effectively spread the words out on the findings and recommendations of the group leaders. He sincerely believed that Wat Tupperng played a very important role for the community, it cannot exist without the support of the community itself and vice versa.

#### **4.2.4 Research Group clearly comprehended the problem (Knowing the problem in depth; cause and effect)**

##### ***- Insiders had in depth understanding of the problem when outsiders did not***

The typical mode of operation of a government sponsored project to supposedly impact the community is to recruit the villagers to come in to listen to lectures by "experts" in the field. The instructor would present one or a series of lectures and handing out brochures and notes that he had prepared ahead of time. The materials were basically pre-packaged for the general audience and not designed or customized for any particular village. Little or no study was made to understand the actual needs of the particular community. Therefore, most of the time the information was irrelevant to the community that he is making the pitch to. More importantly, the presentation was usually made with the attitude of "father knows best". The instructor felt superior to

the villagers who usually refers to him as “master” which aggravated the situation even more. These official instructors paid no attention to the local wisdoms within the community and had the tendency to look down upon the villagers misleadingly by thought that they were a group of uneducated people that needed to be taught in a typical classroom environment. On the contrary, these villagers had the succinct knowledge of the problems, social attitudes and behavior of their own community. All of these needed careful attention when trying to solve any impending community problem. So it became quite obvious why the success rate of government sponsored projects were so low and a good record of continuation for any decent period of time is almost unheard of. The villagers were proud people although not highly educated in the traditional sense but they gained their knowledge through their life experiences and having their feet on the ground and their hands dirty. It is truly a testament that knowledge could also be gained by doing things and not by just learning from books and lecture notes

***- Perceiving the problem correctly led to the discovery of appropriate solutions that conformed to the local situation***

This project focused on the integration of the community’s resources, studying the problem and its causes, making decisions based upon the most pertinent and practical guidelines, the mobilization of everyone to practice problem-solving. The villagers’ problem was not the researcher’s problem; hence, they had to manage it together by themselves. The researcher merely acted as a facilitator by letting them think, make decisions, plan, and conduct the operation using their own potential as well as limitations. The researcher directed the group in a very subtle manner by providing them with the right tools and made suggestions when needed to overcome deadlocks or to get over certain obstacles.

Solving the waste problem by group discussion, to find the model solution, guided by the principles of the Four Noble Truths, revealed that the research team paid attention to observing waste disposal behaviors closely, as they had never done before. This led to finding the root cause of the problem and the initiation of a specific problem-solving method by the group that could produce appropriate and sustainable

solutions, conforming to the local situation. Somnuek said, “Every household had sewage water at the back of their kitchen; it’s easy to dig a seepage hole to hold the water”. Thongdam said that “If we stop lending money from the village fund to the people who dump their waste into the river, there wouldn’t be anyone who’d dare to dump any waste”. This revealed the perceptions of the villagers’ problem.

#### **4.2.5 Self-belief in problem-solving (confident, solving the problem using local wisdom)**

After the research project ended, the villagers themselves would carry on the things learnt from the waste management study. The recommendations and implementation methods were simple in nature with no technical complexity involved. The monetary costs were minimal and the investments were mostly in time and labor. Examples would be in making a seepage hole, digging a waste disposal pit, performing waste separation, and not dumping either solid or liquid waste directly into the river. These activities could be easily conducted in harmony with the Tupperng lifestyles. People in the community were able to take part in accordance with their own abilities. The result of these simple activities that the 40 leaders and the researcher initiated was like throwing a small stone into the middle of a large pond where the splash caused a vast rippling effect expanding in all directions reaching towards the shore. It truly produced a pronounced effect in making the community a better place to live in. Waste management using local wisdom increased confidence among the villagers which fostered continued participation at the household level. There were other add-on things that the villagers could do by themselves, such as planting trees and shrubs to absorb polluted water, making a drain from the household to the orchard, feeding waste to animals, recycling waste, putting signs up to prohibited waste-dumping in many areas, issuing rules, regulations and penalties for the community prohibiting the dumping of waste into the river. The fact that the Tupperng villagers initiated the program by themselves, worked throughout the thought process to come up with solutions and remedies for the waste problem, they basically have ownership over the whole process which is the key ingredient for the sustainability of this unique undertaking.

#### **4.2.6 Public awareness (love the hometown, respect for mother nature, filial devotion to the river)**

The outcomes of the project were evident from the changes that took place, not only that they were able to offer better and cleaner vistas along the Yom riverside, but they also had a deep psychological affect on the Tupperng people as well. The villagers had gained a much greater awareness in keeping the river clean. They had become more confident and united in their cause. Abbot Direk, the spiritual leader of the Tupperng community and a far sighted monk who spearheaded many community development efforts in the past usually said that, “In one’s lifetime, we all should do something for our hometown”, this simple statement helped mobilized participatory power within the community.

There is a saying that a mother has the greatest kindness and encompassing virtue, of which its enormity can never be fathomed , similar to the river. The Tupperng people admitted that they had treated the river badly before and had significantly “wounded” the river but the river had never complained back. From now on, we, the Tupperng people would come to apologize and give thanks to the river, not only during Loy Krathong Day or Tamboon Klang Ban Day but everyday. We will from now onwards make a commitment not to pollute our beloved river. The villagers felt greater love and appreciation of the river. They cherished the river exceedingly more. Contemplation of past practices of waste disposal behaviors imposed upon the river made many people felt remorse and regretful than ever before. Suchin said that “The river had to accept just about everything we threw into it. If the river could scold us, it might have done so a long time ago. We had treated the river very badly as if it were a scapegoat for all of our misdeeds.”

#### **4.2.7 Behaviors create social change (leading, supporting, changing the society)**

It was found that the selected 40 leaders that comprise the research team are people that the villagers truly trust and believe in. They all are masters of persuasion and has conducted themselves as role models by trying out first what they have discovered before encouraging others to follow suite. By creating a cleaner

environment where there are no water pollution nor foul smell, these leaders are instrumental in propagating the ideas and effort throughout the village. They take it upon themselves to personally and consistently oversee and facilitate the implementation by other villagers and did not relegate anyone else to take over those functions.

One important observation made in Tupperng as a result of the resolution that came out from the 40 leaders after their many brainstorming sessions was a declaration saying that anyone who gets caught dumping garbage into the Yom River will be severely reprimanded and not get any further support from the community, thereby being somewhat ostracized from the community itself. Since these leaders are influential and respectable people, their unified voices triggered a significant change in the social behavior of the ordinary people in the community. The dumping of waste materials into the Yom River reduced dramatically as can be seen during the Avian flu endemic in Sukhothai that killed hundreds of thousands of chickens. The practice of dumping chicken carcasses into the Yom River was observed in communities elsewhere but none was found in Tupperng sub-district although the flow of the Yom River at the time of the year was rather slow reaching the point of stagnation. Any dumping would have been easily detected due to this almost non-flowing water condition. This clearly showed the change in attitude and social behavior that resulted from attempts within the community itself under the initiation and direction of a group of influential leaders who were able to come together to galvanize the local population into seeing the pros and cons of having a clean riverside environment versus having a polluted one. They therefore took appropriate actions into their own hands without interference from outsiders or any government body creating a sustainable and long lasting social developmental change directly benefiting their own community

## **Part 2 Research Results in three Phases**

### **Phases I Study lifestyle of riverside community**

#### **4.3 Community General Information**

Tupperng is a very long-established community. Many villagers migrated from Sukhothai Province and relocated permanently on the banks of the Yom River several centuries ago. Since then, they have been doing agricultural work for their main source of revenue and exploiting the Yom River for travel, communication, and consumption. Houses in Tupperng Community were usually constructed of a single story with a high basement. These houses were located close together, in no orderly fashion, in a row along the banks of the Yom River. No fences separated the houses, only trees, such as sapodilla plums, jackfruit trees, mangoes, and marian plums. There were also small roads along the western riverbank. The houses were located close to the eastern riverbank, where there was a road, 50 meters away from the riverbank. There was also a suspension bridge, which was called “Saring Bridge” by the villagers, connecting both riverbanks. Thus, the villagers could communicate with each another by foot, bicycles and motorcycles using this bridge. Tupperng Temple and Tupperng School were both located on the eastern riverbank, and were recognized as the center of Tupperng Community for the villagers on both sides of the river.

Further basic information describing not only the past but also the present condition of the community in terms of various aspects will be explained as basic data in considering the community’s lifestyle and waste management, as follows:

##### **4.3.1 Establishment of the Community**

A historical study of Tupperng Community found that the community had been established on the banks of the Yom River for a very long time. The legend of the community’s name says that merchants traveling by ships from the central region sold goods in Sawankalok. When they arrived at the Tupperng Community, they found many beehives on the trees. They stopped, set up a colony on the bank of the Yom



River, collected honey from the beehives, and sold it. When the merchants traveled to sell their goods, they stopped at Tupperng to collect honey for sale. This area has been called Tupperng Community ever since.

Considering the location and geography of present-day Tupperng Community, Tupperng Sub-district (Tambon Tupperng) is located between Sukhothai and Srisamrong District (Amphur Srisamrong), i.e., Sukhothai and Amphur Srisamrong are located on the same river, the Yom River. Tupperng Community itself is located on the river basin. The banks of the river were very suitable for cultivation and establishing the community. According to the evidence, it is assumed that Tupperng Community is one of the oldest communities and might be as old as Amphur Srisamrong.

#### **4.3.2 Community Size and Location**

Tupperng Community is an 18-square-kilometer community located in Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai). It is 10 kilometers from the provincial hall and 8 kilometers from the district office of Srisamrong. In the north it is closest to Wangyai Sub-district (Tambon Wangyai), in the south closest to Pakquae Sub-district (Tambon Pakquae), in the east close to Koetaliang Sub-district (Tambon Koetaliang), and in the west closest to Wangyai Sub-district (Tambon Wangyai). Tupperng Community is located at Villages 1 and 8 (Moo 1 and 8), Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai). The Yom River is the main river, which flows between, and divides Villages 1 and 8 (Moo 1 and 8), Tupperng Sub-district (Tambon Tupperng). The communities on both riverbanks were similar, and the villagers were relatives of each other. For instance, some families were located on the eastern riverbank, but the daughters married and relocated to the western riverbank. Some families were located on the western riverbank but their occupations were on the eastern riverbank. So, the river did not separate the lifestyles of the villagers on either side of the riverbank. Mutual ownership and consumption could be observed. In addition, 90% of the population was farmers, i.e., they managed tobacco plantations and farmland. The majority of the Tupperng Community area was situated on the Yom River basin, so the soil was abundant and suitable for cultivation.

### 4.3.3 Borders

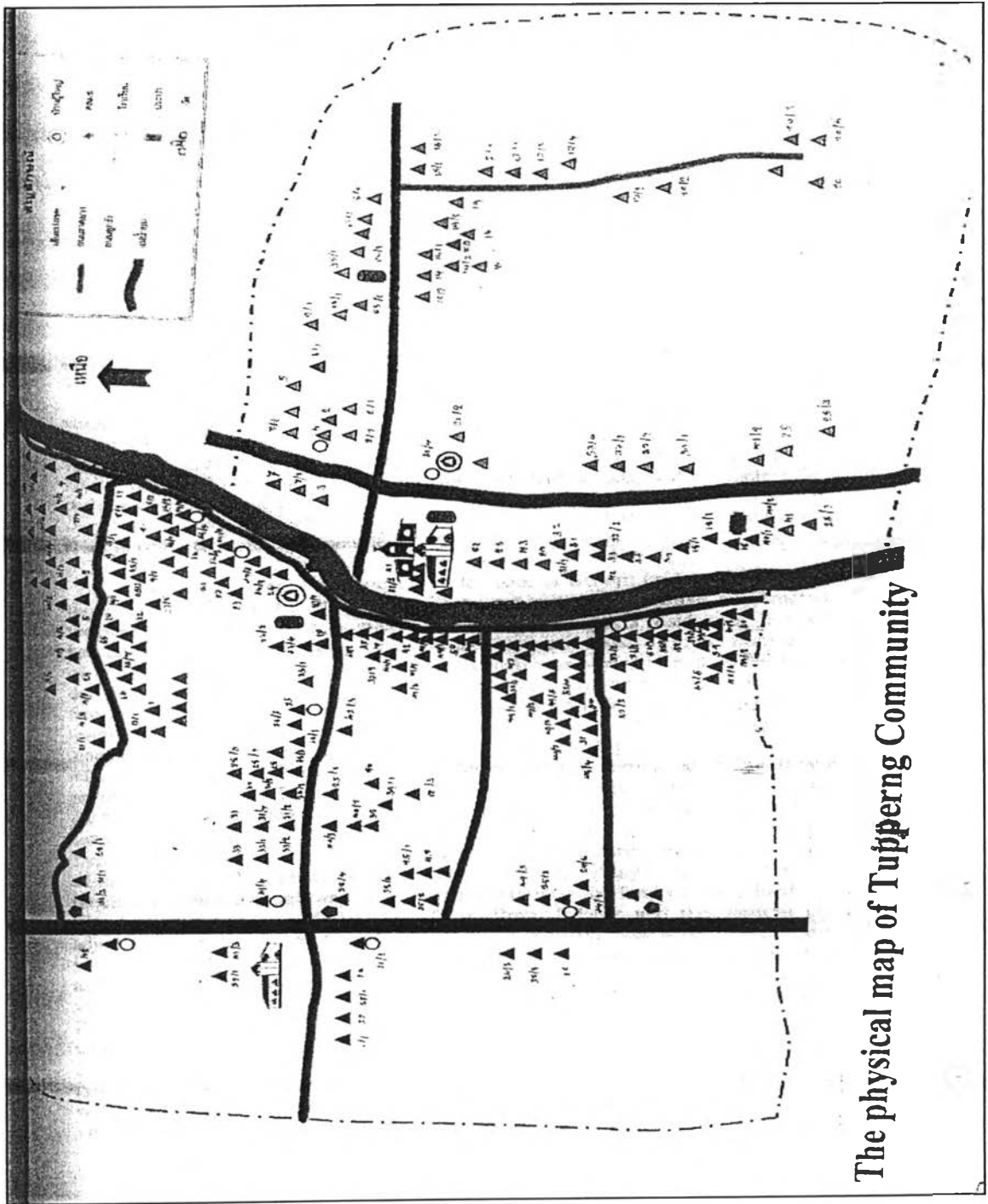
Tupperng Community, Village 1 (Moo 1), Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai) had the following borders:

- North: Village 3 (Moo 3), Wangyai Sub-district (Tambon Wangyai), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai).
- South: Village 3 (Moo 3), Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai).
- East: Yom River
- West: Village 3 and 4 (Moo 3 and 4), Wangyai Sub-district (Tambon Wangyai), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai).

Tupperng Community, Village 8 (Moo 8), Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai) had the following borders:

- North: Village 2 (Moo 2), Wangyai Sub-district (Tambon Wangyai), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai)
- South: Village 2 (Moo 2), Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai)
- East: Koetaliang Sub-district (Tambon Koetaliang), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai)
- West: Yom River

The map of Tupperng Community will be displayed below:



The physical map of Tupperng Community

Figure 4.1: The map of Tupperng Community will be displayed below

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#### 4.3.4 Community's Physical Environment

The Tupperng Riverbank Community consisted of two villages, that is, Villages 8 and 1 (Moo 8 and 1) separated by the Yom River. Thus, the villagers usually referred to it as Western Tupperng and Eastern Tupperng. The villagers could communicate with each another by traveling across the suspension bridge (called "Saring Bridge") because there were rectangular concrete posts situated on both sides of the riverbank, which were connected by big iron wires (called "Saring wires" by the villagers). The bridge floor was made of palm-sized wood plates, which were arranged extendedly. The bridge was 2 meters wide, so motorcycles could be ridden across. However, the villagers preferred to walk across the bridge. As the bridge was like a suspension bridge, it swung when the villagers walked or rode motorcycles across. Strangers who were not familiar with the bridge would face problem when they walked across, and some even felt dizzy. However, Tupperng villagers could walk adroitly across the bridge. Furthermore, the bridge was regarded as the symbol of the Yom River because there were similar bridges in all of the sub-districts that the Yom River runs through. Tupperng Bridge was built in 1967. A large concrete bridge, built in 1989, is located 2 kilometers away from the community, enabling villagers to drive cars across. So, if Tupperng villagers wanted to go across to the other side by car, they had to drive around for 2 kilometers, and then drive back along the to meet other people.

Tupperng Temple is located at the eastern foot of the bridge. This temple was recognized as the community's center because it was constructed simultaneously with the villagers' houses. The temple consisted of five monks' residences. The sermon hall had a high basement, the wall was made of iron and looked airy, and the floor was made of wood. It was obvious that the hall was very old and some parts had deteriorated, especially the toilets and staircase rails. The sermon hall's post was made from a big teak log. There were platform seats for the monks facing south and the temple's front door was on the eastern side of the building. The church was located on the northern side of the hall and the temple grounds were half a football-field in width. When the villagers walked across the bridge, they could enter to the temple's precincts promptly. According to the beliefs of Sukhothai people, the temple should face east, especially the entrance door. Tupperng Temple was constructed in 1887 on

approximately 6 Rais, 3 Ngans, and 25 square wahs of land. Tupperng Temple was granted consecrated boundaries on 5 March 1892. In addition, faithful villagers donated the temple precincts, in 1887. The northern precinct reached the pathway, the southern adjoined the land of Mr. Muan and Mr. Tian, the eastern reached the site of Mr. Prom Paksin, and the western precinct adjoined the Yom River. At present, Mr. Chung Yooyen is acting as the temple's manager. Monk Direk, the abbot of Tupperng Temple, described the temple's history, as follows: In 1914, Somdech Phramahadamanachao Kromphrayawachirayanwaroros visited the monks in the northern Monastic Order along the Yom riverbank in Sukhothai Province (Changwat Sukhothai). He also visited and had a forenoon meal at Pumra temple (now Tupperng Temple), where the villagers built a shed for him, at 11.00 a.m. on 6<sup>th</sup> December, 1914. Phrayaratchapakdee, the governor, all ranks of government officials and monks had the forenoon meal together at Pumra Temple, as well. Monk Kham, Mr. Chin Amdaengtun, and the villagers, welcomed these guests. Mr. Chin Amdaengtun, who built the church, asked for the consecrated boundaries, so Somdech Wachirayanwaroros told Phrathammarajarn to investigate other temples that had already received consecrated boundaries. He gave a sermon to the villagers on the ground because there were insufficient seats for the villagers in the hall. After the sermon, he told Phrathammarajarn to change the name of "Pumra Temple" to the same name as the village, that is, "Tupperng Temple." Then, he got on the boat and traveled to Sukhothai at 1.35 p.m." (Monk Direk – Group discussion, 2004).

A road to the east of the temple spanned Village 1 (Moo 1) to Wangyai Sub-district (Tambon Wangyai). The grocery, owned by Mr. Srisamut, the village headman, was opposite the temple. Mr. Srisamut was the community's leader, and was widely respected by the villagers. His wife was a teacher at Tupperng School, which was located close to Tupperng Temple. It was a medium-sized primary-level school, with 95 students from kindergarten to primary levels (grade 6). The school consisted of two ancient, low, wooden buildings and two very-old teachers' residences, which were located close to the Yom River. Most teachers were from other locations, except the wife of the village headman, who was a local. The front of the school was close to the community's main road and the rear was close to the Yom River. A 170-centimeter-

concrete fence encircled the school. A tobacco house, which belonged to one of the community's rich people, was located some distance across from the front of school.

Village 1 (Moo 1) of Tupperng Community was located on the western bank of the Yom River. Across the suspension bridge on the western bank, stood the community's elementary public health center, which was a low-shaped building, located close to the Yom riverbank. The community hall, information center, medical fund (original), agricultural center and housewives' center were located in the same area as the public health center. The house of Mr. Somnuek, the Village headman, was situated opposite the public health center. He donated the land and initiated the construction of this multipurpose building. There was a concrete road on the western riverbank passing through the community and connecting to the Sukhothai-Srisamrong main road to the west of the village.

The social map of Tupperng Community could be displayed as below:

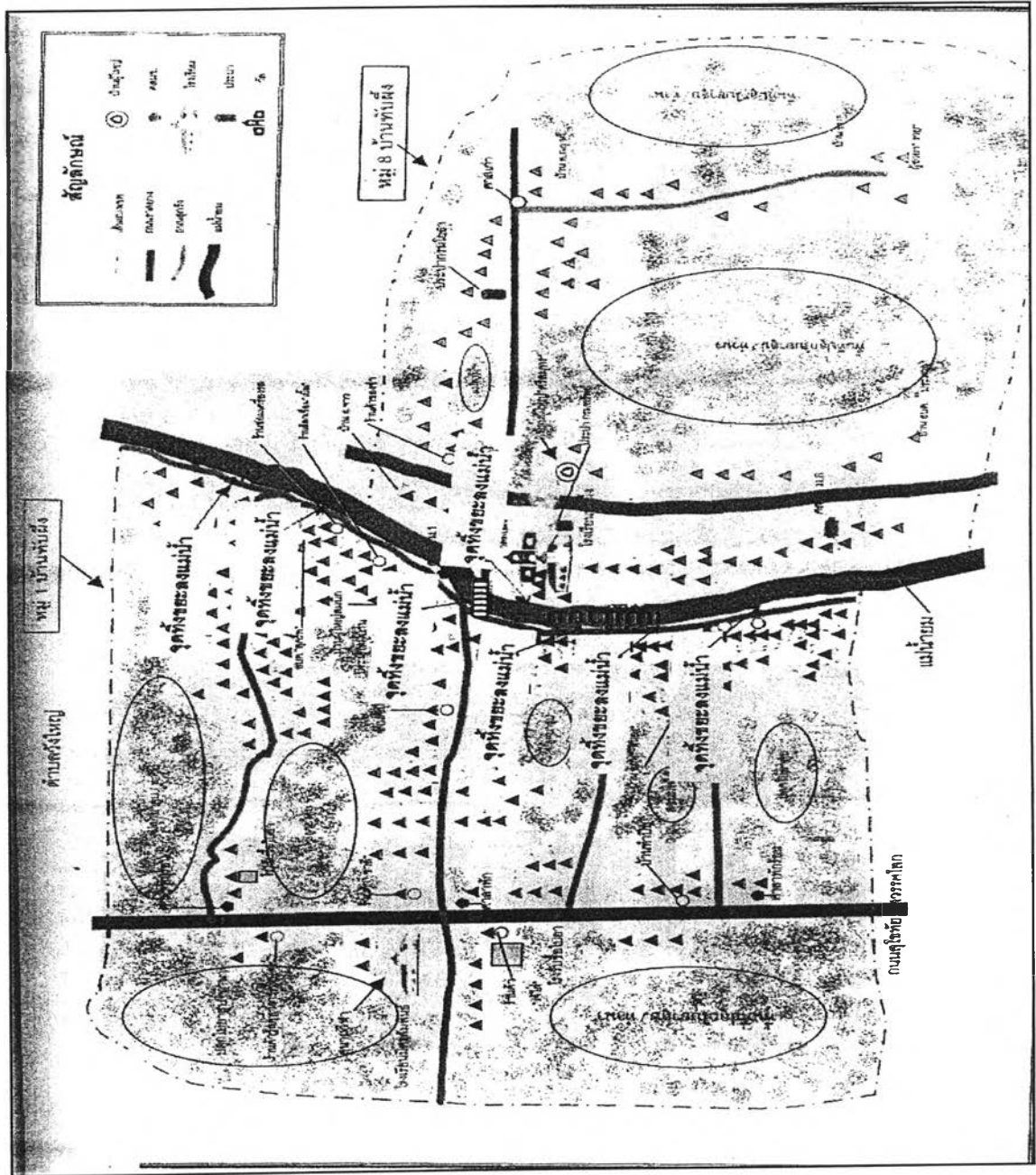


Figure 4.2: The social map of Tupperng Community could be displayed as below

#### 4.3.5 Communications

Traveling to Tupperng Community from Sukhothai Province (Changwat Sukhothai) by car was very convenient, having two routes. One route was to travel along highway number 101, that is, Jarodvitheethong Road on the Sukhothai-Srisamrong route, which was to the east of the Yom River. Upon arriving at Kilometer 9, a turn at Tupperng junction goes to the eastern community. The other route was to travel along highway number 1105, that is, the Sukhothai-Srisamrong back route, which was in the west of the Yom River, then a turn in front of Mitsampan School went to the western community. For communication between the sub-district and the district or the sub-district and the province, buses ran from Srisamrong-Sukhothai all day. There were asphalt roads within the community and a concrete one that ran across both communities. Apart from this, the suspension bridge between Villages 1 and Village 8 aided communication between the two villages. As communication from the city to the community became more convenient, there were more opportunities for the villagers to bring goods to the community. As a result, there was a lot of waste and various kinds of garbage in the community.

#### 4.3.6 Climate

The weather in Tupperng sub-district is usually hot for most of the year. Summer begins around March to mid-May. Such hot weather helped the waste, polluted water and garbage to rot more rapidly. In April, when the highest temperature for the community was 40°C, there was only a little water left in the Yom River, with no flow. As a result, the amount of oxygen in the water decreased and the water became greenish and foul-smelling. With the larger amount of waste being thrown into the river, the water diminished more rapidly because of the hot weather. Moreover, sunlight and high pollution levels accelerated the water's condition and encouraged some toxins in the water to become more poisonous. The rainy season began around May and ended in October. The total annual rainfall was 1,732.2 mm, and the rain fell most heavily in September. Consequently, there was too much water in the Yom River and it flooded the households. In addition, the flood brought refuse, waste, and garbage, which became stuck at the bridge and around the households. When there was flooding, the villagers usually excreted and threw the garbage into the river. Winter lasted from the



beginning of November to February. The lowest temperature was 14.3°C. In January, during the winter season, the villagers usually grew vegetables on the banks of the river because they grew well. In addition, the villagers dammed up water in the Yom River by using sandbags to prevent water from flowing away. The overuse of toxic chemicals to eliminate insects and weeds contaminated the Yom River even more.

#### 4.3.7 Population

Tupperng Community, Tupperng Sub-district (Tambon Tupperng), Srisamrong District (Amphur Srisamrong), Sukhothai Province (Changwat Sukhothai) consisted of two villages with a total of 272 households, i.e., 361 families with 1,083 villagers, as displayed in the table below.

**Table 4.3 :** Population in Tupperng sub-district education zone

Village (Moo)	Number of Households	Number of Families	Male	Female	Total Population
Moo 1, Tupperng Village	195	255	347	379	726
Moo 8, Tupperng Village	77	106	160	197	357
Total	272	361	507	576	1,083

Source: Tupperng Sub-district Administrative Organization, as at 28 December 2003

In terms of village level governmental administration for Village 1 (Moo 1), Mr. Somnuek Yimpin was the village headman, and Mr. Chom Yimpin and Mr. Somchai Yimpin were his assistants.

In Village 8 (Moo 8), Mr. Srisamut Suaklin was the village headman, and Mr. Somchit Saengsri and Mr. Ruay Khoboon were his assistants.

#### **4.3.8 Education**

Most villagers in the community had graduated at primary and secondary levels (Grades 4, 6, 7 and 9). Tupperng villagers were very interested in education, which was evidenced by their supporting their children to study at school. Thus, the current youths were studying to not less than high school level, i.e., more villagers had graduated with a bachelor or master degree. However, looking back ten years, only a few villagers had graduated with a bachelor degree. At present, there are also external classes on Saturday and Sunday, from primary to high-school levels at Tupperng School, teaching the villagers who had had no opportunity to study in normal systematic classes. Many community leaders were attending this educational system to raise their academic status. Apart from scholastic education in school, there were other special courses for villagers in the community; for instance, there were Dharma classes in the temple for students, youths and villagers. There was also education in health, occupation/career, agriculture, general news, etc. from the news distribution tower. The villagers shared knowledge among themselves, such as among the community leaders, the committee of the Sub-district Administrative Organization, the Public Health Volunteers, etc. Multilateral representatives participating in the research consisted of one master degree holder, four bachelor graduates, five high-school students and some primary school students. Tupperng Community had two schools--Mitsampan School, in Village 1 (Moo 1) of Tupperng Sub-district (Tambon Tupperng), where there were 135 students and 8 teachers teaching grades 1-6; and Tupperng School, in Village 8 (Moo 8) of Tupperng Sub-district (Tambon Tupperng), where there were 95 students and 8 teachers teaching grades 1-6. Both primary schools were under the Office of the National Primary Education Commission. Most students were local and some were from the neighboring villages.

#### **4.3.9 Religion**

Most Tupperng villagers believed in Buddhism (Hinayana Sect) and also drew on Buddhism to nurture the spirit and implant morality. The temple and monks were important in the function of gathering and encouraging community members to be good citizens. In addition, the villagers used Dharma and philosophy in their lives to solve problems and obstacles in families. As a result, religion created harmony and stability in the community.

Therefore, the temple and the community were inseparable from each other. Tupperng villagers supported Tupperng Temple, in Village 8 (Moo 8), for several generations because they had faith in Buddhism and the Buddha's Dharma. The temple provided moral teachings and was where the villagers performed religious ceremonies. Apart from this, the temple was the place for villagers from both riverbanks to perform social activities together. At present, Monk Direk Tiraseero is the abbot of Tupperng Temple. Tupperng Temple was regarded as the most appropriate place to perform village activities because it was spacious, secure, peaceful, and convenient for communication. Moreover, there were facilities for meetings, such as long-shaped tables, chairs, fans, coolers, glasses, big mats, dishes, and plates. The villagers donated these facilities, and the names of the donors were written on the equipment. The temple was the place for meeting, parties, training, seminars, etc., because it was convenient for all public and private sector organizations. In addition, the abbot played a great role as a lecturer, advising the community's meetings and activities.

The temple was the place to publicize the Buddhist solution or the Four Sublime Truths used in the villagers' daily routines. The role of the monks was to pay homage to human development and behavior in terms of physical, verbal, mental and intellectual aspects, by using the three-study system to encourage the villagers to understand the truth of life, so that they could live in harmony with their neighbors and all animals happily and appropriately. Buddhism always emphasized promotion of Dharma Scriptures and Practice among the Tupperng villagers. It was observed that Tupperng Temple was the place where villagers were taught about religious concepts, to solve problems with the principles of the Four Sublime Truths. From the abbot's sermons on various occasions about the Four Sublime Truths, it could be concluded that the sublime truth discovered by the Buddha was general and everyone could discover it by analysis, as well. The truth was that anything could become a problem, so we had to know the cause of such problems. After knowing the cause of the problem, we could find a solution. This was the universal analytic principle to solve all problems. However, the Buddha reached the next step, perceiving that humans caused physical and mental suffering. Meditation was the way to eliminate this suffering. Ordinary persons, who were still greedy, angry and passionate, could utilize the principles of the

Four Sublime Truths to analyze both their own and society's problems. They would realize what the real problem was, what the cause of the problem was, what the solution to the problem was, and how to make decisions.

In reality, all Buddhists in Tupperng Community were instilled with the principles of the Four Sublime Truths from studying moral subjects in primary school, and from attending sermons on religious days. As a result, the villagers tried to solve problems and adjust themselves by using the principles of the Four Sublime Truths so that they could survive in society. Finally, they learned and understood everything clearly.

#### **4.3.10 Public Health**

There were two Community Elementary Health Centers (CEHC) in Tupperng Community. Moreover, Village Public Health Volunteers (PHV) took care of the villagers primarily. At present, there are 28 public health volunteers and Mr. Somchai Yimpin is the group chairman. The public health volunteers used the Community Elementary Health Center as the nursing office. However, when the number of sick people was beyond the capacity of the Community Elementary Health Center, the villagers would be treated at Tupperng Public Health Center. There were two Public Health Centers in Tupperng Sub-district--Tupperng Public Health Center and Tawejnok Public Health Center. Tupperng Public Health Center is also the location for the Community Health Service Center of Srisangwormsukhothai Hospital, which was the general hospital of Sukhothai Province (Changwat Sukhothai). When Tupperng villagers were sick, most of them usually went to the public health center. Apart from the good service, Tupperng villagers were intimately acquainted with the public health authorities working at Tupperng Public Health Center because these authorities were friendly and visited the village often. Moreover, the villagers admired several projects conducted by the Public Health Center, for instance, the 30 Baht Cure All Sicknesses project, the Aged project, the Exercise project and the Drug Treatment project. If the patients' health status became more serious, the public health center would chauffeur them to Srisangwormsukhothai Hospital, a public hospital located 9 kilometers from the community. On the other hand, several wealthy families preferred treatment from a

clinic located in the Sukhothai local government area, because it was very convenient for travel, especially for western Tupperng villagers. Moreover, Tupperng villagers did not like to buy medicines themselves because there was no drugstore in the community; the grocery sold only ointments and inhalants.

#### **4.3.11 Community Language**

All Tupperng villagers spoke the local Sukhothai dialect. This language was similarly spoken in all districts of Sukhothai Province (Changwat Sukhothai) and in some parts of neighboring provinces, such as Uttaradit, Phitsanulok and Kamphaengphet. The accent was quite different from that of the central Thai language. The villagers called the central Thai dialect “Phudkai”, and the local Sukhothai language “Phudkheun”. Speaking the same language showed the community’s harmony and intimacy. Tupperng villagers who went to study or work in Bangkok or other cities usually greeted each other in Phudkheun when they met. When these villagers returned to their community, they also spoke the local language; no villager preferred to speak the central dialect in the community, except for speaking with the teachers at school. Anyone who did not speak the local dialect might be reprimanded that they had forgotten their origins. The local dialect used by Tupperng villagers had a different accent, and many words also deviated from the central language. Speaking the same dialect played a significant role in community participation. Speaking the same local dialect showed harmony, intimacy and trust. Thus, the villagers dared to reveal their problems and express their opinions to a group. Moreover, the consciousness of loving their birthplace further encouraged the villagers to join the group.

#### **4.3.12 Local Organizations: Management Experience and Community Solutions**

Villager unity: on both riverbanks of the community, villager groups and organizations performed public activities. Each group and organization shared the same purpose, to develop and to solve village and community problems. There had to be mutual goals, objectives, satisfaction, demands and meetings to unify the villagers to perform activities together. Thus, the villager groups and organizations in the Tupperng Community consisted of formal groups and organizations, i.e., government

organizations established for political, administrative and community-development purposes. There were also informal organizations established by the villagers because of their interests, providing solutions to needs, or community development. According to a community study, the villagers groups and organizations may be categorized as follows:

#### **4.3.12.1 Formal Organizations:**

- A. Village Committee: Established by the government according to the administrative order of the Local Development Plan, Local Service Office, Department of Local Administration, Ministry of the Interior. The present community committee of two villages originated in 1992 from a formal agreement and consists of 10 persons; Village 8 (Moo 8) had an equal number of committee members, namely the community's chairman, the community's deputy chairman and eight community committeemen. The committee's main duty was to manage the village and divide the responsibility into 8 sections--administration, public health, finance, public relations, defense, education, development and consultancy.

The uniting of the community leaders was formal. It was presented in the form of a meeting of the Village Committee. When the community got news and information from the district, there would be a meeting to plan the village development and operations budget. Moreover, there would be a meeting to provide planned solutions for various potential problems in the community, such as disasters from high winds or storms destroying households, fruit and vegetables, floods damaging roads and plantations, which led to a lack of water. There was also funding for the village's occupational development. The leaders would consult and share their opinions among themselves in order to find a solution, divide the responsibilities, manage local resources and summarize performance. Observation by the researcher working with the community indicated that, although the Village Committee was derived from establishment by the government, selection of the members was performed and decided upon by the villagers. Therefore, the villagers trusted and respected the one who chosen to be a Village Committee member, because he/she devoted himself/herself to

developing the village. The villagers were either related to, or were familiar with, the Village Committee. When a problem arose in the community, these persons worked together and cooperated to solve it. So, this group played a role in guiding ways to solve the community's problems.

- B. The Aged Group: This group consisted of the leader and 30 aged members. Activities were held in the community (at Tupperng Public Health Center) once a month, to promote aged persons' health. The activities consisted of general health check-ups, weighing, blood-pressure measurement, etc. When someone needed to see the doctor because of a serious illness, the villager would be sent to the hospital for medical care. The welfare activity dealt with giving advice on fringe benefits, such as issuing aged cards or coordinating with provincial public welfare to help the aged who had no healthcare benefits. The aged villagers were willing to join all recreational activities held by Sukhothai Province (Changwat Sukhothai). Both villages established the aged group by themselves in accord with the operations of public health volunteers and community leaders. The aged group was advised by public health authorities aiming to take care of their health. Thus, both aged male and female villagers over 60 years old were performing the activities together. Moreover, these aged villagers in Tupperng Community were also members of The Aged Association of Thailand.

Apart from combining to take care of health, the aged group also performed activities together on various occasions in the community, such as funerals and other rituals. There were no rules for the incorporation of the aged group. All aged persons in the village were important to the community's members because they were leaders in terms of thought, knowledge, and local intellect. Moreover, they also gave advice on work and work habits, and encouraged and assisted the villagers in terms of ideas and funds, to solve different problems in the community. The roles of the aged in the community were to teach their children to be good citizens and to encourage their children to live happily.

- C. Village Public Health Volunteers (PHV): established by Tupperng Public Health Center; the committee of Village Public Health Volunteers consisted of the chairmen from each village, i.e., Mr. Somchai Yimpin from Village 1 (Moo 1) and Mr. Saengthongkham Biatub from Village 8 (Moo 8).

The Village Public Health Volunteers were villagers who voluntarily and willingly devoted themselves to work for the health of the community. These volunteers had been periodically trained about health by Srisamrong Health Office. Moreover, there was a monthly meeting among the Village Public Health Volunteers. All Village Public Health Volunteers were responsible for the elementary health of the community, and their personal care and public health. Their roles in the community were as follows:

- 1) Assisting with elementary health services and giving advice to the villagers as best they could.
  - 2) Providing health care knowledge from their experiences to family members and to villagers in the community.
  - 3) Following up and closely watching villagers' health in case a villager with some sickness had to be cared for.
  - 4) Developing the village by associating with the villagers' health, such as surveying village information, campaigning to prevent and solve health problems, and providing health products. The performance of Village Public Health Volunteers in the community could suitably be linked to activities and projects dealing with health.
- D. Housewife Group or Female Group of Tupperng Sub-district (Tambon Tupperng): established by a public-sector organization, the Sub-district Development Organization. The group leader was Ms. Pratoom Inkong and there were 40 members. Specific activities were clearly advised by the sub-district. Moreover, the sub-district supported the Tupperng Housewife Group and gave the opportunity to the group to join academic and occupational training held periodically by the Sub-district Administrative Organization. For instance, the community's female leaders participated in



a project to produce wine from galingale or sour pork and shredded-salted pork, to comply with the project “One Tambon, One Product.” These housewives participated only when they had time. When requested to join the activities of the Sub-district Administrative Organization, the housewives participated willingly.

The Housewife Group, which stood for the community, was a natural gathering of women in the village. These housewives gathered together periodically, particularly aiming to help with community activities, such as merit ceremonies, funerals, or other rituals in the village. At the beginning, the women performing the activities together were all married, so it was called the “Housewife Group”, but later some unmarried women, who were interested in the activities, began joining the group. Moreover, the Community Development Section established the female group under the name “Female Community Development Group.” As there was occupational support and promotion of community products, other departments increasingly supported the female group, such as the Department of Local Administration and Sub-district Agricultural Section. However, there were many conditions for occupational support, such as budget and marketing. Moreover, the sub-district’s public health office sent the community’s female leaders to join various health projects.

When the housewives gathered together periodically, they performed various activities, such as merit ceremonies, funerals or other rituals. As they provided food for the guests, there was an expert female chef in the village, who could manage it, estimate the amount of food needed for the guests, and who had delicious recipes. Additionally, the housewives took care of their family in all respects, including development and problem solution. The operation of the housewife group emphasized coordination with the community leader and local public- or private-sector organizations. The housewife group also paid attention to their family’s, and the community’s, economy. The group was the core section establishing the Saving Group for team production. According to a meeting, it was suggested to consolidate the village funds and the village saving group, to enhance the stability of the village’s savings funds.

- E. Saving Group of Tupperng: the group consisted of 83 members aiming to raise funds from the villagers for low-interest loans. All members had to buy at least two shares at the price of 10 Baht per share. Then, the members had to deposit money every month; the total revolving fund was 65,000 Baht.

Establishment of the Saving Group of Tupperng was conducted under the concept of encouraging “self-dependence” through the learning process, so the village organization would be stronger. The administrative committee had an opportunity to learn fully under the group working process, in terms of discussion for adjusting work methods to be consistent with the community’s context and external influences. The members could manage the job without obstacles. Solving problems that occurred during activities together and meeting with many external people at various ranks could encourage the young committee to be more confident and dare to express their opinions.

The Saving Group of Tupperng aimed not only at helping with funds, but it was also involved with helping intellectual and other resources, because at the end of each month, there would be a meeting of the committee to discuss previous performance and plan future operations, related projects or activities, including the community movement. Moreover, it was found that the Saving Group of Tupperng could help solve problems by analysis and brainstorming. After that, on the 3<sup>rd</sup> day of each month, the members would deposit the money; therefore, they had an opportunity to meet and discuss further details.

#### **4.3.12.2 Informal Organizations**

The Youth Group or The Juveniles Group gathered naturally, so the number of members was not constant. The members consisted of pupils, students and non-students. The group chairman was Mr. Nopparat Rattanayam. This youth group was established to help with community activities on different occasions. The village headman supported the group and the village committee because everyone thought that if the adults gave care, helped and understood the youth, they would become closer and

perform activities together with the adults. Moreover, the young people would not be involved with drugs. Similarly, Tupperng Sub-district Administrative Organization always paid attention and supported youth activities because it was believed that if the youth were supported and cared for, they would have no problems and would not become involved with drugs. The village supports for youth were various; for instance, in the case of a sporting event, the youths would be encouraged to compete in the sub-district and district levels, and the community leaders and parents would provide clothes and cheer for them during the competition. Having the adults and youth performing activities together was beneficial to the development of the village and the environment. Moreover, training was provided for the youth in AIDS and drug prevention, development of morals, and performing traditional activities together.

When considering the cooperation of the community's organizations, discussion usually centered on cooperation, and beneficial activities often derived from discussion. It would be more informative especially when teachers, public health doctors and the deputy chief of the Sub-district Administrative Organization, who had knowledge and modern opinions, joined the discussions, because broader concepts would be available. As a result, there would be more creative activities in the community. The villagers' gatherings developed cooperative power, helping the community advance quickly. At the same time, knowledge, systematic thoughts, and the experience of the community leaders were also powerful, encouraging the villagers' learning and enhancing the stability of the community.

#### 4.3.12.3 Experience in Problem Management in the Community

Conflicts or problems in communities are normal and each community manages the problems differently, according to the problem's context. Group discussion with the villagers and the representatives of the selected organizations in this research showed that the community used to have problems and these problems were managed by investigating their causes and finding ways to solve the problem, in a manner that could relieve or eliminate the problem from the community. Previous problems in the community were as follows:

### 1) Environmental Problem

As the village was located close to both riverbanks, there was consequently a problem about throwing garbage into the river, especially animal remains. The headman of Village 8 (Moo 8) talked about the problem of throwing animal remains into the river via the news-distribution tower. He said that all villagers normally thought the river was a place to throw all garbage. This conduct caused problems for everyone who used water from the river. Therefore, everyone had to be involved in the community's waste management solution and participate in solving environmental problems. The community held a campaign for environmental development, emphasizing litter and garbage removal, and picking important days, such as the 5<sup>th</sup> of December or the 12<sup>th</sup> of August. Moreover, the villagers living near the riverbanks should take care of the river and mow the grass to maintain a better landscape.

Therefore, solving the garbage problem was based on participation and conscious ownership by the community. Understanding the community's problems was the beginning of solving them. In addition, the community exploited the existing power and learned from their mistakes to solve the community's garbage problem. All villagers participated and shared their opinions, both agreements and disagreements, so this was the beginning of solving the community waste problem.

### 2) Drug Problem

The drug problem was solved by the community leaders, the Village Development Committee, and the group representatives/villagers' organizations. The village headman made an appointment with all parties to join a meeting at his house; teachers, police, the district deputy and public health doctors participated in this meeting, as well. The village headman started by informing them of the drug problem situation, including the cooperative activities of different groups/villagers' organizations and the community leaders. He also asked all persons to express and share their opinions for planning purposes, using the community participation technique, to include the operational plans used to solve the community's drug problem, such as providing knowledge about drugs in the community by the voice-through-line method; discussion with villagers on different occasions, such as at work

or at traditional ceremonies; participating and being the backbone in prevention and solving the drug problem by coordinating with other groups and community organizations; giving assistance to groups like the villagers' organizations to publicize knowledge about drugs and helping addicts; providing and coordinating to obtain a funding-support budget to prevent and solve the drug problem; encouraging, giving a chance and assistance to addicts; providing knowledge to the villagers in various forms, such as youth and parental training, leaflet distribution and using local culture to perform the activities; and participation in such activities as anti-drug sport competitions and life-skills camps.

### 3) Low Price of Tobacco Leaf

The main occupation of Tupperng villagers on both riverbanks was tobacco agriculture. Every year, there was a problem with the tobacco price, because the farmers could not set the price themselves. As the tobacco price dropped, the farmers experienced increasing debt. The villagers gathered together aiming to help each other negotiate the tobacco price with the factories, asking for price reductions on equipment, fertilizer, hormone, etc. Concurrently, they collected and sold their products without middlemen. This gathering of the villagers was called the "Tobacco Farmer Group," focusing on mutual assistance among its members.

Although there were many problems with agricultural produce, the villagers thought that marketing was the main problem for their occupation. They had to visualize and solve all of their problems together because all villagers were affected. The villagers believed that they should all participate in ascertaining and solving problems. They should also attend the villager gatherings to demonstrate their potential in solving community's problems.

### 4) Conflicts in the Village

The researcher had studied and observed problem solving by local researchers, and found that the community used to encounter work problems and conflicts, especially related to interest and paying the village fund loan, an amount of one million Baht. The conflicts originated from misunderstandings because of word-of-mouth

communication and the lack of clear communication between the villagers. Therefore, the village had to hold a meeting, and during the meeting, it was suggested that all problems should be solved by talk and discussion. Moreover, there was also the proposal of possibility. By questioning the causes of the problem, the villagers understood the origin of the problem together. The solution could be performed by broadcasting the news correctly to the village representatives, emphasizing participation, whereas the village headman would coordinate with the representatives to build a relationship and acceptance within the village.

The identified community studies were various and consisted of community organizations, communication networks, and mutual assistance. There were also mutual learning and decision-making, the awareness of problems, resource management, and the raising and proper use of social funds. These things clearly indicated that the community had potential and readiness in its ability to gather and group. The grouping points were interesting and the researcher believed that these points could be efficiently exploited in planning the prevention and solving the garbage problem, including the wasted water from the Yom River.

## **4.4 Occupational Lifestyle Associated with the Waste**

### **4.4.1 Occupational Lifestyle**

#### **Tobacco Plantation**

Most Tupperng villagers had earned a living for a long time from growing tobacco instead of rice. The villagers preferred to grow rice and tobacco in the rainy and dry seasons, respectively. Although the life cycle of tobacco was very short, approximately 120 days, it had to be watered frequently. Mr. Chom said “*After having grown tobacco intensively, water in the Yom River dries up in the dry season every year*” (Mr. Chom Yimpin, Group Discussion, 2004). The tobacco plantation areas in 3 districts of Sukhothai Province (Changwat Sukhothai)--Srisamrong District (Amphur Srisamrong), Muang District (Amphur Muang) and Kongkailat District (Amphur Kongkailat)--required water from the Yom River. The villagers benefited from the annual floods of the Yom River, and as the riverbanks gradually changed because of the

accumulated sediments, the tobacco plantations yielded a lot of product. The tobacco farmers could also sell the tobacco at a good price because the soil was fertile. Therefore, the most important factor for growing tobacco, in the tobacco farmers' opinion, was the floodwaters of the Yom River from August to September, because they could yield good products. Ms. Pratoom said "*If there was a flood in any year, the tobacco was productive that year; on the contrary, if there was no flood, the tobacco was not so good.*" Moreover, the tobacco factory reported that the Srisamrong area was the best place in Thailand, where the highest quality tobacco could be produced.

Growing tobacco required patience, diligence and frequent care. The villagers started plowing the fields from October to November. The male villagers plowed the fields for cultivation, while the female villagers prepared the tobacco sprouts and scattered the sprouts in the fields. The villagers usually chose sprout fields that were near water sources, such as canals, swamps, or ponds dug by the villagers for holding water. These sources were near and far from the cultivation fields depending on the field-ownership status of the tobacco farmer. Soil in the fields was usually prepared by "manpower request", that is, assembling the male farmers owning small 8-12 horsepower tractors to plow the fields. The reason for exploiting small tractors was to prepare the "dry tobacco" fields shortly after the flood, while the fields were still wet. Thus, as the small tractors were light, they could plow the very wet fields without getting stuck in the mud or bogged down. After plowing, the field was dried in the sun for 7 days, so that the soil was loose. After that, the field was then repeatedly plowed several more times. While drying the wet soil in the sun, the villagers would plow other fields every day. It was observed that the villagers helping plow the fields owned their own tobacco plantations, as well. On average, soil preparation required 5-7 villagers, because 5-7 small tractors were observed in the same field.

Cultivating Field Preparation: the fields were plowed 3-5 times. The first plowing was called "*right and left plowing alternated with harrowing.*" The first period of right and left plowing alternated with harrowing was 7 days apart from the second plowing, to let the soil loosen and be easily broken. The second to fifth plowings were called "converted plowing." When the plowing/harrowing was finished, the villagers

would prepare the cultivating fields by themselves, that is, to elevate a ditch 10-20 centimeters in height and 1 meter in width. The next period, requiring the manpower request, was the time to dig holes and grow tobacco. Since the first day after planting the sprouts in the fields, the villagers got up around 3.00-5.00 a.m. every day to water the tobacco, spray insecticide, refill the fertilizer, move the water in and out of the tobacco fields and tobacco holes by drawing water through the prepared tobacco irrigation ditches. These activities were performed until the tobacco plants were 1.00-1.20 meters high. After that, the small, top branches of the tobacco plant were plucked so that the tobacco would yield thick, heavy leaves. Moreover, 10-30 mature tobacco plants were left to yield flowers, from which the villagers kept the seeds to grow next season. The number of tobacco seeds that the villagers picked indicated how much tobacco they would grow next season.

The female villagers usually prepared the tobacco sprout fields and sprouts. Fields were prepared similarly to the cultivating fields. However, when cultivating or growing the sprouts, the farmers would firstly put the paddy husk, black chaff and some ashes on the cultivating fields. After scattering the tobacco seeds, the farmers had to water them every morning and evening until the sprouts were 5 centimeters high, or had 3 leaves. Then, the sprouts were removed and grown in 5-10 centimeter-diameter cups made from palm leaves, newspaper, or coconut leaves. The cups were filled with soil from the sprout fields and the farmers soaked them every morning and evening. When the sprouts were 15 centimeters high or had 4-6 leaves, they would be moved back to grow in the prepared fields.

Growing tobacco required a lot of frequent attention and care, as Ms. Chuen said "*Growing tobacco is not different from bringing up children, because both require a lot of care.*" Water in the ditches had to be "driven" 3 times before the farmers picked the low parts of the tobacco plants, called by the farmers "*Earthen Tobacco*", which were yellow in color. Then, the farmers waited until the rest of the plants turned yellow and picked the middle parts of the tobacco, which were called "*Middle Tobacco*", and the top parts of the tobacco, which were called "*Top Tobacco*", respectively. The farmers picked the fresh tobacco leaves between 5.30-7.30 a.m. because it was not very



hot. If there were dry tobacco leaves, they were not easily harmed because the hot weather made the leaves crisp and discolored. The farmers cured the tobacco leaves in the air, i.e., they picked the leaves carefully and laced these leaves onto 20-25 centimeter-long sticks with a 2-5 centimeter space between them. There were 10-15 tobacco leaves per stick; then the farmers used a rod (1-2 inch bamboo) to hang them in the tobacco house, which was built near the houses. This factory had a high galvanized-iron roof with no walls. If there were no tobacco house, the villagers used the high-ceilings of their large basements for storing the tobacco leaves instead (the tobacco farmers usually built big houses with high basements; there were also long rods on their houses and in the basements for curing tobacco leaves). Having a personal tobacco house indicated economic status. Each household had 5-30 Rais for growing tobacco. The cultivation area depended on various factors, which will be discussed further.

The tobacco stems dried the slowest; however, when all leaves had dried, the farmers would bundle them together, which was called "*Bundled Tobacco*"; they would draw a fistful of the leaves from the tobacco rods, bundle the dried tobacco leaves, pack them in containers and distribute the product to tobacco factories according to the quota system (contract obligation) as the tobacco factories made contracts with the farmers. The rest of the tobacco was sold to brokers of private companies, who were called "*Cowboys*." The highest to lowest quality tobacco leaves are from the top parts or "*Top Tobacco*", from the middle parts or "*Middle Tobacco*" and from the lower parts or "*Earthen Tobacco*", respectively. The tobacco quality and price varied accordingly; but the tobacco quality and the weight varied conversely.

During the school holidays, from March to May, students were the main labor in the community. This helped students gain job experience and money. Students over 15 years old gained equal wages to the adults, at 100-120 Baht per day. Small students, or students who were less than 15 years old, would stitch the tobacco leaves (Tobacco Stitchy). In the past, about 15-20 years ago, stitching 100 rods earned 2 Baht; however, the present wage is 100 rods for 12-15 Baht. Thus, children could gain wages from being employed and they learned to seek, save and spend money by themselves, i.e., they learned to use their skills and labor to earn money.

The tobacco farmers' children usually sawed off pieces of bamboo, which were the same size as a coin, and put their coins in the bamboo stem. Frequently, they secretly cut a hole and put the coins in the bamboo post at their tobacco house. They opened their saving bamboos when they were full of coins or on the Songkran Festival. With this method, they could save their parents' money. Anyone who could save a lot of money was regarded as having a great ability because all money derived from their tobacco-stitching skill. As they had to stitch the tobacco leaves quickly, sometimes they were injured by piercing their hands while working. They had to wait until their wound had healed, so they could not earn money at that time. Saving a lot of money made the children feel proud of themselves and indicated that they could save more money and be rich like a millionaire in the future.

The farmers understood the effects on their health of earning a living by growing tobacco. *"I knew that since I had been growing tobacco, my body was gradually deteriorated. But what should I do? My children were studying."* The tobacco farmers had little time to rest and had to work hard. Moreover, they used high-concentrated chemicals and sprayed them every week from growing until picking the tobacco leaves. In addition, the farmers had to use various chemicals from the tobacco factories and from the chemical shops according to their contracts. When using chemicals to eliminate weeds, Tupperng villagers did not protect themselves properly; they did not wear a mask when spraying the chemicals because they felt uncomfortable. Moreover, while spraying the insecticide, the farmers usually walked forward, so that they had a greater risk of touching the chemicals on the tobacco leaves, and their clothes became soaked with the chemicals. According to an investigation after the harvesting season conducted by Tupperng Public Health Center, there were high levels of residual chemicals in their blood. Some farmers were even seriously allergic to such chemicals, and some had to be treated in the hospital for several days. Consequently, chemical allergy was the main health problem of the villagers in Tupperng Sub-district (Tambon Tupperng).

### *Farming*

Farming was a minor occupation of most Tupperng villagers. The paddy field was in the basin behind the village. All households farmed in May, which could be damaged if the field was flooded for more than 7 days. Thus, farming was more affected by the flood than growing plants. Although all household fields had specific borders, the unusual floods affected the farming. As a result, farming was limited for consumption for the household and the rest of the product would be sold. Nowadays, farming in Tupperng is less popular because of the effects of flooding, whereas tobacco is still the main crop.

Farming that was dependant on rain was called “seasonal paddy field”, which the family members farmed only once a year. However, sometimes they would gather and be employed at harvest time planting rice seedlings, and harvesting. When the rain fell for the first time of the season in May, the sprouts were prepared for planting rice seedlings. The rain watered the sprouts and the farmers moved them to grow on in the fields, from July to August. Farming in Tupperng depended mainly on the Yom River, because farming in the basin was based on expectations of the annual flood.

The slope characteristics of the basin were different, which influenced drainage. The sloping field west of the Yom River in Village 1 (Moo 1) sloped more than the eastern field. In Village 8 (Moo 8) it risked flooding because of its pan-like basin. Knowledge of the characteristics of each basin slope was related to knowledge about different paddy species. Most paddy species chosen for growing in the field were big species. The distance between the sprouts was greater than the smaller paddy species, and they could be immersed in water for 5-7 days; species such as Jampathong, Khiewnokkraring, and Loy, which are floating rice species. Such species could extend their stems 20 centimeters per day in a flood; sometimes, they could send forth shoots from the stems over the earth and also yield the ear of the paddy above the water surface. Some paddy species can even be grown and yield their product although the flood depth is 4 meters.

### *Growing Vegetables*

Growing vegetables was another minor occupation of the Tupperng villagers, which was preferably done in east Tupperng. Growing chili was widely popular and pricey. The red chili species, which the villagers had grown for a long time, were called “*Sauce Chili*.” Mr. Srisamut, the village headman said “*Tupperng villagers called it Sauce Chili because the factory uses this chili to manufacture chili sauce.*” (Srisamutr Suaklin, Group Discussion, 2004). In addition, the factory buying the chili would bring the seeds and other production equipment, like the tobacco factory, and the factory would deduct the cost when the villagers sold their products. Moreover, the villagers also grew green chili, yard-long snake beans and cabbage, which were sold to middle-merchants in the village.

The economic system, in Tupperng was mixed between working as employees and household agriculture. However, at the same time, there was a variety of occupations such as working as employees, being an official, business and service, apart from growing tobacco, growing vegetables and farming. There were various occupations in Tupperng because the tobacco business was adjusted and modified for other occupations that were not involved with agriculture. There was an economic difference between two generations. The economics of the ancestors derived from parents’ growing tobacco, whereas the economics of the current generation were various. Income from selling tobacco leaves was used to support children’s studies financially, and performing other non-labor occupations, such as being an official, providing services and doing business.

The economics of both generations affected differently usage of the Yom River and the difference remains in the contemporary society. The role of the ancestors confirmed a tight relationship with the community’s river, since they used the Yom River for cultivation. However, the current generation had occupations less related to the community’s environment, and they were also not farmers, who used benefits directly from the river. So, these people reacted less to changes in the environment and they also lacked a relationship with the river, because they did not derive benefits directly from it.

#### 4.4.2 Origins of Waste from Occupations

Conducting their occupations for increasing their income and profits, especially when selling tobacco leaves for a good price, the villagers began to over-consume and over-exploit capacity. Moreover, there were more shops selling things to the tobacco farmers during the tobacco-selling period. As a result, goods became more various--daily foods such as fresh vegetables, pork, fish, chicken, beef, seafood etc.; ready-made foods, such as canned food, instant noodles, soft drink, boxed milk, snacks etc.; and everyday-use items such as shampoo, soap, toothpaste, powdered detergent, etc. The excessive consumption led to increased residual waste. The packaging for the goods was made from plastic, foam boxes and synthetic materials. Since this packaging was durable, attractive, easy to use and cheap, general manufacturers favored them, and, since the packaging was durable, it would remain in nature for a long time. The villagers usually got rid of their refuse by throwing it away near their houses or into the Yom River.

During the harvest period, a large amount of tobacco would be transported from the plantations to the community for stichy and drying. Concomitant with this stage came garbage from broken tobacco leaves, which the villagers threw on the banks of the river leading to bad smells and disagreeable riverbank views.

In light of the occupational development of Tupperng Community in previous times, the local society associated more with the wider society, because Tupperng Community was located near the city of Sukhothai and communication relied upon waterways and roads, respectively. As a result, Tupperng Community had increased opportunities for advancement and modernization. Thus, the community's development was always closely related to changes in the wider society and occupational development. The beginning of the plantation system, especially the community's tobacco agriculture, derived from modern technology--machines, weeding chemicals, chemical fertilizers and modern tobacco species--which were supported by public authorities to substitute for existing production factors. This modern equipment could increase product yield amazingly. The factors pressing the villagers to increase their products derived from expansion of the marketing system, convenient communication, and agricultural-technological advancement. As a result, the villagers tried harder to

make money to buy more agricultural equipment, to generate more produce. Conversely, the modern agricultural manufacturing system seriously affected the environment and water quality. In line with the concept of growing only one kind of plant with most products, the villagers needed to use agricultural chemicals such as weeding chemicals and chemical fertilizers, which caused wide contamination of water sources.

Nowadays, Tupperng villagers do not undertake agriculture for family consumption as in previous times, but sell their products for household income instead, which is why they have to find different ways to increase the quality of their products. Thus, the requirement for fertilizers, hormones and weeding chemicals played a great role in the farmers' economy. Insecticides were especially used to reduce losses from insects and weeds. Tupperng villagers' wide use of chemicals and carelessness led to contamination of the Yom River. The villagers usually threw their empty insecticide containers, such as tins, bottles, drums and plastic bags directly into the river. This kind of garbage was hazardous and contaminated the water sources. Moreover, the villagers washed their contaminated clothes, which were worn while spraying insecticide, in the Yom River. Some villagers even washed the insecticide spraying equipment in the Yom River, so that the river became even more contaminated by chemicals.

Exploiting modern technology in agriculture, such as tractors, rickshaws, tobacco leaf compressors, insecticide sprayers, water pumps, ground-water drawing machines, etc. led to more garbage and waste, which was difficult to eliminate. It was observed that the garbage consisted of empty lubricant drums, lubricant tins, old belts, etc. Moreover, there was also poisonous garbage from agricultural activities such as bulbs, batteries, brake oil, containers of cleaning solution, etc. The villagers did not sort out and eliminate these kinds of garbage properly.

All Tupperng farmers needed the above agricultural machinery, e.g., tractors, which were dirtied with mud and oil and were always washed on the riverbanks in the evening after plowing. Thus, the water, contaminated by mud and oil, poured directly in the Yom River. In addition, changing tractor lubricants, which was done by many

households, led to additional oil being washed by rain into the Yom River, causing further contamination of the water.

Agricultural wastewater came from the banks of the Yom River, where the villagers grew vegetables and cured tobacco. The water was contaminated by nutrients, such as nitrogen and phosphorus, which entered the Yom River when it rained or during washing. Concurrently, wastewater from agriculture was contaminated with other chemicals, such as, insecticides or weeding chemicals.

### 4.4.3 Calendar of Tupperng Lifestyle

**Table 4.4 :** Calendar of Tupperng Lifestyle Categorized by Thai Months

<b>Thai Months</b>	<b>Universal Months</b>	<b>Occupations and Environments</b>	<b>Entertainments, Traditions and Rituals</b>
12	November	Water on the banks of Yom River was subsiding; the beginning of winter; doing tobacco plantation and growing riverbank plants	- Loy Kratong Festival - Tupperng Robe Presentation Ceremony
Ai (First month)	December		
Yi (Second Month)	January	Picking tobacco leaves	- Mid-House Merit Ceremony
3	February	Stitching and drying the tobacco leaves	- Third Month Full moon Ceremony
4	March	Selling tobacco leaves to the factories	- Baked Rice Bamboo Drawing Lots
5	April		- Songkran Festival and Aged Persons Bathing
6	May		- United Ordainment Ceremony - The Buddhist Lent
7	June		
8	July	Rainy season – farming; doing vegetable and fruit plantations	- Thai Autumn Festival
9	August		- End of the Buddhist Lent
10			
11		Flood Period – Fishing Cultivating tobacco seeds	- Tupperng Kathin Ceremony and Lord Buddha Sermon; Temple Festival; Sports; Boat Racing in Yom River



#### 4.4.4 Calendar of Community Activities and Seasonal Waste

In previous years, Tupperng villagers mainly performed agriculture, especially cultivation, which was regarded as the main income for living. Activities held in different seasons and the waste produced are as follows:

Winter (October-February): this season was for cultivating tobacco, which was the main economical plant of the community. In addition, the villagers concurrently grew winter vegetables such as chili, eggplant, bitter cucumber, and cabbage. The time for cultivating vegetables was shorter than that for tobacco. The cultivation areas could be the villagers' own lands or rented land, because each household grew approximately 10 Rais of tobacco. The wastes from this season were rotten vegetables and broken tobacco leaves, which were thrown and piled up in various places. These wastes decomposed and were malodorous. Apart from these, empty fertilizer bags and insecticide tins could readily be found.

Summer (March-May): this period was for growing vegetables, especially chili, as the minor occupation in some families, which were prepared in terms of land and water in the Yom River. As there were many merit activities in the community during this season, the wastes were from various kinds of hard-decomposed garbage, such as plastic bags, foam food boxes, paper, and vegetable refuse (e.g., corn husks, dry leaves) and rotten food leftovers.

Rainy Season (June-September): this season was for farming, which was regarded as another minor occupation. Many households in Tupperng farmed during this period, using some of their flooded lands after growing tobacco. Tupperng villagers used water from the Yom River for the irrigation system of the Royal Irrigation Department, and water pumps. The wastes found in this season were rotten fruits, because there was a lot of fruit in the market during the rainy season; the kinds of garbage were durian peel, mango seeds and peel, lychee, jackfruit, rambutan peel, custard apple, etc. Furthermore, there were also wastes from tractor oil and dangerous garbage, such as insecticide tins, old batteries, empty fertilizer bags and refreshing-beverage bottles, which were abundant.

#### 4.4.5 Cultural-Social Calendar and Waste

The First Month (or Ai month; between the end of December to the beginning of January): there were celebrations for the end of the year and for the New Year according to western tradition. During the first month, there was the Mid-House Merit Ceremony, when the villagers made merit and gave a midday meal to the monks, to discard bad things from their lives. The villagers also built rafts called “Songkraban” to float bad things in the Yom River. Thus, the wastes found this time were food leftovers, vegetables and fruits, banana leaves, foam, and papers from the Mid-House Merit Ceremony and the New Year Festival celebration.

The Second Month (or Yi month; January): there was a merit activity for Bamboo Baked Rice Drawing Lots. The villagers burnt baked rice in bamboo and offered it to the monks. Moreover, the monks in neighboring temples were invited to join the midday meal. Thus, there was a lot of waste, which consisted mostly of wet garbage from the merit activities at Tupperng Temple.

The Fourth Month (March): the Buddhist All Saints’ Day was on the full-moon day of the third lunar month, when the villagers offered food to the monks at Tupperng Temple. Thus, there were a lot of food leftovers from the merit activity.

The Fifth Month (April): this was the time of Songkran Festival or the Old Thai New Year, when there was bathing of monks, aged persons and adults held at Tupperng Temple. In this festival, the villagers built sand stupas on 12 April, which was called “Carrying Sand to the Temple”; on 13 April, there was a merit activity to celebrate these sand stupas. On this occasion, there was bathing on the roads; some young people went to bathe the elderly at their houses and some bathed the Buddha images at Tupperng Temple or at their houses. Most waste was created this month because a lot of people came home and there were many activities. As a result, a large amount of water was wasted, from throwing water, bathing the elderly, the Buddha images, dishwashing etc., which was eliminated into the Yom River. All kinds of garbage were found in this season, both wet and dry.

The Sixth Month (June): in this period the community's ordainment was held after finishing the principal occupation. The ordainment was held at home and at the temple. The wastes were mainly leftover food from the ordainment, plus papers, banana husks, banana leaves and coconut leaves from decorations in the ordainment.

The Eighth Month (July): this was the time of Buddhist Lent on the full-moon day of the eighth lunar month, and the wastes were food leftovers from the merit activity.

The Ninth Month (beginning of October): this was the time of the Thai Autumn Festival on the full-moon day of the tenth lunar month. The villagers made merit and offered Kayasatra, which was a stirred dessert, to the monks. Most wastes found were plastic bags, bean peels and banana leaves.

The Eleventh Month (end of October): At the end of the Buddhist Lent on the full-moon day of the eleventh lunar month, the villagers made merit, like other villages. During this period, the ceremony of rice consoling and the Annual Tupperng Temple Kathin Ceremony were also held. Besides general garbage, there were also scraps of flowers, especially marigolds, leaves, and steamed banana leaves.

The Twelfth Month (November): on the full moon of the twelfth lunar month, Tupperng villagers joined for Loy Kratong Festival in various places. The most garbage found this month was floating Kratongs, plus paper, foam, banana husks, banana leaves and coconut shells, which floated in the water.

## 4.5 Consumption Lifestyle and Origin of Waste

### 4.5.1 Consumption Lifestyle

The consumption lifestyle of the riverbank community of Tupperng was quite different from the past. In the past, the villagers' own-grown vegetables comprised the food for consumption. Apart from rice, which was the staple food, the villagers usually grew their own vegetables; nearly all households had a small vegetable garden behind the house. In addition, they did not like buying vegetables from a market or grocery. If the villagers had a lot of vegetables, they usually shared them with their neighbors or relative, and also exchanged or traded vegetables among the households; this activity was locally called "Khuen."

The consumption lifestyles of Tupperng Community have changed because the villagers prefer foods from shops or fairs. Housewives used to be responsible for the family's meals. They usually bought foods from the fair, which was held twice a week, and claimed that these foods were cheaper. When they gained more income, they traveled to buy food at Srisamrong Market or Sukhothai Market, where the goods were better, but more expensive. In addition, if there was no fair on ordinary days, the villagers still bought foods from the village shops. There were 4-5 shops in the community; two of which were owned by the village headman of Village 1 (Moo 1) and by the Public Health Volunteer of Village 8 (Moo 8). The villagers said that foods from the village shops were usually more expensive than foods from the fair. Apart from this, female peddlers sold food in the village using various methods, for instance, riding a motorcycle with a big basket tied with a seat behind the rider, and some foods were packed in plastic bags hanging in front of the motorcycle. These peddlers sold products consisting of such ready-made foods as bagged soup, curry noodles, and noodles including fresh foods (pork, chicken, beef and fish), etc. Some peddlers rode motor-tricycles containing similar types of food, but in greater amounts. In addition, some peddlers also drove pickups, which had special characteristics, because besides fresh and ready-made foods there were also seasoning agents, such as shrimp paste, fish sauce, onions, garlic, and daily requisites, such as shampoo, powdered detergent, tissue paper, washing-up liquid, etc. The villagers usually called this kind of pickup a

“Movable Market.” In conclusion, the villagers preferred to buy foods from the fair because of the low price, freshness, and variety. A fair was held from 2.00-7.00 p.m. every week on Tuesdays and Fridays, in front of the Tupperng Sub-district Administrative Organization, close to the Tupperng Public Health Center. The merchants usually set up their shops by putting up a canvas tarpaulin as a temporary sunshade. In the case of small shops, the owners used large umbrellas, instead. The shops were set up on both sides of the roadway, with a concrete road down the middle. The area of the fair was full of smells and smoke, especially smoke from grilling chicken or pork. There were several shops at the fair, for instance, shops with ready-made clothes, daily utensils, seasonal fruits, grilled foods, ready-made foods, bagged soup, fresh vegetables, pork, chicken, beef, ice cream, toys and agricultural materials. However, the majority were food shops.

Food-buying decisions of Tupperng villagers depended mainly on the income of each household, so that, if the villagers gained more income, they would buy more foods, and these foods were more expensive because they believed that expensive foods were better than cheap ones, for example, meat, milk, eggs and fruits were normally more expensive than rice. If they earned a lot of money, the food cost might be the same or slightly increase but they would add the cost of other non-food expenses, such as clothes, clothing accessories, electrical equipment, telephone, or improving the house. On average, the food cost of each household was 60% of total expenses.

Besides family income, the consumption behaviors of the Tupperng villagers depended on the size of the family; if a family had many members, the amount of food purchased increased, but it was aimed at an abundance of food at a low price. However, there were still other factors, such as family members' preferences, age, and the amount consumed by each member. For instance, a family having sons bought a lot of food, emphasizing carbohydrate nutrients and pork, while a family with daughters would buy vegetables and fruit.

The group discussion revealed that the consumers' social status also influenced housewives' buying decisions. For instance, the housewives of village headmen,

members of the Sub-district Administrative Organization or deputy village headmen, would buy a lot of food to be kept in the refrigerator, especially pork, chicken, beef and fish, because these persons were highly respected and frequently welcomed a lot of guests, both villagers and public officials. Thus, their housewives had to prepare foods for these guests that emphasized dishes eaten with alcoholic drinks. Moreover, normally parties were held at these persons' houses, such as on the occasion of winning the traditional boat race, being the winner of the anti-drug competition between villages, winning in the local elections, or making a thanks-offering.

The increased changes to the condition of the Yom River seriously affected the lifestyles of the Tupperng villagers. In the past, the food supply emphasized the river because fish were plentiful and could be caught easily. The villagers who had no time for fishing could buy fish from the fishermen. However, the water quality of the Yom River was bad and consequently there were fewer fish. As a result, fishing was also reduced because it became more difficult, and the fishermen had to spend more time fishing. Thus, fishing equipment was modified for greater efficiency. One of Tupperng's fishermen said that, "*Strychnine and electrical equipment were increasingly exploited.*" (Mr. Reewat Rattanayam, Group Discussion, 2003). A large number of fish and other aquatic animals became extinct, so the villagers had to buy them from the fair or shops, instead. Most fish sold were from the fish hatchery, so that the villagers did not eat natural foods. In addition to the extinction of some kinds of fish, the remaining fish were not suitable for consumption in some seasons, such as winter, when the fish became sick from toxins, such as insecticides. Although most of the Tupperng Community was involved with agriculture, the lifestyle switched drastically from a rural to an urban society. Thus, prepared foods were increasingly consumed, and the food supply chain was changed. The increasing food-purchasing trends indicated greater dependence on markets.

Nevertheless, the Yom River was still the main source of food. The water in front of the Tupperng Temple was deeper than other areas. Fishing was one of the natural food sources, which was free. However, successful fishing depended on knowledge experience and of living along the river. Although money was valuable and

could be used to buy daily goods, the Yom River was still the food source for the poor. For instance, the villagers working as general employees, who had no constant income from stitching tobacco leaves, could live on fish from the Yom River; although fish were difficult to find, this was the most economical way.

The values and beliefs of the Tupperng villagers also influenced the consumption lifestyle. In the past, Tupperng villagers did not consume small fish because they believed that eating small fish would cause the community to starve in the future. According to the headman of Village 8 (Moo 8), another belief about eating a certain fish was that "*The villagers did not dare to eat goby fish from the Yom River because of the fabled "Golden Goby." They thought that Ms. Auay was reincarnated as a goby fish, so they dared not to eat this kind of fish.*" This was a general belief among the Tupperng villagers. In addition, they believed that food was the main factor for life, which gave them strength to do agricultural work. This was a true belief. Moreover, Tupperng villagers still believed that good, expensive and valuable foods had to be offered to the shrine of the household God, ghosts, and used in thanks-offerings, so that agriculture would be prosperous and their daily problems would be eliminated.

Tupperng Community was also influenced by radio and television advertisements. So, existing values and beliefs about food consumption changed in various respects, such as the notion that consuming instant noodles or chicken soup was good and cool. In addition, the refreshing-beverage was favored among the farmers; empty bottles were commonly found in the fields and around households. Some foods were specially cooked according to traditions and customs on merit occasions, such as the Thai Autumn Festival. These special foods were, for instance, Krayasatra and other desserts like three-man dessert, Khanomtian, white-red glutinous rice, crispy fried-rice, all of which were important symbols of Thai merit traditions. In the past, on the occasion of the Thai Autumn Festival, all Tupperng villagers gathered and cooked Krayasatra together, to offer the dessert to the monks. They stored it in kerosene cans for long-term preservation, and it was preferably consumed after finishing the daily farming. When it was near the Thai Autumn Festival, most villagers usually asked for help, because stirring a pan of Kayasatra took a long time and required the experience

of an aged person to confirm the quality. At present, the complex steps taken in stirring Kayasatra have faded away; all of the experts have died and the villagers no longer have time to cook it. Modern Tupperng villagers usually bought cooked Kayasatra from the markets, to offer to the monks and consume within the family.

The other traditional merit symbol of consumption on the occasions of Kathin's Ceremony, marriage, Mid-House Merit Ceremony etc. was curried noodles. In the past, the merit activity could be observed in "*soaking noodle flour*" because the villagers had to prepare it before the merit day. Previously, cooking curried noodles was fun because all villagers took part in cooking them. The young men and women met and courted each other during the cooking, which was observed by the adults. At present, cooking noodles has also faded, but consuming noodles still exists, since the villagers buy the noodles from the market instead of cooking them.

On important merit days, like the Buddhist All Saints' Day, Tupperng villagers prepared foods and desserts like bamboo-baked rice used for Bamboo Baked Rice Drawing Lots. Mrs. Tongchub talked about the food preparation, "*... the bamboos were prepared for burning; the sticky rice was also prepared; coconuts were grated; black peas and taro were put into the sticky rice. Apart from this, the villagers also cooked stirred dessert, which was very complex and required high degrees of patience, because a pan of dessert had to be stirred from morning to evening. Thus, the villagers had to work in shifts because they had to stir the dessert continuously or the dessert would be burnt. The stirring was done from when the flour was white until it became glutinous, dried and turned greenish. So, the villagers' arms were completely exhausted from stirring the dessert. Moreover, nearly all households cooked three-man dessert and red sticky rice.*"

In the Tupperng community, during religious (merit fair) festivals food was also prepared utilizing meats. People simply called it "the fall down of cows and pigs". This ritual was conducted during special events and was considered a symbol of a significant fair, particularly during priesthood festival fairs, wedding fairs, or house-warming ceremonies. Buffalo meat and pork were recognized as good foods and represented the



status of the hosts. The meat was cooked as a dish that would go with wine or whisky during a dinner party.

For the majority of people in Tupperng, the value of the community was based on the belief that the leader, or the head of the family, was a person to whom other members should exhibit respect. For those who worked on farms, these people would be recognized as someone who was stronger and would work harder than other members. Therefore, there was a belief that they deserved better food than the other members of the family. One interesting comment from Lunthom was that *“when the head of the family went out for work or elsewhere, and we knew that he would come back late for dinner, we would prepare good food for him to have when he came back. We would cook different food for the head of the family; it must be special compared with other dishes”*.

People in Tupperng preferred not to drink milk, as they believed that milk was for babies, the elderly, and people with ill health. When anyone in the community got sick, people would visit the patient and bring milk along with them. They thought that milk would help the patient to get well more quickly. In fact, people here preferred not to drink milk at all, because it would reinforce the ideas of being ill and old. Thus, most people would turn to a nourishing drink, especially for those who worked on the farm. They believed that this kind of drink was essential, as it would provide them with more power and more energy to work. All over the area, drinking nourishing drink became part of their values and their way of life.

#### **4.5.2 Relationship between consumption style and garbage**

The lifestyle of the people in the community was increasingly related to land transport and the market system. Due to difficulties related to isolation, the people had to be more active to complete different activities in a limited time. As a result, most people did not have time to cook for themselves, and this encouraged them to buy food from food shops or from the country fair. The housewives were responsible for buying food for the family, mainly from the country fairs, which were open 2 days per week. Purchasing food from food shops or the country fair resulted in the accumulation of

rubbish, especially from plastic bags that contained the food they bought. Farmers would go out to work in the early morning and had to rely on the food that they purchased from the market. This new market system generated a lot of waste packaging materials from consumption of goods. Everything they bought from the market or stores in their communities was packaged in this type of material. Many items were made of this unusable material: “There are so many of these plastic bags. They keep coming every day, and there will be even more tomorrow. We keep a lot of them, but we have to throw away the dirty ones”, Thongkum (in a group, B.E. 2546), said. These materials were neglected and became a problem.

Most people in Tupperng preferred to buy pre-cooked food and household products from the local stores or markets. As a result, the packaging materials for those products were left as rubbish, creating a problem in the community. Simultaneously, there was a labor pool to weave tobacco leaves in the community, which reflected changes in relationships within the community. In conjunction with this non-local infiltration, the economic system was a factor that helped determine the way of life and behavior of the people in the community.

The characteristics of economic development effected numerous changes in most aspects of community life, especially the way people consumed food and goods. All of these aspects connected directly with the increase in rubbish in the community. The quantity of rubbish had an effect on community development. In other words, people’s behavior and their involvement with the communities should focus more on how to control the level of rubbish from the past, as this problem could be solved within a short time. However, the structure of the community was complicated and people who were part of the community came from non-local areas, so there was an increased level of rubbish. These newcomers changed the social structure of the people who initially resided in the community. This behavior affected the waste elimination process of the community.

The people of Tupperng prepared food and sweets to offer monks at the temples on festival days. Most of them would prepare and select only good food to take to the temples. They would quickly return home after taking part in the offering of food and after having received their blessing from the monks. A lot of food was left over, only to be thrown away; some of it was fed to the dogs at the temples. Much of the leftover food would remain and create odor problems. Some people showed good intentions by throwing it into the river. Their actions helped keep the temple clean, but they did not appreciate that they were contaminating the river. Moreover, the materials used to package the food offered to the monks were difficult to destroy and were eventually thrown into the river. This increased the level of refuse.

During the religious (merit & virtue) festival in Tupperng, people would prepare food in much greater quantities than normal, and this included the ritual of “the fall down of cows and pigs”, which was considered to be grand and significant. Examples included the priesthood festival fair, wedding fair, or house-warming ceremony. The preparation of as many different types of food as possible would emphasize the status of the host. As previously mentioned, the food was cooked to complement wine or whisky during a dinner party. There was always a lot of leftover food, which was left behind and scattered, resulting in an unpleasant odor. Incorrect management of this problem would increase the long-term effects on the environment. It could be seen that dogs were constantly at the backs of the kitchens, tearing up and spreading the rubbish. In the religious (merit & virtue) festival, there was always a large quantity of leftover food, and only some of it was fed to pets. It was evident that the warmer the temperature, the faster the food would decay and produce an unpleasant smell.

Economic growth had an impact on the lifestyles of the people in the community. These changes led them away from a simple way of life, based on relying and caring for others in the community, into a new and complex social lifestyle. These modern influences encouraged them to rely mainly on the market system where produce was sold. This factor led to the rubbish problem. The River Yom became a convenient place for them to dispose of their waste, close to their houses and free of charge.

## **4.6 Sanitation and Hygiene Environment in the Community**

### **4.6.1 Water for consumption**

Tupperng community is an agricultural community, and growing tobacco is the main occupation of its people. Modern development changed their traditional way of life and community systems, especially clean water used for drinking and other purposes. Since B.E. 2534, the Public Health Department supplied tap-water to the village on the western side of the Yom River, close to Saring Bridge, Moo 1, opposite Tupperng temple. This settlement installed taps for clean water for all of the houses in Tupperng District. This utility helped people in the area have clean potable water throughout the year. This benefit made life for the people in this district more convenient, allowing them to utilize tap-water rather than water from the Yom River.

The tap-water installed in the community was mainly for household use. People still had to utilize water from natural sources, such as the Yom River or local wells, for agricultural purposes. Using water from natural sources would have environmental effects on the food chain for the people, such as the fish in the Yom River. Furthermore, it would take some time for the people to adjust to tap-water, because they weren't quite familiar with it. They were also reluctant to drink the water from the taps because of the smell of chlorine. The rainwater or water from local wells seemed to taste better.

The tap-water system was (first) run to Somnuk's house, the leader of the village. The people in Tupperng community had access to this water system service, as well. In the beginning, people were not familiar with using tap-water; they still used water from natural sources, such as rainwater or local wells. They did not rely on tap-water as they thought that it was pumped from the Yom River and contained chemical additives, such as chlorine. They thought that it wasn't clean enough for drinking. Furthermore, they had to pay a monthly fee for the tap-water service. In keeping with their traditional lifestyle, they utilized water from their local wells or clay pots in which they caught rainwater around their houses. The benefit from the tap-water was quite limited, mainly for cleaning purposes or other household use.

The exchange between the village and the state government through the tap-water service affected the Tupperng community in two ways: the location of houses built farther away from the Yom River, and the settlement of new groups of people. This was because there was no more reliance upon the water from the river. Houses were located away from the riverside. The ways they used water individually caused them to lack ways to manage the water. Furthermore, the newcomers were able to establish their houses with no relation to their neighborhood or houses with wells in them. The numbers of houses being established were increasing and their inhabitants were involved in tobacco farming.

Previously, water management was seasonal. Within the society, all of the water from natural resources matched water usage throughout the year. For example, they would use the wells by the Yom Riverside during the summer, wells at their houses or the temple during the rainy season, and as sources of fish in winter. The use of water within the village was an issue of social relationships among houses, which were in separate groups in that region. There was also a communal well for the people in Moo8.

The arrival of the tap-water utility affected the Tupperng people's attitudes quite a lot, because the tap-water was not pure water from natural resources, but water from the river that was mixed with chemicals. What they did not understand about the water quality was that the tap-water was pumped continuously, which conflicted with what they used to think, that it was not suitable to use water from the Yom River because water was muddy or brown in color. They used suitable water from other sources. These water management practices indicated that the people used water in tune with the seasons rather than depleting permanent water resources. Furthermore, the water sources were also sources of food.

Every house built a bathroom instead of bathing in the Yom River. Tupperng people would drink cooled bottled tap-water from their refrigerators, which was taken from the village tap-water. As the temperature in Thailand is normally quite warm, most preferred to drink cooled water from the refrigerator to quench their thirst. Some of them, the wealthy ones, would drink bottled water. For other purposes, they would

use tap-water from the village. However, they still used water from the Yom River for washing, especially the farmers, who preferred to wash their clothes, farming items, such as insecticide containers, and fertilizer containers, in the Yom River. Some of them used water from the Yom River to water their plants. Hence, the role of the Yom River still remained important.

During the rainy season the water level in the Yom River rose. The water would be muddy brown so people would not use it. In the summer, the water level would be lower and look much better. Furthermore, people would use water from the well, which was another source of water for communities in the Yom River area. They would excavate a well and let water seep into it. The water would filter through the sand and be clear. They liked to drink this water because it was delicious, and some of them said that it tasted better than the tap-water in their houses.

They would put water into dragon-patterned jars, which was their traditional way of life prior to the establishment of the tap-water system. Large jars could still be observed in the communities, but the need to store water in them was decreasing. Some houses left them empty without storing any water, as it was not necessary to do this because tap-water was now available in the communities all the time. The group discussion revealed that sometimes the community tap-water system did not work, which may be attributable to the treatment system. When this happened, people turned to the water from the Yom River again. During the rainy season, higher water levels in the Yom River caused flooding of houses and farms, and destroyed a large area. The water treatment plant located on the Yom riverbank was inoperable and unable to distribute water to the communities. Sometimes it was not able to operate for nearly a month. People had turn to the Yom River for water. “When tap-water didn’t work, we would put water from the Yom River into the jars and stir with potash alum, let it sediment and then the water would be clear and drinkable” said Lek Jumkud. People in the Tupperng community believed that clear water was usually clean and potable without boiling.

Today, people usually neglect rainwater; only a few families would collect rainwater to drink as the influence of the tap-water supply obscured the role of rainwater. They usually thought that rainwater was dirty and was contaminated with dust as it flowed from the top of the roof. So they did not like to drink it. It also took time to collect rainwater and it was inconvenient to prepare containers for collecting it.

It was observed that families liked to use tap-water for washing clothes, dishwashing, and bathing. Water from these activities would drain directly from the houses onto the ground. Farmers usually washed their clothes after they came back from the farm; these clothes were usually contaminated with mud and insecticide solvent. They usually began washing these contaminated clothes in the Yom River before returning home to bathe.

Tupperng people usually built a shower and toilet together into one unit. When they bathed, the wastewater from the toilet would drain into the ground and form a small pit of water beneath their houses. People called it “Nam Krum”, black-colored water with a slightly unpleasant smell. Chickens always came there to scrape for food. The people in the community had no idea how to deal with this water and just let it dry up naturally. Some people would dig a trench and let it drain into the river. This trench was a source of *Aedes* mosquitoes, which were a major problem in this community.

In the past, Tupperng people usually washed their clothes on the riverbank prior to bathing in the evening, and let them dry overnight until the next evening. After that they would fold them. Nowadays, they have washing machines, and the way of life, washing their clothes at the riverbank, has changed. In addition, to wash contaminated and dirty clothes, the washing water drained into the ground and was added to the Nam Kum; this was similar to the other household activities. In conclusion, there were 4 types of clothes-washing here; 1) washing dirty clothes at the riverbank, 2) washing outside the house, where people would use 3-4 wood boards paving the floor, with jars located in the same area for various washing styles, 3) washing on the house, and 4) using a washing machine which they would put near their toilet; it was not popular to put it beneath the house as they were afraid of thieves. All of the water drained from washing activities would drain into lower areas of the house without better management.

The wastewater that created the biggest problem was from dishwashing or from the kitchen, as it drained off every day and flooded, forming “Nam Kum”, which emitted an unpleasant smell because it contained a lot of organic substances. Next was wastewater from farm tractors, contaminated with oil and mud; in addition, other types of wastewater came from toilets, bathrooms, and washing machines.

#### **4.6.2 Toilet behavior**

In the past, people in the Tupperng community used their toilets in an unhygienic manner. Uncle Mee said that in the past, during the night people liked to excrete into the river, and did so in the field during the day, because they did not like to use restrooms. The early toilets were called “Suam Block” or “Suam Lum”, which were made by digging a square pit and placing wooden boards on top to squat on. The body of the toilet was made with materials from the local area, such as coconut leaves, lamperata cylindrical or zinc-coated iron. The cleaning materials were bamboo or newspaper, including used books. A “Suam Lum” or “Suam Block” was often located near a bamboo tussock or by water’s brink, but some people just dug a hole and covered it up after finishing their business.

Toilet methods changed dramatically when an important announcement was made. A provincial policy urged sanitary toilet use to reduce the spread of diseases. Campaigns were publicized to support using toilets in all households, starting in B.E. 2537. Tupperng District responded to this provincial policy. Meanwhile, the head of the village, village shift and public health volunteers came to encourage households to have their own toilets by providing low-interest loans from the village fund with a long-term, 0% interest period. The governor announced the policy and had the village shift, and the head of the village implement it for all households, and awarded medals to the districts where there were toilets in every household. In earlier times, elderly people did not like to use a toilet, and claimed that they would had more freedom when they excreted in the tobacco field, because it was more convenient than building a toilet room. They also claimed that they felt uneasy and suffered from bad smells, claustrophobia, and inconvenience. In the tobacco fields, they could just dig a hole and cover it up after they had finished. They could do this at any time. It was easy to find



cleaning materials, such as newspaper, coconut fiber, small wooden sticks, or tissue paper. Later, they started to adapt and nobody liked to use the field anymore. All families used their own toilets, because it was more convenient. Another supporting factor was that household tap-water made it more convenient to use the toilet, which needed water for flushing and cleaning. Wealthy families would build their toilets in their houses, while others would build them underneath their houses. The sanitary ware also indicated the status of the house owner. For example, wealthy homes would build with brick and mortar, while others would build with local materials, such as zinc-coated iron. People liked to build them in the bathroom.

Toilets and sanitary ware were new articles and affected the ways of life of the people. New habits were developed and continued as normal methods of dealing with the excretion of people in the community. This was very important for living together in the same society. The change in such things reflected their way of life. Their attitudes had been changed from excreting in the forest, in the field or near the house, to excreting in a toilet.

Using a toilet supported the hygiene-care concept, to keep the people of Tupperng clean. They knew about public health and sanitation from the staff officers, who insisted upon the importance of cleanliness and disease prevention. The toilet became an important element of public health that people should take care of. It was also an indicator of the quality of life of the people. The public health staff dealt with the excretion issue in a systematic way, which targeted the Tupperng people's health and ensured their awareness of it.

Toilets and sanitary ware were things people used to show off, and the ego was an indicator of a developed life in the people's point of view. Living with convenience and luxury among such items clearly distinguished the rich from the poor. A more beautiful toilet and sanitary ware made them proud and speak more loudly in the community.

To have a toilet was an interesting new concept, which changed the behavior and attitudes of the Tupperng people. Using a toilet and sanitary ware nowadays seems to be a normal practice, as if it was always their habit; “One should excrete in the toilet” and “bathe in the bathroom”.

According to the new concept of accepting the toilet and sanitary ware, the past behavior was thought to be shameful, unhygienic and wrong, and conflicted with the community’s rules. It took time to accept the need to change hygiene behaviors and feel indifferent to the new arrivals.

The new idea about toilets and sanitary ware affected and changed previous behaviors that followed the natural framework, customs, and beliefs. The normal practices that were changed accompanied the needs or consciousness of the people in the community.

During phase I of the health and hygiene behavior changes, the Tupperng district organization management enforced a code for every newly built house to have a hygienic toilet, otherwise they would not provide a house number. This code was still unable to change the attitude of the people. The people tried to find a loophole to elude the house rule as they thought it was unnecessary. However, recently, the regulations accelerated the changes described above.

The school education system was an ideal framework for the Tupperng people who were able to change their attitudes and adjust human behavior. The school pointed out the benefits of excreting in a toilet, to understand the benefit of concern for health and protecting them from epidemic diseases, and to create values and a new vision in the society. The new attitudes towards cleanliness and health matched the new value system for primary student classes, who then passed the information on to their guardians.

In addition to education in the school, officers from the Public Health Department educated the people about excretion. By mounting a campaign, Public Health Volunteers also recommended ways to use toilets hygienically.

In regard to development concepts, it was the way to progress, improve the standard of living, safety, and deal with the toilet use issue. Assistance was provided by the Provincial Public Health office to set up a program, “100% Provincial Toilets”, in which the aim was to successfully change the behavior of the people. It acquainted the people with the benefits of using a toilet. Mechanisms from the state, education, and development would be an accelerant, which would drive a new acceptance or culture. Thanks to urban expansion, people were wealthy and had enough income to respond to the new ways of life. Follow-on ideas emerged, as well as the expansion of urban culture into the Tupperng community.

In addition, public relations made announcements through several different types of media and affected many different people in various class groups. People who knew the role of the toilet acknowledged that toilets and sanitary ware were hygienic and necessary. They did not want to be a small part of society and wanted to be proud and show that they practiced good hygiene. Although Tupperng people had hygienic toilets in all of the houses, incorrect modes of wastewater management, from the toilet or bathroom, still remained.

Most of the toilet water was the result of bathing, and it drained directly onto the ground on the Yom River. Some houses had pits underneath containing stagnant black water. Such water turned even more acrid when chickens came to scrape these pits. These pits were also a source of mosquito growth. Most toilets contained two reservoirs, the small one was for cleaning toilet waste, and the larger one was for bathing. Both reservoirs were installed close together. Tissue paper and other materials were used as substitutes for water. A mobile stool removal service was also available in the village and charged a rate of 400 Baht/time. The “stool-sucking truck” was the name given to this vehicle. Actually, there was normally only one toilet room per house. Houses with better positions or status would have two toilet rooms, one on the second floor and one on the ground floor.

After use, tissue and newspaper would be gathered and burnt. Some of it might be thrown into the toilet bowl and flushed with water. The body of the toilet bowl would of the squatting type, as people used to squat when they used the toilet. Some houses with elderly people or higher status would use a flushable toilet. In addition, the design or the materials would differ depending on household income. Houses with lower incomes would use simple materials. The conventional type would have contaminated water, which made the toilet room dirty, or the contaminated water would flow and drain onto the ground. However, the flushing toilet would not. Most of the toilets in the temples and schools were of the squat type, which required pouring water, not a simple flush. The student lavatories in Tupperng School were of the squat type. Students in the school were scheduled to clean the toilet room. When there was a temple fair, traditional fair, priesthood festival fair, or Kathin fair, people would use the same toilets. These toilets were built close to the balcony on the same level as the temple hall. Sometimes there were only 8 rooms, which was not enough for the people, and they had to wait in a queue. Since many people were using the toilets, it caused flooding that ran down to the lower floor and then flowed into the Yom River.

#### **4.6.3 Waste from houses in the communities**

Traveling along the road to Tupperng, through the village and along the Yom River, houses could be observed along both sides of the Yom River. These houses were close to each other, without fences. Away from the Yom riverbank were fruit gardens, and then residential buildings. Along Yom River road there were community shops, and the places where they used to dump garbage could be seen. At the foot of Saring Bridge, between Moo 1 and Moo 8, people used to dump garbage into the river. Some of it was left on the riverbank. Many houses dumped their garbage in these areas. Most of the rubbish was plastic foam, paper, and leftover fruit. From Saring Bridge to the north along the Yom River road, for about 10 meters, garbage was dumped into the river and some washed onto the river bank. The area nearby is a multi-purpose hall, bamboo tussock area along Yom River, where a lot of garbage, especially plastic bags, were floating and clinging to the bamboo tussock. Garbage was also dumped behind the temple area.

Garbage could also be found in the community's residential area. Many houses did not remove the garbage. Many of them dug a large pit for burning the garbage. Some houses tied the garbage bags and left them behind their houses awaiting disposal. Observation of the residential buildings showed that most of the garbage would be at the back of the house or in the kitchen area, since the inhabitants usually dumped the garbage when they cooked. Most of garbage consisted of plastic bags, paper, banana leaves, and rotting vegetables. This was because they preferred to build the first floor off the ground to protect the house from flooding (since they were near the Yom River). Another reason was that they would use the ground floor for storing tobacco. So, untidiness could be observed on the ground floor, unlike other communities. The garbage left on the ground floor was neglected. "This area is unable to look as clean as the other does. We cure tobacco and have to dry it on the ground floor. It looks untidy and it is very difficult to keep the garbage away, plastic bags always fly in here, we seldom clean the floor, and we have to duck when we sweep the ground floor area" said Somchai (Focus Group, B.E. 2546).

Considering the Tupperng the community's way of life, when the tobacco industry flourished, the way of life of the people changed. For example, they used to have dinner together, but nowadays they have to eat more quickly, because they have to go to work, so they buy prepared food instead of cooking themselves, to save time: "*Eat dish soup, come to eat packed soup*". Many houses used washing machines instead of using traditional methods that wasted time. The role of money became more important as they relied on the market system. Their cooking skills were also decreasing as they farmed tobacco: "*All together in the family, we used to cook sweet food, cook steamed-glutinous rice wrapped in banana leaves. Now we have to farm tobacco, and we have no time for cooking or making sweet food,*" said Sanong In-Tim (Focus Group, B.E. 2546).

In addition, various daily activities produced a lot of unwanted items. Many shops were unable to dispose of their refuse like the houses did. On average, they had several kilograms of garbage between 10 shops (80% of it was food). These shops would dump their garbage in vacant areas near the Yom River. Wherever one shop

threw garbage, the other shops would follow. The garbage piles grew larger and larger until they were unable to be burnt all at once. It looked untidy and emitted a bad smell, annoying the people in the area. This area was uncultivated because it was easy to throw garbage there.

**Table 4.5 :** Composition of the garbage in Tupperng community

<b>Constituents</b>	<b>Ratio (%)</b>
Leftover food	60.0
Plastics	35.0
Paper	4.0
Metals	1.0
Total	100.0

Source: Observation and separation of the riverside garbage

In addition, not only the shops would dump their garbage on the riverbank, but also the schools. Such schools would bring their garbage and leave it in a back area and also at the Yom River. Garbage from the school contained higher plastic and paper matter, as these materials were from students' food packaging. The janitors would pile them on the Yom riverbank or behind the school and burn them. However, they were not completely burnt and were thrown into the Yom River.

**Table 4.6 :** Composition of the garbage in Tupperng schools

<b>Constituents</b>	<b>Ratio (%)</b>
Leftover food	10.0
Plastics	70.0
Paper	18.0
Glass	8.0
Total	100.0

Source: Observation by local research team

In addition, to the shops and schools, the most came from the community. The community's garbage was left at the Yom riverbank. From observation, 6 garbage piles were found on both sides of the Yom River. All of this garbage was in Moo 1 and Moo 8 of Tupperng community area, near residential areas, shops and schools.

It was clearly known what Tupperng people meant by barrages; they meant the garbage that was thrown into the Yom River, and also the garbage piled on both sides. *"The garbage? It's a problem. One pile is at the foot of the bridge on the way to the temple, one is at the front of the temple hall",* (Somnuk) or *"One is close to Bum's house, you see, on the left over there, they were still on the riverbank, all were in the water",* (Samarn), and still more *"One from the school was left at the back of the school, that is, after a long time they will burn them once; the janitor always pushes them into the river"* (Subin).

When we walked into the village, we would sense the smell of tobacco spreading throughout the village. During the tobacco-cropping period, people both young old and were hesitantly weaving tobacco leaves. The younger ones would go cropping the tobacco on the farm and move the leaves into their houses, so they did not have time to dispose of the garbage.

From observation, the places where garbage was being dumped into the river are shown in appendix B.

### **The meaning of garbage from the people's perspective**

Garbage was always to be found beneath the houses in these communities. The riverbank revealed the location for burning the garbage. Most were pits filled with garbage to be burnt. According to one discussion group, waste in the people's opinion meant whatever was absolutely useless; such as scraps that were unwanted, what we excrete from the body, equipment that was inoperative, animal corpses, rotten fish, dead chickens, and dead dogs. These are what they called "waste". Things that are completely unwanted such as fallen leaves, rotten vegetables, and plastic bags that could not be reused. These are what they call "garbage". Two types of garbage were

found in Tupperng community; i.e., 1) sellable (recyclable) garbage, and 2) unsellable garbage. The sellable garbage consisted of paper, beverage cans, beer bottles, plastic water bottles, paper boxes, small pieces of leather, rubber tires, and old shoes. Garbage that was not recyclable was leftover food, leftover vegetables, clothes strips, dirty plastic bags, foam, broken glass bottles, batteries, rock/sand, electric tubes, insecticide cans, tile chips, baskets for vegetables, ruined woven baskets, etc. Mostly the garbage here was composed of many types and quantities of materials depending on the house, economic status, and way of life. Tupperng people said that, in the past, most of the garbage was leftover food, leftover vegetables, and fruit, which were thrown into the river to feed the fish and crabs. If some was rotten, it would sink into the river. Nothing would float, unlike what was evident nowadays. The quantity of garbage grew corresponding with the population. Contemporary garbage is different in type and quantity from the past. People buy more, they eat more, and it generates more garbage. They bring garbage back when they return from the market, and it is mostly plastic bags. In the past, life was very simple; they took a basket to go shopping and carry their food, while now they use plastic bags. The way of life is more complex; it is not as simple as in the past. It creates different garbage ingredients, most of it is imperishable, for example, rubber tires, plastics, glasses, foam, etc. Most of the garbage in Tupperng community derived from kitchens, such as leftover vegetables, leftover food, and plastic bags. The garbage varied seasonally, from vegetables in winter, leftover fruit in the rainy season, and all types and quantities in the summer. Especially during the Songkran festival, it could be observed floating on the Yom River.

In the past, the Tupperng community had engaged in recreation in/on the Yom River. Bunlue said *“When I was a child, people here liked to paddle along the river and draw clear water from the river and bring it for drinking. The water was completely clear, sweet and clean. Presently you cannot drink it. You get dirt from the water”*. People said that wastewater comes from people throwing garbage into the river. You would not have seen this in the past. Most of it was rotting dogs and chickens, and when they floated near the house, they just used a wooden stick to push them away.



People said that the garbage floating in the Yom River was not solely from the Tupperng community, but from other communities, as well. It stuck to the riverbank when the water level was low. Throwing garbage into the river was regarded as a normal habit.

### **Recognition of the garbage problem**

People in Tupperng realized that garbage was a major community issue that all people should solve, or it would persist. They had to realize that perishable garbage, such as leftover food, would create water pollution. Trash that is buoyant should not be thrown into the water. Previously, there was a campaign asking people to clean their ground floor and not throw garbage into the river. Garbage that is recyclable should be collected and sold to secondhand merchants.

One group conversation showed that people agreed some houses generated more garbage than others. The community should play a role in reducing the problem by separating the trash prior to disposal. This would reduce the quantity of garbage. Tupperng people should play a role by separating their refuse, to use products that are difficult to eliminate, and try to select natural materials. One conversation group discussed garbage separation. Their concept was to separate recyclables from non-recyclables. However, in theory, that meant separating what is burnable and what is not. People separated refuse for reuse, and to sell it to earn money for their families. In theory, separating the refuse would make it easier to eliminate. The solution to the garbage problem needed to match the lifestyle of the people, otherwise it would be a continuing problem.

### **Garbage management behavior of the Tupperng community**

#### *Separation at household level*

Tupperng community's people separated their garbage by themselves every day, only with the aim to sell the recyclables. They separated it into 2 types: garbage that was sellable and that which was not. The latter was wet garbage, leftover food, leftover vegetables, etc. They did not mind such garbage. The garbage that was sellable, for example, glass and plastic bottles, and paper, were usually set aside and sold to

secondhand merchants. The current price for paper is 2 Baht per kilogram, and plastic bottles sell for 6 Baht per kilogram. The purchasers came to buy the recyclables every week and most of them were people in the Tupperng community. In addition, most of the garbage from the Sunday market was leftover vegetables. Some vegetable sellers would separate this type of garbage and bring it back home to feed the pigs. Educated people or people with higher status would separate the garbage and put it into separate bags prior to bringing in the garbage tank from the city.

### **Reuse of materials**

Some people would recycle materials, and most were plastic water bottles. Some refilled the water bottles and put them in the refrigerator, and some reused plastic bags, detergent containers, and paint buckets, which they cleaned and reused. Several people said that it was safe to do this. However, many people were not confident about the cleaning and believed that reuse was unsafe.

People also repaired tables, chairs, and used newspaper to wrap fragile articles such as glasses and bowls, prior to storing them in a case. Some used them to make paper bags. They also used fertilizer bags filled with sand as protection from flooding, or used to fill them with dry animal excreta for storage. They also used cans and pots to grow trees or cultivate tobacco.

### **Garbage recycling**

Some houses used to convert used materials for reuse; for example, they cut down plastic bottles and grew water plants in the bathroom. Getting the most from plastic bottles was a way to save instead of buying new ones. Some cleaned detergent boxes and reused them as rice storage boxes. Some reused fuel drum as trashcans, and some reused wheels from farm trucks as cattle feeders. Some housewives put fish sauce or spices into nourishing beverages.

### **Avoiding materials that increase garbage**

People in the community thought that it was convenient to use plastic bags, since there were no other materials that could substitute for them. They were unable to

use banana leaves to wrap liquids. Some houses paid less attention to avoiding materials that created garbage. A lot of plastic bags originated from shopping at the market. They thought that plastic bags were convenient and did not object to using materials that would create garbage.

### **Attitudes to the garbage problem affecting the water quality of the Yom River**

One conversation group found that people along the Yom River knew what wastewater was. They knew that it was black, dirty, had bad smell and was polluted with garbage. Fish would die if the water were bad. Talking about the particulars that caused wastewater, they concurred that household garbage and the water caused the stale water from houses that drained into the Yom River.

Problems resulting from the stale water in the Yom River included the bad smell, filth, death of aquatic life, pink eye, and diarrhea. When talking about the Yom River status, they expressed the opinion that it was fine, even though some people argued that it had a bad smell and there was a lot of floating garbage. In discussing the possible solutions to the problem of stale water in the Yom River, some said that there should be a law against polluting it. Some felt that it was necessary to make the people along the Yom River aware of how to solve these problems.

There was no official group at all to deal with the stale water issue. However, some people, such as the village head, the abbot, teachers, etc. tried to push the issue of garbage management from time to time. Although the people paid little interest to the community's garbage problem, several households failed to understand the causes and effects of the problem, so that it was not possible to form a working group to manage these problems directly. This reflected their awareness of paying attention to the problem and creating a mentality in the community to utilize the correct methods, leading to eventual action.

#### **4.6.4 The Yom River, source to eliminate waste from the community**

The Yom River originates in Phi-Pun-Nam and Dan-Lao hill in Phayao, Phrae and Chiang Rai provinces. From an altitude of 1,600 meters above sea level, it flows through the northern part of Phrae to the lower area of Sukhothai, Phitsanulok, and Phichit, and combines with the Nan River at Chumsang district, Nakhon Sawan Province. It then flows into the Chao Phraya River at Pak-Nam-Po, Nakhon Sawan Province. It is 555 kilometers in length (Board of National Environmental Committee: B.E. 2536). There was no evidence of stale water in the river in these areas, only a flooding problem in Bang-Ra-Kum and Srisumrong district. Within a short time, natural fertilizers accumulated in the soil and provided good agricultural productivity. Flooding of the rice farms brought in many organic substances. However, with the passing of time, all the changes turned in a negative direction. Over a period of 50 years, the fish and aquatic animals dwindled, as a result of declining water quality, which reduced all of the aquatic animals. Another problem was turbidity, and chemical and microbial contaminants created lower standards of water quality. This affected the fishermen in those areas, who suffered from recurring epidemics of water-borne disease.

The increasing population over time forced the communities to expand along the riverside, and economic growth produced daily activities that released a lot of wastewater directly into the Yom River. In addition, people were not conscious of preserving the water source or the water quality, resulting in stale water and contamination of water sources. Another problem was over-consumption by using inappropriate methods to hunt aquatic animals. This caused an ecological imbalance. However, the Yom River remained the principal river, covering an area of 23,615.59 square kilometers. The people in the lower northern region benefited either from consumption, or from fishing or agriculture, which were their main occupations. In drought or dry conditions, the water quality deteriorated, and the Tupperng community played an important role in this situation.

The water level was higher in July, with flooding in August and September. Water from the Yom River would overflow into the canals people called “Num-Kun”. Samarn described this situation: *“It floods all over the area, and the level reaches the second step of my stairs”* (Samarn, Conversation Group, B.E. 2547). This occurred about 2 months every year. People called this situation “Num-Dang”. Water would flush everything in from the north--garbage, leftover plants, leftover animals, mud and soil. People called this substance “Sawa”. It floated and got stuck underneath the bridge area and blocked the water flow. Some of it was logs, wooden sticks, and garbage. Sometimes it would damage the bridge and people would have to remove it as quickly as possible. When there was a flood, people would separate the things that came with the Sawa and put them up for sale. *“We can collect garbage beneath the bridge: 50 kilograms a day, there are wood scraps, plastic bottles, and we get quite a lot of money from selling them”*. In Sukhothai, people felt that it was a natural part of life, because it flooded every year. When the water rose, people along the riverside would prepare to collect their goods and move them to a higher level, away from the water. *“Flooding, sometimes it’s good; we were able to get fish as they would lay eggs in the rice farm, they would grow up and return to the Yom River after the water was lower. There would be more fish”*.

The problem of garbage and waste also brought other troubles. *“In the rainy season, it normally floods for a month. It made it difficult for us to stay. The water reaches floor level, and sometimes we have to sleep on a beam, or some nights we sleep in the temple hall, or in a tent on the road that the district office provides; we cook on the road in the village, and row a boat along the main Sukhothai-Srisumrong road to ask for drinking water”* (Payup Kumjud, Conversation Group, B.E. 2547). Everyone would temporarily gather at the temple hall until the water level fell. During this situation, people usually excreted directly into the river, as toilets were unavailable (the water was not able to run). In the meantime, people with higher-level floors were able to stay in their own houses, but they still excreted through a small hole in the floor to the water below. All garbage was thrown into the water.

When the water level lowered, it was found that a lot of garbage came with the flood; things such as glass bottles, metal boxes, leather pieces, stayed on the river bottom. Some people dove for these things to fetch them for sale. In the summer time, people would confront dry weather. People used sand bags to dam the water for washing, cleaning, agriculture, etc. The stored water usually stagnated, as it did not flow. The water would become stale when people threw garbage and waste substances into it.

In the past, people had used the Yom River and other branch canals to communicate with other communities, using boats as their vehicles. The purpose of transportation along the Yom River to Sukhothai City was to sell agricultural products. In addition, they would catch fish and visit their relatives who lived nearby. To the south, the water could transport them from Tupperng to Ban-Ja-Wed, Ban-Ta-Chang, Ban-Bang-Klong, Ban-Pak-Kwae and Sukhothai City, respectively. In the north are Ban-Wang-Yai, Ban-Wang-Thong, Ban-Nong-Kadee, Ban-Wat-Tung and Srisumrong City (Location of Srisumrong District). Away from Srisumrong is Ban-Nong-Wong, north of Srisumrong, which is home to a palace, or Wat Nong Wong, which was a well-known place where a traditional fair was held on the third month full moon every year. The 7-day/7-night fair was held to show respect for the holy priests, and was a tradition succeeding from generation to generation. Tupperng people liked to come to pay respects at this temple and used this time to visit the fair and buy things to bring back home. Boats were observed beneath some houses, since they seldom used boats at present; they used cars and motorbikes on the concrete suspension bridge to visit each other on both sides of the river.

Tupperng's concrete bridge eliminated boat transport between both sides of the river and replaced it with a land transport system. The bridge worked as a lifeless medium, impervious to time and season. The bridge permitted the people of both sides of Tupperng communicate more conveniently and faster, without relying on boats or having dealings with various occupational groups at the temple port anymore. What came with the bridge the ease and convenience to use the bridge for dropping and piling garbage, waste, leftover plant, leftover animals. In the past, they were able to drop it at

the riverbank, only some part into the river, some stuck along riverbank and along grass roots. The bridge helped the people throw it into the middle of the river.

In the past, the Yom River benefited the houses in communities along the riverside regarding consumption, transport, fishing, and agriculture. Today, the way of life has changed. The river has become the place to eliminate waste from the households. Lack of care over a long time made the river shallow and cluttered with trees. Uncle Somnuk Inpin, who had stayed on the Yom riverbank for nearly 60 years, said *“This river, once the water was clear and clean as it flowed through from Phrae, we were able to use it for drinking, bathing. A lot of fish in the river. People around this area were able to row a boat to visit each other conveniently. But now there are no more fish; the river is not the same as it was. Once there was clean sand. People went down to bathe and drank the water, washing. But now it is dirty, the sand on the beach was dug out to make the river deeper, making it difficult to go down river”*. The Yom River is still the main water source for agriculture, but not for consumption, as they have tap-water in the village, which is distributed to all the houses. When the tap-water did not work, or during floods or a water pump was damaged, the Yom River became important again. People would take the water from the Yom River and stir in potash alum and use it for drinking. People believed that the water was clear when mixed with potash alum, making it drinkable. Very few would boil the water.

Mr. Somchai said *“In the past they did trading by boat, especially the Morn people; they usually brought their merchandise for sale in Sawankalok. I was told that the boat sank at Ban Tupperng around Kung Num Nue Tupperng temple. People dug up property in the dry (summer) season. They found a lot of coils, bowls”*. It was believed that the river was full of various aquatic animals, big lobsters (same size as blow). There were local fish that did not live in any other river, such as goldfish, buffalo tongue fish, and stingray, which have now become extinct. Uncle Virat said *“In the past there were a lot of Saitun fish, so that you couldn’t put your feet on the riverbed, but now there are very few”*. The fish in the Yom River had been plentiful after giving food offerings to Buddhist monks in the Taewo festival. People liked to catch fish by “Kut-Chont” and “Tee-Oun”. In the past, they liked to catch only Khao

fish and Kod fish, and released Soi fish back into the river. Chao told us *“The fish that are going to become extinct are Moo fish, Boue fish, Kod-Prame fish, Dang fish, Pak-kwaey fish, Lin-Ma fish, Rak-Kwaw fish, and Thong fish. It is very expensive, 200 Baht per kilogram, Lin-Ma and Rak-Kwaw are already extinct. But Kwo fish are coming back again. You can buy Kod-kaew fish and Ta-pien fish”*. The reason for their extinction was the fishing tools used, such as nets. The net holes were too small and all of the small fish got caught in these holes. Another reason was the water in the river, which was contaminated with weed killers that were widely used on both sides of the river. In addition, the water in some parts of the river was stagnating. Some people used strychnine, and these caused extinction of the species.

## **4.7 Culture, Traditions and Lifestyle Perceptions of Waste**

### **4.7.1 Lifestyle, culture and traditions**

Tupperng’s culture and traditions are the same as they are in the central part of Thailand, i.e., religious culture, occupations and lifestyles. However, they all believe in Buddhism so their activities are related to religion, especially the “becoming a monk festival”, weddings, funeral arrangements, and the merit and virtue fair for Buddhism, and special days, such as “Khao Phansa” and “Ork Phansa”. The temple is the center of all communal cultural and traditional activities.

#### **Becoming a monk**

The most important tradition was becoming a monk. The elders among the people would organize an impressive fair. People would come to join the fair for 3 days and 3 nights, from the first day (Suk Dip day) to start the fair. There were many plays depending on the status of the host; in fact, there was singing, movies, plays, (Likae), etc. People were mindful of this ceremony. Now the pattern of becoming a monk has changed. In the past, people would learn to become a monk at about 20 years of age, and would remain a monk for 15 days or one month; very few stayed on for 3 months, as they had to work or continue their studies. Those who were still studying had to complete their studies first, and were normally over 20 years of age. People who had already applied for jobs and did not get permission from their bosses to leave may not



be allowed to do so. So, becoming a monk nowadays is done only to follow tradition and for a short time, and is unlike what they had done in the past. Another thing that is very interesting about becoming a monk is that the number of monks in both temples in Tupperng district was very few compared with the population.

Normally, becoming a monk in Tupperng would take place in 7 or 8 months. There were two styles, Buad Nak Samukkee and Buad Nak Diew. Buad Nak Samukkee signified a lower status host or guide, who would let their sons become monks together with other sons, to save on costs. They usually arranged a celebration at the temple and shared the costs among the hosts. All relatives and friends would bring gifts and help with cooking, which they called “Entering the kitchen”. At present, they hold the ceremony at their houses. Actually, Tupperng people who were well settled would build a large house with a large space, which they would use for the celebration. In the case of either a wedding celebration or becoming a monk celebration, the larger the house, the better the celebration. Normally, they would set up this ceremony after getting money from selling their tobacco. The number of days for the celebration depended on the wealth of the host. Normally, the celebration would not be less than 2 days. The entertainment for dinner was called “cows fall down” “pigs fall down”. They would use this meat or pork to entertain the people who came to join the ceremony (celebration). A symbol of the celebration was to turn on amplifiers from the first day until the last day. The number of speakers and the louder the sound would reflect the status of the host, as well. If the host were wealthy and respected by the people, they would use a good brand of amplifiers for the celebration, differentiating from a lower status host who used lower quality amplifiers. There were several amplifier service shops in Tupperng; the most popular was “Nang Service”, which had excellent quality and very loud amplifiers. The reasons for which they used amplifiers at the celebration were 1) to show the people that the celebration was being arranged at this house, 2) for the cooks, since they had to wake up at 4 a.m. to start cooking, and 3) to entertain the celebration. It was traditional, to gain merit by telling people to come and join the celebration. Such people were divided into three levels. , In the first level, or close level, most were close relatives, and the host would invite them verbally without invitation cards. The second level was middle class, which most villagers were, and

they would be invited to the house with invitation cards. The third level were people who stayed far away, for whom the hosts would pass their invitation cards through other persons. This invitation method was called “Giving virtue”. The celebration was limited to only those who were invited, people without invitations would not come to join, but they could join in before the pre-monk entered the temple-hall period. That period needed no invitation, and it was understood that they could join in.

To become a monk of Tupperng relatives was to study religious discipline. People believed that it was like a lantern that would light the right way for people to go, and that if people lacked these principles, they could not efficiently solve their problems of daily life. Choosing the right way of Buddhism would enable them to solve such problems. After the period of being a monk, they would be able to apply these principles with their families. Buddhism taught people to understand unity, sharing with each other, and kindness, not to extort from each other, and to cleanse their minds, so that people could stay together in happiness.

People believed that, in becoming a monk, their sons would have the opportunity to do what they liked, believe in what they liked to believe and have the opportunity to study the excellent facts of the Four Noble Truths, which was a guideline for solving problems using basic wisdom. The principles would develop the mind, thought and wisdom to support living as an excellent person, being accepted in society, and being able to solve problems, depending on himself and helping others in the community and in other communities, as well.

#### **4.7.1.1 Weddings (Marriages)**

The wedding tradition of Tupperng community was another activity, that was believed to be a lucky or happy event, sacred and full of enjoyment. There were three types of wedding ceremonies in Tupperng community: the first was a wedding called “Suad Mon Suad Nam”, a full form of wedding with the desire of both sides. It was arranged and prepared for a long time of enjoyment, with both religious and traditional (past) ceremonies together with occultism and Brahman ceremonies, and the ceremony of pouring sacred water over the hands of the married couple, the Kunmark

ceremony, bringing the couple ceremony, etc. The marriage price (Sin Sod) depends on the status of the host, as well.

The second type of wedding is called “Wag Sen”, a simple preparation, since the couple was of inferior status. There would be no religious ceremony, no pouring of sacred water over the hands of the married couple, and people would just be asked to come for dinner to honor the event. A simple ceremony would consist of giving blessings and tying the couple’s wrists with holy thread by their respective relatives, and then the couple would receive money in an envelope, which was placed on the big bowl for their joint-living fund.

The third wedding type, called “tying the wrists”, was a hurried arrangement where one party did not consent to the marriage. It occurred as couples agreed by themselves to stay together, or after a rape. Then the man’s side came back to apologize to the woman, shown by tying the wrists and conducting a ceremony for the house ghost, for forgiveness. Pramuel said, *“My wife and I did the same since I was poor, and her father and mother would not agree. I had to take her away from her parents and came back later for forgiveness by tying the wrists. I only paid 3,000 Baht for the house ghost ceremony”* (Pramuel Thajun, Focus Group, B.E. 2546). Only close relatives would join in, and there would be no invitations for other people, since this ceremony was perceived as shameful to the host, especially the woman’s side.

#### 4.8.1.2 Traditions for deaths

The traditional death ceremony was also important for the people, to finally mourn a person’s death. A lot of people joined it if the dead person was a local. In the funeral rite, the host would prepare 2 buckets of water beside the furnace for the people to clean their hands after putting incense and Jun (artificial dry) flowers beneath the coffin, to clean their hands of disease or infection from the dead body. This was a belief from the past. The abbot of Tupperng temple (Pra Direk Thiiasriro Monk) said *“In the past, after the funeral, people would go and bathe in the Yom River to clean their bodies, otherwise the disease would follow them back to their house. Nowadays, we need only clean the hands”*.

#### 4.7.1.3 Traditions for religious days

People in Tupperng paid homage in religious day activities, for example, doing virtue on Khao Phansa day, Tod Kathin day, etc. People would join all of these traditions regularly. Especially during the Khao Phansa period, people would gladly go for merit and virtue at the temple. The old would make merit at the temple regularly. During the merit and virtue making in Khao Phansa, people of all ages, especially old people, would join in. People liked very much to join merit and virtue activities on Sathorn Thai day, Makha Bucha day, and Visaka Bucha day. Mostly, they would come if such days were public holidays or the days they were off duty.

The factors influencing their participation were their occupation and their free time. During the tobacco-cropping season, people joined in early in the morning so that they could go home quickly (sometimes they even had no time to receive blessings from the monks). The monks also would come to the temple hall early in the morning to respond to the people's showing respect. In addition, people of non-farmers would come to join only on religious days that fell on public holidays, especially on Saturday and Sunday, as students and government officers would have the days off. In the case of consecutive holidays, for example Songkran, people who worked in a large city such as Bangkok or Chiang Mai, would come back to visit their home town and arrange Pha-Pa for merit and virtue at Tupperng Temple. At such times, there would be various different people in the community.

Furthermore, to make merit and virtue on religious days, Tupperng people liked to prepare "lucky name" foods to give to the monks. For example, Thong-Yib, Thong-Yord, Foy-Thong, as they believed that it would make them wealthy. Tuay-Fu sweet food, it was believed, would make them flourish. Concerning Med-Ka-Nun sweet food, it was believed that they would be supported in the future.

#### 4.7.1.4 Making merit and virtue at home

The way of life in Tupperng, which relied on tradition, had been successful over a long time, such as "making merit and virtue at home", which was performed every year. Another ceremony of merit making and virtue at home was the "Son-Ka-Barn"

ceremony, which was a sacred ceremony to unlock the power of magic. In the ceremony, people would fix a day with the consent of the village committee who were elected by local people. Most of them were community leaders or qualified persons in the community. The day was fixed in response to the days those people would be free from their duty (rice farming) before starting tobacco farming, which was usually in October. The ceremony would last for 2 days. The first day they would prepare places to give food to the monks. Invitations were provided to the young and people who came to help prepare for the ceremony. They would arrange the place close to Moo 1 Community Public Health Center, as it was a suitable place with the water needed for decorating places, setting up tents, placing mats and chairs, and decorating with colored paper to form various textures, such as a Hanuman figure, cold forest figure, figure of a lady from the literature, etc. In the evening of the first day, they invited monks to come to pray, and after that they celebrated with movies. The funds for the ceremony's expenses came from the donations of the believers. The types of the celebration would depend on the amount of money and how popular they were in the community. In the past, people liked to see Likae, but the popularity faded and changed to music with country songs. There were a lot of beautiful dancing ladies, called "Hang Kreuang".

Food was given to the monks in the morning, by inviting them to breakfast. Food was also prepared for monks and people who came to join the celebration. The more recent tradition was to cook Khanom Jeen Noodles, which people believed were a lucky food and would bring luck. Every family would prepare Khanom Jeen together to give to the monks. They also cooked "One pot of rice, one pot of curry soup" for the monks and people to have together, which was believed a good tradition to establish good relationships and cooperation within the community. In the past, cooking Khanom Jeen was believed to be wisdom from the local people, and continued and accumulated in the past. People would gather and cook Khanom Jeen in a big wooden mortar. The younger ones would come to help each other pound starch and discuss the stages. In addition, after pounding starch they would soften the starch by kneading it, and making it into strips of Khanom Jeen noodle. The process was quite complicated, but enjoyable and collaborative. Nowadays, nobody makes Khanom Jeen like this; they buy it from the market, although they do make the soup (Nam-Yaa) by themselves by boiling fish

with curry to pour over the Khanom Jeen. Sanong Intim said “There is no party to make Khanom Jeen now; everyone likes to buy it instead, but they still make the soup themselves. They do not make it because they have no time, and no tools, such as a wooden mortar, pestle, or Roey, a bowl for kneading starch. Nobody keeps them anymore. It is better to buy it”.

Another holy ceremony was the “Son-Ka-Barn” ceremony. The objective was to release mourning and evil along with the flowing water. Sometimes it was called “transferring the body”, and was done to purge disease.

Every family would prepare a rectangular banana-stem container, called a “Krathong”. Then they would use sticky soil to make doll likenesses of everyone in the family and put them on the Krathong, along with their names. Khanom Jeen was put on the Krathong with flowers (needle flowers), candles, incense, betel palm, cigarettes, coins (2-3 Baht), and drinking water (bottle). They brought all of the Krathongs to the ceremonial area in the evening of the first day.

The village committee would help to make a raft to put all the Krathongs on, which would be made from banana stems (inserted side by side) with a 2 x 2 meter roof similar to the roof of a Thai house, covered with grasses (similar to an ancient house). The raft would be tied to the riverbank. The committee would place all the Krathongs on the raft in the morning, waiting to let them float along the Yom River. After the monks’ breakfast, they would pray “Cha-Yun-Tor”. People would come to sit at the riverbank and pray to release evil, sickness, unhappiness, and mourning, to float and flow along the river. The village committee would light candles and incense, and release the raft to float along the river. Two people from the village committee rowed a boat along with the raft, closely following it to protect it from overturning, and watching until it went out of sight; then they would row the boat back.

Nowadays, the Son-Ka-Barn ceremony has changed from what it previously was, especially the materials used in the ceremony. They used to use rectangular banana-stem containers prepared into dolls. They replaced these materials with various

other types of materials. It was found that nowadays they used new, modern materials, such as paper boxes, foam boxes, plastic baskets and plastic bags in the Tupperng community Son-Ka-Barn ceremony. In addition, the roof of the raft's Thai house, which in the past had been covered with grass, had been replaced with plastic sheeting.

#### **4.7.1.5 Rowing competition traditions**

Another water tradition the Tupperng people were interested in and joined with cheering was the boat-rowing competition among various communities. The competition was usually held during the Thod Kathin festival. Each village prepared boat-rowing competitors to enter the annual competition. They practiced for months and were sponsored by people in the village. For example, the community leader would bring food and beverages to support the competitors throughout the celebration. They also donated clothes for the boat-rowers and screen-printed the sponsors' names on the backs of the competitors' shirts.

On the day of the competition, a tent would be erected for the sportsmen and for the people who cheered along the Yom riverbank. It was decorated with coconut leaves and colored paper cut into various animal figures, and a variety of fabrics were used to wrap the tent poles, with Dao-ruang flowers hanging on the fronts of all tents, since they believed that the Dao-ruang flower represented prosperity and progress. People would come and sit at their own tents to cheer their teams in the competition. They would prepare and cook food at the back of the tent and arrange skilled chefs to cook the food for the boat-rowing people and the people who came to cheer.

Other people with colorful clothes would stand and watch the competition from the riverbank and along the bridge over the Yom River. There were several shops located along the Yom riverbank, most of which were food shops, such as roast meatball, roast chicken, beverages, noodles, etc. Beneath both sides of the bridge were groups of cheering people drinking and singing. The cooks usually shared their food. At the front of each tent were long boats that came for the competition. The bows of the boats would be decorated with colorful cloths, flowers and small flags at the topmost of the bows. Women in front of the tents would use plastic ropes broken into small strips

to make skirts, and cheered and danced in front of the tents. Opposite the tents was the tent belonging to the chairman of the competition. They would honor a senator as their chairman. An articulate speaker was selected to describe and explain the competition.

#### **4.7.1.6 Loy Krathong traditions**

Loy Krathong was another tradition concerned with the river. People would organize the ceremony on the riverbank in front of Tupperng temple, to ask for forgiveness from the river for having made it dirty, and to pay respects to the Buddha's foot as related in the ancient Thai story. The materials used for the Krathong were banana leaves and banana trunks. They would cut large banana stems into small sizes to make the base and stitch the banana leaves to form Krathong leaves and bind them together with thin wire. They released them to float on the river on the 15<sup>th</sup> lunar day of the 12<sup>th</sup> month.

People had recognized Loy Krathong as an important tradition, especially during the previous two years. There was a grand festival, called "burn candles and play with fire", held in Sukhothai Province, and a campaign for the people in the city to encourage them to be proud of originating Loy Krathong. People started returning to paying attention to the prominence of the community, and among those related to the water, some people brought their boats out on the 15<sup>th</sup> lunar day of the 12<sup>th</sup> month to float their Krathong. Most of them maintained that it was to ask forgiveness from Mother River. They made announcements at the temple, asking people to float their Krathongs together, by praying through a speaker in the temple to let everyone hear. A lot of people came together to float their Krathongs on the river.

During the night of Loy Krathong, they would organize movies and play games; some of the games they played were handed down from the past to the present. Several activities were being rediscovered, for example sea boxing, and historical dance.



#### 4.7.2 Sources of waste from the way of life (traditional perspective)

During the abovementioned ceremonies, people liked to arrange impressive celebrations to display the reputations of the hosts and their relatives. Despite having no money, they would borrow money from others merely to preserve their social status. To over-invest in giving merit and virtue would not provide a good result at all. Garbage resulted from what the people who were not afraid of the cost prepared and cooked. They bought expensive items, such as whisky, cigarettes, and various brands of sweets for luxurious, impressive wedding celebrations, or too much food for the people in the “becoming a monk” celebration. All of this behavior created post-celebration waste. Some celebration waste was more than enough to fill a ten-wheeled truck.

Nowadays, during Khao Phansa, most people abide by tradition and bring Phansa candles to the temple. The temple receives many candles and only utilizes the baskets, not the candles: *“I also bought a candle and gave it to the temple. I saw many people bringing candles to the temple, and a lot were piled up in the corners of the temple hall. They did not know when they would use them and for what purpose, and left them behind Some were broken”* (Sum-ang Puntrut, Conversation Group, B.E. 2546). The remainders were also a source of waste.

On religious days, food was given to the monks at the temple. Many people came to join in, and each brought rice in a bowl and food in various containers to give to the monks, such as Pinto, aluminum pots, enamel pots, and plastic boxes; the majority was plastic bags. After the monks gave their blessings, everyone rushed back home; they would not stay for lunch as they used to do. A lot of food was left over. They gave excuses such as *“Hurrying back to the farm...”* or *“There’s nobody at home”*. Only a few people and a number of nuns would lunch together. It was too much food for the monks to eat alone. Although part of it was for the monks’ assistants, a lot still remained, which spoiled and was ultimately dumped into the river. Like the 3-month Khao Phansa period, the monks received a lot of food from the people, but less than Khao Phansa Day. People would go back home after the monks gave their blessings. These similar activities created a lot of leftover food, and even though part of it went to feeding dogs, a lot remained and was left to spoil. People with good

intentions threw the rotten food into the river to keep the temple clean. They did not know that they were polluting the water in the river. In addition, the food, which was packaged with materials that were non-biodegradable, was finally disposed of by throwing it into the river.

On some special religious days people would bring rice, foodstuffs and fruit to put into the monks' bowls in the morning. They stood in line on the opposite side of the temple hall. They also put coins into the rice. The spiritual guide would walk with a "3-foot tray" tray in his hands leading the monks in a parade holding the bowls in their hands. All would pass among the people. People would put flowers into the spiritual guide's tray and put rice into the bowls of the monks until the last of the monks had passed by. During these activities, monk assistants (normally children) would bring plastic baskets to transfer the rice to the bowls of the monks. People felt cheerful and happy and did not push or pull to get a space to stand or sit. A lot was left behind after everyone returned home. The leftover food and flowers that were spread over the temple hall were swept onto the riverbank behind the temple.

The Tupperng community traditions that date back many years, the "Make merit and virtue at home" tradition, and another ceremony arranged on the same day "Song Ka-Barn", produced a lot of garbage, from the decorations, the raft decorations, and from the Krathongs--there were paper scraps, plastics scraps, banana leaves, and flowers. In addition, a lot of waste material was dumped into the river while making the raft for the "Son-Ka-Barn" ceremony. These materials (either rotten or not) contaminated the water, like Loy Krathong.

The boat-rowing competition, making merit and virtue at home, enjoying movies and entertainments in the community, all created garbage and waste, since a lot of people came to join in together. It was observed that, after a boat-rowing competition or a night of entertainment at the temple, or after making merit and virtue at the home celebration, a lot of garbage was spread all over the place. It was also found that it had been swept and left at the riverbank, where there were a lot of grasses. Especially during the row-boat competition, a lot of people joined in at both sides of the riverbank, which resulted in a lot of garbage being left in the river.

The traditional celebrations and ceremonies of this community highlight the value and conceptual changes of the people in the community. A positive concentration on those activities was the main objective for relations among the people, and religious ceremonies. These ceremonies were primary factors effecting links between the people and the temple (or the Buddhist religion). People had to bring food for merit and virtue, in the belief from the past that it would successively link people in the community and the Buddhist religion, so that they ate together. But there was always leftover food that was thrown away. In addition, it was the time for people in the community to discuss and learn from each other; but when the people finished giving food to the monks, they believed that the activity had ended and each would go back to their own home. The leftover food would go to the monks, monk assistants, pets, and ultimately became their burden. They were not able to eat all of it, since there was so much. In addition, foodstuffs were packaged with materials that were non-biodegradable in water. The river was the dumping ground for garbage that had to be eliminated at some later time.

## **4.8 Ways of Living Together in the Community and Solving Community Problems**

### **4.8.1 Ways of living together in the community**

Tupperng community was an agricultural community, where most of the people grew tobacco and farmed rice. The houses were located together in groups of relatives along the Yom riverbank. All of the villages in the district used the same name, “Tupperng”, but the names of different communities were unofficial; for example, Ban-Tupperng Moo 1, Ban-Tupperng Moo 2, etc. The location of the houses was one factor that caused them to stay together, from times long past until today. They liked to locate their houses in the same region, close to and next to each other, without fences. These characteristics were traditional Thai-style beliefs. All of the relatives built their houses in the same area, to build relationships among the people in Tupperng community. By its nature, this would reflect and enhance a strong community, with understanding and cooperation in solving problems. People in the same area would become involved when there was a religious celebration or ceremony. The physical location, by its nature, helped support unity.

The Yom River was like the main artery of the community. In the past, they took this area to set up a community and used the river as their transport to visit each other. Nowadays, the transportation route has changed from the river, to roads cut through the village. This is very different from rowing boats, as they had previously done, when they could say “Hello” to each other as they rowed their boats past the houses of the people they knew. However, when the transportation routes changed, they retained the greeting, and as transportation became more convenient, they were able to join community activities more easily.

The fundamental nature of the Tupperng community was a mutual-help society. It was primarily a society of closeness and familiarity. The relations they had were personal rather than official. People were generous to each other, and they would share things such as food with their neighbors. Their open social minds created a feeling of closeness and caring for one another. They were easy to unite and combine into a group. Whatever happened in the village, people of all ages worked together, for instance, when it flooded, as it did every year, together they placed sandbags blocking the water along the Yom River. The stronger people would carry the sandbags and the women would tie them together. They united and worked to block the water that was going to overflow the riverbank. They worked together with compassion, as every house would get the same benefit, and it created cooperation to solve problems.

Tupperng people had a tradition of helping to solve problems together, and this derived from the traditions they used to have in farming tobacco. When farming tobacco, they would have to depend on each other, as it was a hard job, impossible to do alone; for example, initially preparing the area and plowing the soil before growing tobacco. It was common to ask for help from people who were staying around that area, be they relatives, friends, or neighbors. They also borrowed tools from each other; for example, long ladders for drying tobacco, spray equipment for insecticide, containers for tobacco seed, etc. This brought them closer together and made their relationships stronger. This fundamental way of life made it easier for them to cooperate. Another factor was their belief in Buddhism, and there were many celebrations, ceremonies, and festivals, nearly every month. People liked to lend a hand, as they liked to make merit,

and it also made their relationships stronger. The fair in the village helped them combine into groups and participate, exchange ideas, and converse. It also created a feeling of residing and working together. Somchai said, *“To go and help in the various merit fair, it is a matter of pride; if we don't go, they won't come to our fair. So we have to go to their fairs”* (Somchai Yimpin, Conversation Group, B.E. 2456)

Families in the Tupperng community were mostly extended families comprised of relatives. The newlyweds would stay close to their parents' house and among their relatives. This made them feel close to each other and created constant interaction among the relatives. Sukrepe said, *“When anybody gets sick in the night, we are able to ask about them continuously. People here do not like to build their houses alone”*. People in the Tupperng community had long-term relationships with their relatives. All the people knew each other, they knew the family names in each region, and the same family groups built their houses in the same area. Subin Meeparn said *“When we were newlyweds, we stayed in the same house as our parents, and after we amassed some money, we built a separate house in the same area as my mother's house so that we were able to take care of our parents”*. People in Tupperng believed that, after marriage, the man should stay at the woman's house, and very few women would come to stay at the man's house.

Cooperation to solve the problems of the community was very strong in the past, as they had the same occupations, tobacco and rice farming. When the price of tobacco declined, they usually combined to bargain with the tobacco buyers, or to bargain for fertilizer and insecticide. This made them sympathize and understand the same problem. In addition, they combined as a group to solve the flooding problem by helping to make sand bags to block the water, and to solve epidemic diseases such as dengue hemorrhagic fever. From observation, people relied on each other during periods of sickness, when relatives would come to visit and provide suggestions about good medicines or better treatments.

People who were farmers usually joined the community regularly, but most of them were middle aged or older, since they were farmers and of similar age. They were very close to each other because they had to rely on each other, as well. The new people would not rely on the community as their parents did, since they were more concerned with studying. Their studies made them leave the community, because they would get a job outside it. Therefore, they seldom joined any community activities.

In solving community problems, the community leader was also a factor linking the cooperation of the people in the community. Somnuk Yimpin, head of the village, was the person people paid respect to for a long time, as he was very generous and liked to help others and the government sector. People in trouble could get help from him. Similar was Srisamuth Suakrin, village head of Moo 8, who was a new village leader, and full of enthusiasm to work, he was supported to head village Moo 8 by Somnuk Yimpin, head of the village. People trusted in him. When any job needed cooperation from the people, he would publicize it in the news distribution hall. A lot of people would come to join in, because people believed him and believed in his leadership ability. He was a local person who understood what the people needed. He also had a personal relationship with the people. He took his work very seriously and did not earn money for himself while working for others. That helped him to get votes every session.

Another example showing cooperation in the community was the buildup of a Basic Community Public Health Center by consultation and gaining consent from the village committee. Upon getting consent, the news was announced to the people in the community and a Pha-Pa fair was set up in the community. The total amount of money received from the fair was 25,000 Baht, and some also donated wooden logs. The people in the community came and helped to build this office. After the building was completed, the center became a public benefit for the community. It was the place for all community activities, as well as a working office for the community committee. It is still used today. It indicates the strong relationships among the people living in the community.

Participation in the community was a way of life that the people were still holding onto; for example, asking for help with rice farming. This was because most of them farmed tobacco. So, traditions would be concerned with several occupations, such as asking people to come help plow the farm. “Karn aou Rang” was an activity asking for a help to plow the ground and grow tobacco. Help in this area would be separated into Normal and “Kag Yok”, where the latter would have more activity than the first. The first one required help from about 5 to 10 close friends. The latter required a lot of people; sometimes 30 to 50 were needed to complete the job within a day. Most of the people who came were laborers. The host or farm owners would cook and arrange food for the helpers, and prepared the food in keeping with the number of people who would come to help. The second permitted young people within the village or from another village to meet each other.

Participation among the people in the community was apparent in the traditions that are still active today, such as the tradition of becoming a monk, and traditions about death. Both activities indicate that this community participates fully. People of all ages joined the community. They relied on each other either because they were friends who used to help each other or were relatives. Nowadays the population is increasing as people separate their houses for the second generation. This has forced the community to grow ever larger, but their relations still remain very tight. This was because people in the community still relied on the community and the houses to do and join in activities together regularly. A new member of the community, who wanted to participate in the community activities but was still living in their original location, acted like a linkage joining the relationships between communities. This was reflected in smoothing out the operations of the activity.

The basic participation of the Tupperng community derived from their past habits and traditions. They might be described as kind people who rely on each other, with pleasure and good merit. As Pratum Inkong, one of the elders, said “*the habits of the people here are country style, and they are very good and help each other*”. She also maintained that they helped all day and all night. Before merit day, they swept the temple hall, washed the toilet rooms, and would help others after they had completed

their current task. All of them relied on each other and helped each other, and therefore were very reliable.

After they had cropped the tobacco and sent it to the factory, it was time for rest after working hard for a long time, and the people, either male or female, would form a group and hold a meeting. They would make things to use in the houses such as weaving baskets, sewing clothes, etc., since growing rice was not the main occupation of the community. They would assemble at Yong's shop and at the village head, Sri Samuth's house (front). The group was over middle age and most of them were female. The issues they discussed were television shows, lottery numbers, life or their children's behavior, those who went to work in the big city, sending their children to study, etc. Conflicts in the community were not clearly identified; in general, they usually greeted each other and said bad things behind other people's backs.

#### **4.8.2 Ways of life to solve problems, Buddhist style**

Sukhothai people have relied on Buddhism since Sukhothai was the capital of Thailand. The past influences of Buddhism, which flourished and spread out to affect and determine the ways of life of the community, had made them rely on Buddhism for a long time. The ceremonies held were ones concerning Buddhism. The fundamental values of the people derived from their style of Buddhism, combined with the life and living in the area, which were evident in the forms of beliefs and traditions. These had been transferred from 3 institutions--ancient institutions, temple institutions, and family institutions.

The concept was to solve life's problems using Buddhism and fundamental traditions. Buddhism helped the people of Tupperng to feel secure and live with strong minds, using reason to dissipate trouble and the causes of trouble, and using wisdom to solve problems, being prepared to help the people faced with troubles or in trouble. In the meantime, the fundamental traditions of the community were concealed by the lifestyles of the people. They relied on each other, which was demonstrated in members' participating in solving problems in the community. Examples noted were participation in solving the flooding problem, uniting into a group to bargain and



change the tobacco price, maintaining public property, solving the agricultural water management system, solve the problem of mosquito-borne diseases in the community, and fixing the inoperable tap-water system. These may be summarized as a communal problem solving system.

Existing groups usually solved problems, or existing organizations in the community used working groups that were formed to solve the problem. The representatives would be responsible for solving problems. People in Tupperng commented that it would be more efficient to solve problems in a group compared with solving them on their own. This was because the group could provide more and better solutions. The group also acquired people who had experience in solving the problems and had more time to check for mistakes. Berm said "If a problem happened, why should we think alone, let's think together, and as they said, one guy loses his head, many people--good friends" (Berm, Focus Group, B.E. 2547). Discussion would encourage and create a feeling of warmth and lead to ways to solve the problem. This was better than working alone to reach the same goal.

People in Tupperng were taught the way to solve problems by the Buddhist approach every time they listened to prayers. The holy men and monks had studied and discovered teachings to use in prayer, and merit and virtue days. In various ceremonies, such as at a wedding, they would tell the couple how they should treat each other, how to use the four noble truths to solve life's challenges. It took about 20-30 minutes. In a house-warming ceremony they would teach how to create warmth in the family, principles to eliminate troubles, and how to solve problems in the family using the four noble truths. In the meantime, when teaching in a funeral ceremony, the monk would pray and put forth the four noble truths. In addition, in a holy conversation on a special Buddhist day, they usually taught how to solve a problem using a Buddhist approach, and to solve problems related to ways of life. Providing and stating the principles of the Buddhist approach helped the people in the community to be patient and spend their lives successfully in the era of globalization, which would encompass community development, the status of problems, and ways to participate to actually solve the problem. This would provide an approach or standpoint to solve problems using a

Buddhist approach, which had been ingrained into the lifestyles of the people in the community.

Monk Direk said “Buddhism concentrates on human development, physical behavior, speech, mind and wisdom, with the third Sigka concentrating on understanding real life and living together appropriately and happily with other humans and all other live animals. Buddhism concentrates on either content or practice, as it will appear as a result. In addition, the Buddhist approach to problem solving concentrates on the source of the problem and ways to eliminate the trouble, *“about these issues, I always teach in prayer”* (Tupperng Temple Religious Conversation Group, B.E. 2546). Monk Direk tried to teach the noble principles to the young, and he also had teaching hours to teach the noble principles to students in Tupperng School. In addition, he opened a class nearby his hall to teach monks, students, and other people. It was observed while participating in the teachings of the four noble truths during merit day, at the multipurpose hall moo 1, Ban Tupperng, that they said the four noble truths were “excellent truths that the Buddha found to be an ordinary issue and able to be found by any person, through analysis. We have to discover the cause creating the problem and try to select alternatives to solve the cause; this is the principle for analyzing and solving a universal problem. Only the Buddha reached the next stage, seeing that if the trouble stays with us that trouble us either physical or mental, and the way to expel this trouble is the middle way. If people are not greedy, angry or proud, they can use the four noble truths to analyze problems and society independently

#### **4.9 Conclusion to the Ways of Life of the Tupperng People Concerning Waste**

**Way of life and occupation:** the Tupperng people were agriculturists and concentrated on productivity per Rai. They regularly used chemicals to kill insects. These farmers usually threw used insecticide containers, such as cans or bags, into the Yom River. This waste or garbage was considered dangerous. In addition, they also cleaned the aforementioned containers in the Yom River. This was reflected in the water condition of the Yom River. Furthermore, on both sides of the Yom River they

grew tobacco and vegetables, which created wastewater. The wastes from cooking, composed of nitrogen and phosphorus, drained into the Yom River when it rained or after washing. At the same time, wastewater from farms contaminated with chemicals and other insecticides, such as herbicides, were directly dumped into the river

The utilization of new technology on the farms generated garbage and waste that was very difficult to eliminate, for example, lube oil bottles, grease bottles, old transmission belts, etc. Furthermore, toxic materials from farming activities, for example, electric tubes, batteries, brake fluid, cleaning agent containers, etc., were found. People did not separate these wastes or use the right methods for disposing of them. In addition, the farming trucks, after being used in the evening, were always cleansed of dirt and mud and oil at the riverbank. The water mixed with the mud and oil and drained directly into the Yom River. The used oil from the farming trucks near several houses formed pools of oil and the rain washed all of this oil into the Yom River and contaminated the water source.

**Consumption lifestyle:** the changes in the economy, society, culture and lifestyles of the people in the community led to a new, complex society, reflecting how the consumption habits of the people changed from relying on the ecology of the community to relying on the market system. Relying on food from the market system created excessive packaging material residues from the consumed products. Everything they bought from the market or the shops in the community was wrapped with packaging material. These packaging materials were numerous and not reusable. *“There are a lot of plastic bags, and we get them every day; tomorrow they’ll come again. We kept a lot of them, but the dirty ones were thrown away...”* (ThongKum, Conversation Group, B.E. 2546). These materials were left and neglected, and became a waste problem. The wastes, such as plastic bags, vegetables, and fruits were disposed of in the Yom River where the people thought it was convenient to get rid of them. It was also close to their houses, and they did not have to pay any service charges to throw garbage into the river.

**Way of life from a traditional perspective:** for becoming a monk, for weddings, merit and virtue fairs, people always prepared food to give to the monks and to entertain the people who came to join the ceremony. It was a nice tradition to build relations between the people who lived together in the community. But after the fair, the solid wastes that were left were dumped into the river. Contaminants from the toilets also drained into the river. This increased the different types of pollutants in the river.

The rowboat competition, the earning of merit and virtue at home, and entertainment for the community brought garbage and sewage, since a lot of people joined in. Inspection after a competition, a night of entertainment in the temple, or merit, found piles of garbage spread all over the area, some of which was swept away and left on the riverbank where there was a lot of grass.

On monk's day, a lot of people gave food to the monks in their monks' bowls. After the monks had eaten and given blessings to the people, the people would usually hurry back home. This situation made for a lot of leftover food, even bringing some to feed the dogs around the temple; still, a lot of leftover food remained and was left to spoil. Some people with good intentions would throw this spoiled food into the river without knowing that it would contaminate the river. In addition, they gave foodstuffs in containers manufactured from the materials that were difficult to destroy, and all of them were finally disposed of in the river.

**Environmental hygiene:** it was found that drain water is wastewater. The water from cleaning dishes, washing clothes, bathing, using the toilet, cooking (such as cleaning fruit, fish, and beef), farming materials, such as insecticide tanks, cleaning of the farm truck, and wastewater from other activities, such as motorbike cleaning, kitchen cleaning, and water from the toilet, all drained directly into the Yom River. In addition, the garbage from households, shops and schools was left on the riverbank, and was found in many places.

There were piles of garbage on both sides of the river (Tupperng District) *“The garbage? It’s a problem... one at the foot of the bridge at the temple entrance, another at the front of the temple and one at the temple hall...”* (Somnuk) or *“... one over there beyond Berm’s house, you see, throw it here, some still at the riverbank, all in the water...”* (Samarn) and *“... from the school, they throw it behind the school, that is, once in a long time it will be burnt, and the janitor always pushes it into the river....”* (Subin).

Tupperng people liked to build toilets and bathing rooms as a single unit. After using the toilet, the sewage flowed onto the ground beneath the house and formed pits of water. People called these pits “Num Krum” because its color is black with a bad smell. Chickens always come to scrape these pits. Nobody managed these Num Krum; they let them dry. Some dig long channels and let it flow to the river. Num Krum was a source of mosquitoes, which was also a community problem.

## **Phase II Waste Solution Model of the Community Near Yom River**

### **4.10 Waste solution model**

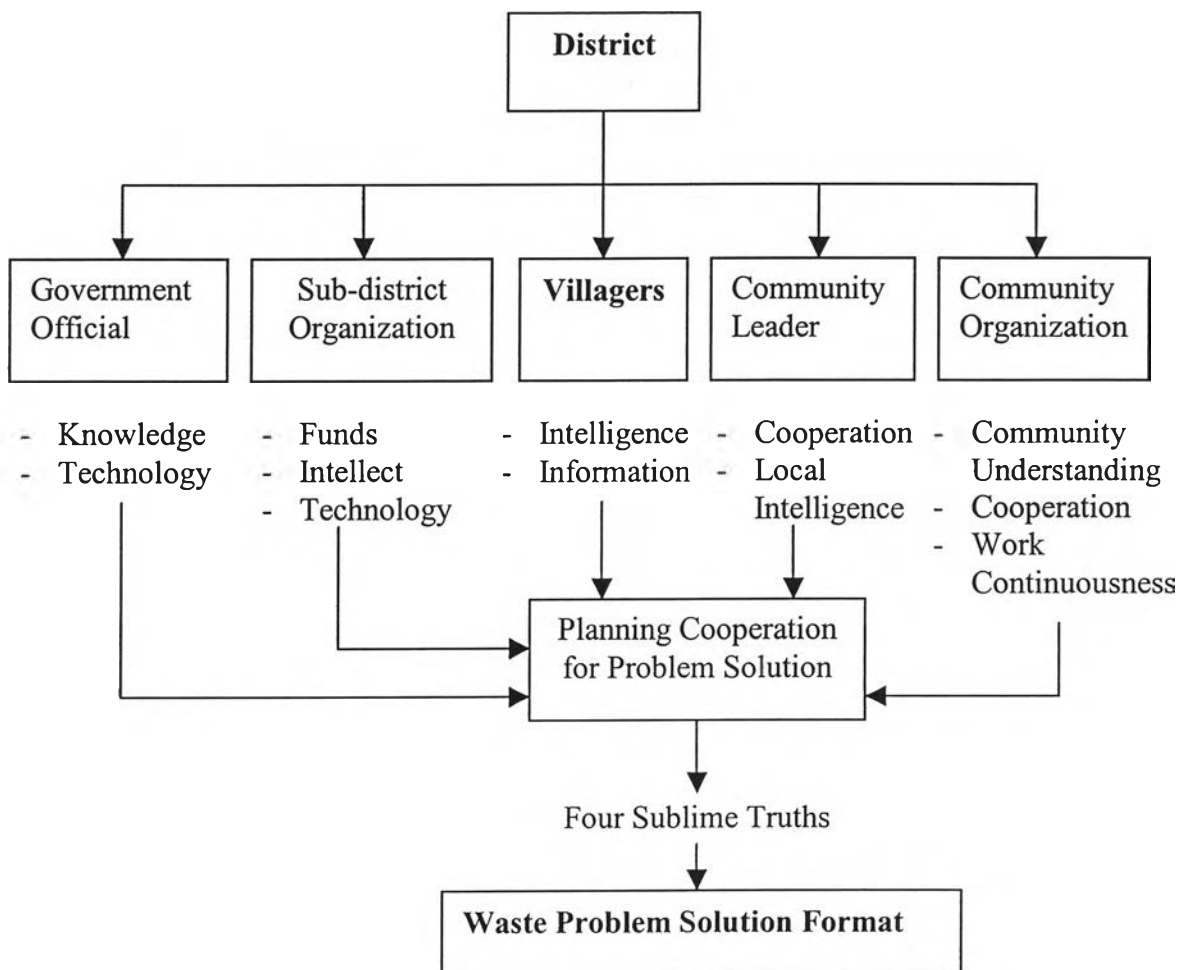
Studying the lifestyle involving the waste in the first section, the local research team realized that the waste in Tupperng Community derived not only one person someone but from all parts’ direct and indirect activities in community. Thus, all parts, that was, villagers, local organization, community leader, local government officials and religious leaders, had to be responsible for this circumstance because these parts were relevant to the problem. Paying importance and consideration to the waste problem in Tupperng Community was necessary as the guideline for cooperation by using the strong points of all parts to create the creative power or solution as known as “multilateral”, which was the answer for the waste problem.

All relevant parts consisting of local government officials, organizations in community, representatives of villagers, community leaders, and monks were the most important factor leading to the success of waste management in the community with its

own format. Consequently, after all parts realized the reality and the cause of the waste, had information and understood the problem. They need to hold a meeting in order to brainstorm and find a way to manage the waste problem of Tupperng Community.

So, the cooperation to find a waste solution format led to various styles and methods to manage the waste problem of Tupperng Community. In addition, there was an acceptance of innovation and environmental management technology, which was consistent with the community's requirements. The planning, operation originated from all parts was regarded as the model of waste management in the local community level and solved the waste problem concretely.

Holding a discussion stage to find the waste solution for Tupperng Community can be written in diagram as follows:



**Figure 4.3 :** Diagram of Cooperation for waste solution in the Tupperng Community

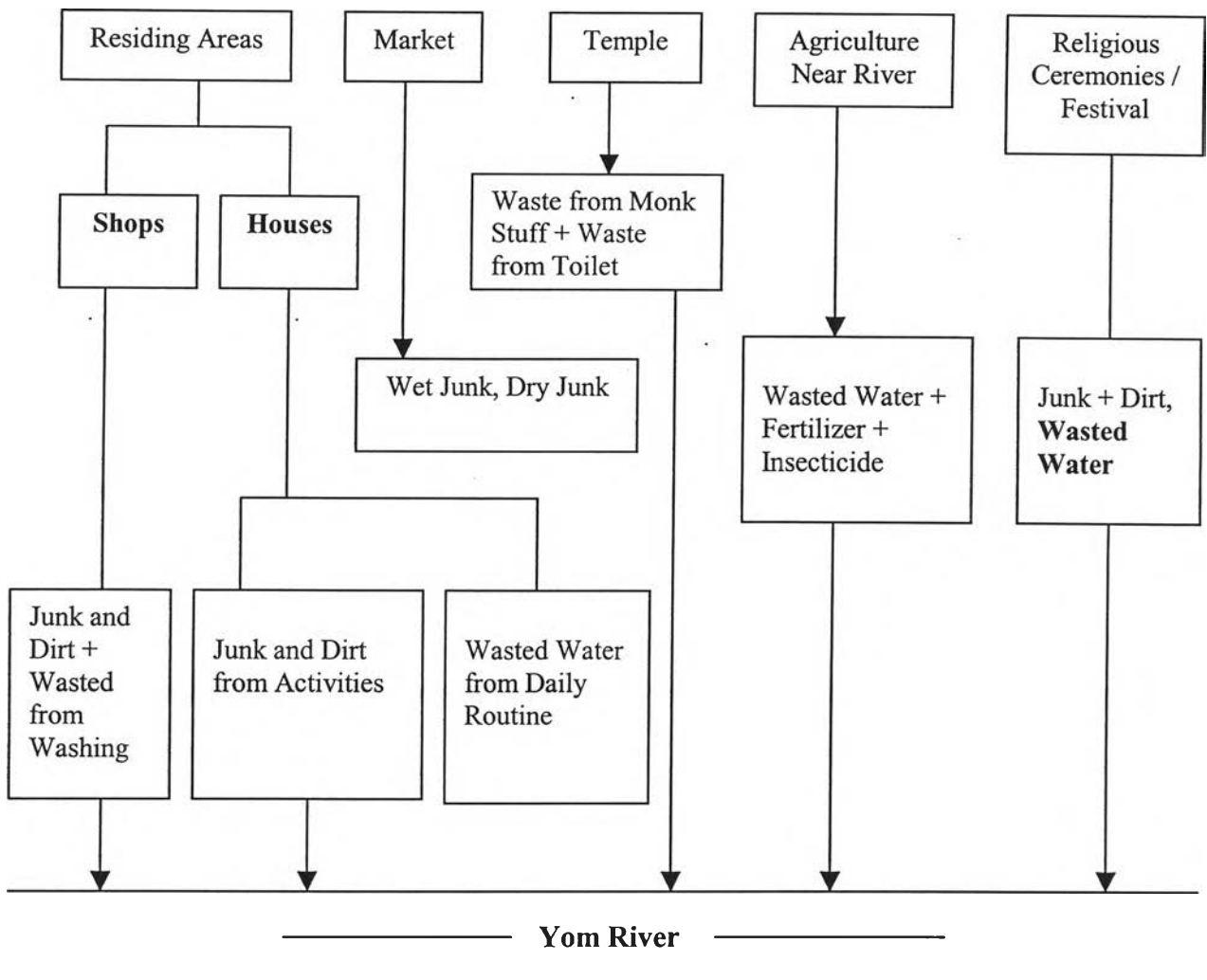
Before the group process for finding a waste problem solution, all relevant parts joined in a relationship process by playing the River Life Game, Matching Game and Telling Impressive Experience Game. The participants of this research played games together in a fun and friendly atmosphere, so the group members felt secure and safe. As a result, all parts gained trust in one another. In addition, the research emphasized on the goals of participation, rules and performance guidelines as the group member. According to the observation, the participants were relaxed and eager to brainstorm together because they used to join in the relationship game between members previously. The researcher also encouraged the participants to express their feelings and opinions for building power in solving the community's problem. The participants, on the other hand, had to fight problems or obstacles as well. Such acknowledgement creates trust among the participants.

When there was trust, all participants were willing to reveal and express their opinions, feelings and experiences. They were also confident to give and accept opinions of other members. Moreover, they were less nervous.

#### **4.10.1 Working Phase**

Due to early relationship building, all members trusted and relied on each other. In addition, as the researcher was familiar and close to the group, the participants expressed their thoughts, exchanged experiences and revealed themselves. It was found that all members were interested in the problem in terms of waste management, finding and selecting a problem solution.

Having learned the lifestyle of the community in light of development, consumption, occupation involving with the waste, the waste from traditional activities and daily routines the researcher and participants gained the perception and understanding of the waste process in Tupperng Community. As a result, the group found a guideline to solve the problem properly according to the local district. The members summarized the waste origin in the diagram as below:



**Sources of Dirtiness Thrown to Yom River**

**Figure 4.4 :** The summarize of waste origin

From the interpersonal interaction, the researcher raised the issues to be discussed in the meeting as follows:

- Problem (Tukka- Suffering): Was there any problem of the community originated from throwing junk in the river? How?
- Cause of problem (Samutai - Cause of Suffering): What was the cause of the problem? Why? With whom?
- Guideline for solution (Nirod - Extinction of suffering): What should we do to reduce or eliminate the problem?
- Solution performance (Makka - Four paths leading to Nirvana): How to solve a problem?



The resulting brainstorm of using group process to find a solution format of Tupperng Community can be presented as follows:

**Table 4.7 :** Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
<b>Tukka</b> <b>(Suffering)</b>	<p data-bbox="531 643 917 676"><b><u>Problems in the community:</u></b></p> <ul style="list-style-type: none"> <li data-bbox="575 698 1323 787">- In Yom River was so wasted that it couldn't be consumed</li> <li data-bbox="575 809 1323 898">- There was a lot of junk in the community, near the banks of the river</li> <li data-bbox="575 920 1323 1008">- The waste smelled bad both near the banks of the river and in the river</li> <li data-bbox="575 1030 1323 1119">- The waste water from houses, which were incorrectly disposed of, was the germ source</li> </ul>
<b>Samutai</b> <b>(Cause of Suffering)</b>	<p data-bbox="531 1152 783 1185"><b>Causes of Problem</b></p> <p data-bbox="531 1207 1323 2017"><b>1. Occupation Lifestyle:</b> The villagers in Tupperng Community were agriculturists emphasizing on increase of products. They also used chemicals to get rid of weed and threw the empty insecticide containers such as tins or bags in the Yom River. The rubbish was dangerous. Additionally, the villagers washed the containers and spraying materials in the river. Some villagers even wash the clothes dirtied by insecticide in the river. Furthermore, there was wasted water from agriculture on the both banks of Yom River, which were used to grow vegetables and tobacco. Thus, the Yom River was wasted by agriculture consisting of nutrient contamination, for instance, nitrogen and phosphorus, which flowed to Yom River when raining or washing. At the same time, the wasted water from agriculture was also contaminated by other chemicals of weeding destruction.</p>

**Table 4.7 :** (Cont.) Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
	<p>Using modern technology in agriculture, there were a lot of rubbish and waste, which were very difficult to eliminate such as lubricant bottles, lubricant tin, old belt etc. Additionally, there was poisonous rubbish from agricultural activities such as insecticide tins, batteries, brake oil, weeding containers etc. The villagers did not sort out and eliminate the rubbish properly. Moreover, in terms of tractors, after finishing daily field plowing in the evening, the agriculturists usually washed their tractors, which were dirtied with mud and lubricant, on the bank of the river, so the water in Yom River was contaminated by mud and lubricant. Due to the lubricant transfer in many tractors, the lubricant was overflow. When it rains, the oil stain washed into Yom River leading to the contamination in water sources.</p>
	<p><b>2. Consuming Lifestyle:</b> The changes in terms of economics, society, culture and lifestyle to the modern society, which was complex, effects the community's consumption style, that was, from the based-ecological system to the marketing system. As food was depended on the marketing system, there were many materials and packaging left, such as plastic bags, vegetables and fruits, leading to the rubbish problem. However, the Yom River became the place of rubbish because the villagers thought that the river was the place to eliminate waste conveniently without any charge.</p>

**Table 4.7 :** (Cont.) Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
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**3. Traditional and Cultural Lifestyle:** In the ordainment, marriage and merit ceremonies, there was always the food preparation for monks and guests, which was culturally regarded as a good tradition in building the relationship and participation of the community. However, after these ceremonies, the amount of leftover food was usually thrown in the river. Apart from this, there was also the waste from the toilets contaminating the river, which effected much of the water quality.

After the long boat competition, merit ceremonies, and entertainment in the community, there was still rubbish and waste widely dispersed and the villagers usually swept the rubbish to the banks of the river.

Every Buddhist Holy Day, the villagers will brought a lot of food to the monks. Normally, after the monks finish having lunch and giving a blessing, the villagers went home promptly. So there was a lot of food left although some of the food were fed to the dogs. Some villagers threw the wasted food in the river because they wanted to make the temple clean. However, they did not realize that they were harming the river. In addition, there were some dry foods given to the monks packaged with materials which did not decompose. As a result, the dry food was also a source of rubbish, which was thrown to the river.

**Table 4.7 :** (Cont.) Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
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**4. Environmental Health:** There was wasted water from dish washing; cloth washing; taking a bath; using the toilet; food preparation such as washing fruit, vegetable, fish meat; agricultural equipment washing such as insecticide containers, tractors; and also the wasted water from other activities such as washing motorcycles or kitchen. The wasted water from toilet was flowed directly into Yom River. Apart from this, there was still rubbish from houses, shops, temples and schools, which were placed on the rubbish piles, on the banks of the Yom River near Tupperng Community.

The villagers in Tupperng preferred to build the bathroom and toilet together. When there was an activity in a bathroom, the wasted water flowed to the house's basement, this was called "slush". The slush usually smelled bad and the chickens rummaged in it. However, the villagers did not manage the slush and let it dry gradually. On the other hand, some villagers dug a long way for the slush to drain to the river. This was a significant source of mosquitoes, which was another major problem of the community.

**Table 4.7 :** (Cont.) Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
Nirod	<p data-bbox="525 426 832 455"><b><u>Guideline for Solution</u></b></p> <ul data-bbox="572 482 1317 736" style="list-style-type: none"> <li data-bbox="572 482 1317 570">- The problem could be solved if all parts of Tupperng Community cooperated together</li> <li data-bbox="572 592 1267 621">- Solving the problem at the causes of the problems</li> <li data-bbox="572 643 1317 736">- There should be both short and long guideline bases on the community's appropriateness and capability</li> </ul> <p data-bbox="525 763 836 791"><b>Guideline for Solution:</b></p> <p data-bbox="525 818 709 847"><i>Wasted Water:</i></p> <ol data-bbox="572 873 1317 1574" style="list-style-type: none"> <li data-bbox="572 873 988 902">1. Building the absorbing holes</li> <li data-bbox="572 924 1188 953">2. Building the toilets on the banks of the river</li> <li data-bbox="572 975 1222 1004">3. Growing plants for absorbing the wasted water</li> <li data-bbox="572 1026 1258 1055">4. Building the simple well for wasted water storage</li> <li data-bbox="572 1077 1020 1106">5. Providing the tank for the toilet</li> <li data-bbox="572 1128 1317 1221">6. Building the earthen dykes to prevent the wasted water from flowing in the river</li> <li data-bbox="572 1243 1317 1336">7. Building the wasted water gutters to the non-used ponds</li> <li data-bbox="572 1358 1317 1451">8. Building the wasted water paths from houses to fruit gardens</li> <li data-bbox="572 1473 1317 1566">9. Building the concrete path under the toilet in order to use the wasted water to water the trees</li> </ol>

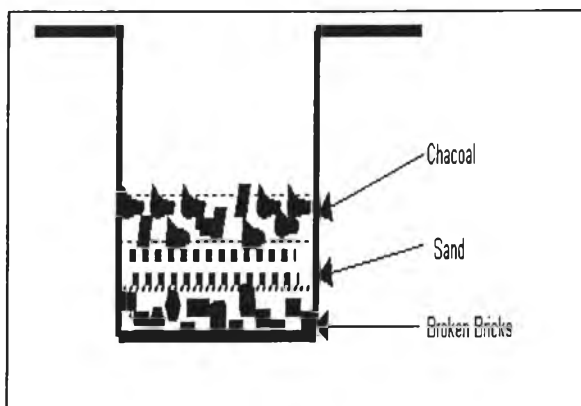
**Table 4.7 :** (Cont.) Solution model By Using the Principle of Four Noble Truths

Four noble Truths	Results of finding the answer by local researcher
	<i>Rubbish and Dirt Elimination:</i>
	1. Building the holes for getting rid of the rubbish
	2. Sorting out the rubbish
	3. Using the remnants to feed the animals
	4. Providing a dustbin for all households
	5. The Sub-district Administrative Organization should provide the garbage collecting service
	6. Establishing the rubbish center or the garbage bank
	7. Recycling the garbage
	8. Reusing the garbage
	9. Setting up a sign not to throw any garbage on the banks of the river
	10. Producing biological fertilizer
	11. Producing fuel from dry garbage
	12. Canceling the agriculture on the banks of the river
	13. Burying the garbage in the farms or gardens
	14. Condemning the name of people throwing garbage in the river
	15. Canceling the help for people throwing garbage in the river
	16. Providing the patrolling shift to look out for throwing garbage in the river
	17. Providing space for washing tractors
	18. Using other materials instead
	19. Building the consciousness of community and river preservation
	20. Establishing the community rule not to throw garbage in the river
	21. Providing public relations through the loudspeaker Building the good example

### Makka (Paths leading to Nirvana)

**Table 4.8 :** Solution model (Makka)

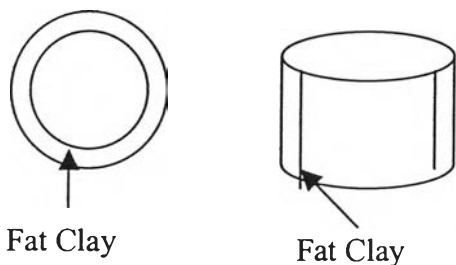
Plans of Wasted Water Solution	Solution
<p>1. Building an absorbing hole for wasted water from households. The households should choose a proper space for digging the absorbing hole, that is, the hole should be near the wasted water area. Then, dig the hole of 1 meter depth and 1 meter width; place broken bricks at the bottom of the hole; put rough sand and charcoal on the top as seen in the following picture:</p>	<p>Wasted water from kitchen, bathroom, toilet, cloth washing</p>



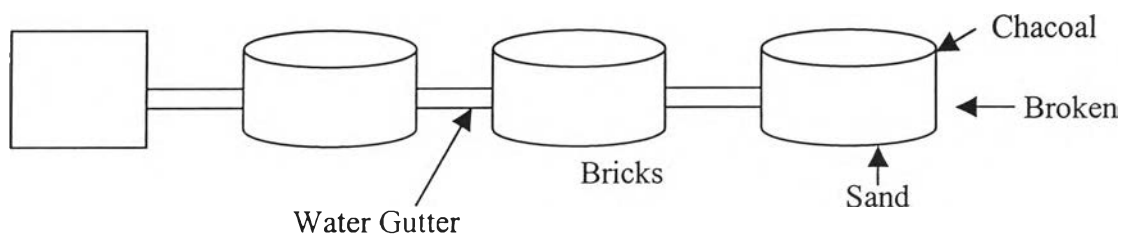
2. Toilets on the banks of the river: The households located near the banks of Yom River must build a special toilet, that is, the toilet with double frames by putting fat clay between both frames in order to prevent the absorption of wasted water from toilet. In addition, the villagers should build the cistern for each toilet
- Wasted water from toilet

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
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3. Building simple wasted water well: The households put the medium frames in the hole, which is digged as deep as the frames. Build the path from wasted water of household to the frames, which is put by the broken bricks at the buttom, sand and charcoal. This is look like the absorbing hole but there are more wells connected each another as seen from the picture. This method is proper to the house with a lot of wasted water. It is also suitable for temples and some houses holding merit activities.





**Table 4.8 :** (Cont.) Solution model (Makka)

<b>Plans of Wasted Water Solution</b>	<b>Solution</b>
<p>4. Growing plants for absorbing waste water: This plan is to grow plants in the Yom River when there is no flow in winter and summer in order to absorb wasted water and make the water clearer. The plants, which are suggested to grow, are water morning glory, sacred lotus, water mimosa etc. because these are edible vegetables.</p>	Wasted water treatment in Yom River
<p>5. Cancellation of growing plants on the banks of the river and prohibition of using insecticide or weeder near the river. By this, the households are requested to cancel the plantation on the banks of river, that is, they should grow plants in their farms in order to prevent the contamination of fertilizer, insecticide and weeder in the river.</p>	Wasted Water treatment from agriculture on the banks of the river
<p>6. In terms of tractors' lubricant transfer, the villagers should use the containers to place under while transferring in order to keep the lubricant for other usage such as to smear on the house's post in order to prevent from the ants and termites. In addition, there should be specific transfer area to reduce the contamination and dirtiness.</p>	Wasted Water from agricultural technology

**Table 4.8 :** (Cont.) Solution model (Makka)

<b>Plans of Wasted Water Solution</b>	<b>Solution</b>
<p>Wasted water from agricultural equipments</p> <ul style="list-style-type: none"> <li>- When transferring lubricant, place an empty gallon under to keep the lubricant for other usage</li> <li>- Old lubricant can be sold at the cost of 60 Baht per gallon</li> <li>- Old lubricant can be smeared on the house's post in order to prevent from ants and termites</li> <li>- Providing the public relations not to open the car wash service on the banks of the river</li> <li>- In case of frequent lubricant transfer, dig a well to store the lubricant stain and cover this well when it is full with stain.</li> <li>- Providing equipments for storing water from car washing or lubricant transfer so that the wasted water does not flow in the river or community</li> <li>- In case of oil stain or dirtiness, cover it with soil</li> <li>- Pour and use lubricant on the garbage pile as a fuel</li> </ul>	<p>Wasted water from agriculture</p>

**Table 4.8 :** (Cont.) Solution model (Makka)

<b>Plans of Wasted Water Solution</b>	<b>Solution</b>
7. Building the earthen dyke: The local researcher plans to build an earthen dyke like a small road along the banks of the river to prevent the community's wasted water from flowing directly to the river	Water from household improvement
8. Providing concrete gutter or PVC pipe to flow wasted water from slush under the house or from bathroom, toilet, kitchen etc. to the fruit plantation.	Wasted water from household improvement
9. Digging a new pond or using the old existing pond to build / connect a pipe or water gutter from the wasted water source of household to flow to the pond.	Wasted water from household elimination
10. Setting up the signs on the banks of the river not to throw wasted water directly to Yom River. In addition, the Sub-District Administrative Organization should emphasize especially on the existing sources, where villagers throw wasted water, or even cancel these sources.	Prevention of wasted water from households and community

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
11. Providing the public relation to the villagers not to wash or clean insecticide tanks, fertilizer containers, chemicals, clothes contaminated with chemicals etc. in Yom River. Apart from this, there should be the prohibition not to wash or clean tractors, agricultural equipments on the banks of the river as well.	Wasted water from agriculture elimination
12. In case of merit activities at the temples, the wasted water from dish washing should not be thrown directly to the river but to the absorbing holes first.	Wasted water from merit activities elimination
13. Garbage Hole managed by the households by digging a 1-meter-deep hole like the absorbing hole. Dry garbage is placed and burnt in the hole. In the case of wet garbage, put the garbage in the hole and cover the hole tightly when it is nearly full with garbage. Then, find and dig the other hole. This hole is applicable in temples when there are merit activities.	Garbage from households and temples elimination

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>14. Sorting out the garbage: This plan can reduce the quantity of garbage by sorting out only the garbage which can be sold such as plastic, glass, paper etc. The monks can also sort out the garbage and the temple commission will sell the sorted garbage and gain money for the temple. The monks can provide the public relation and campaign the villagers to reduce the plastic usage and use other containers like dish, plates or food carrier instead when giving food to them.</p>	Reducing garbage from production sources

Guideline to sort out the garbage of Tupperng villagers:

From the conversation of the way to sort out garbage, there are two categories as follows:

- 1) Normal Garbage consisting of 1) Garbage which can be recycled such as glass, metal, paper, plastic 2) Garbage which cannot be sold such as organic garbage from remnants, vegetables, plants, fresh leaves etc.

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>2) Dangerous Garbage which is contaminated by poisonous chemicals such as fertilizer bags, spray tins, insecticide cans, bulbs, dry cells, batteries etc. These garbage must be buried.</p>	
<p>For the valuable garbage, after sorting out, it can be sold for additional income, exchanged to other material, given to school and school can sell this garbage for an income</p>	
<p>15. Garbage Re-using is to re-use the waste in the original form, that is, to clean and re-use in the prior form of the material.</p>	<p>Reducing garbage from households</p>
<p>Paper, which is used only one side, can be re-used for the other side; glass or plastic bottles, which cannot be sold, can be used as containers or vases. Temples, schools and the Sub-District Administrative Organization should repair the broken chairs in order to save the budget. In addition, in case of households, plastic bottles can be cleaned and used to fill by drinking water. Old newspaper can also be used to wrap the package in order to prevent the crash. In terms of agriculture, the agriculturists should cut and sew 2-3 parts of the ramie sack, put</p>	

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>the paddy in this sack and immerse it in the water for 3-7 days. After the paddy is grown, scatter it to the fields. Moreover, the villagers can use the empty food and fertilizer bags to fill the dry dung and other materials. The broken chair leg can be placed under the flowerpots, jars or buckets for more convenience. Additionally, the big plastic bags can be cleaned and dried and filled the tobacco seeds.</p>	
<p>Non-used buckets or cans can be used as the flowerpots to grow plants or flowers for house decoration. Materials should be fixed and used again. Paper and newspaper can be wrapped as the bags and sold later. Plastic bottles can also be used as the hanging flowerpots for house decoration or the villagers can grow parsley, red onions or small plants.</p>	
<p>In terms of school and the Sub-District Administrative Organization, the papers, which are used only one side, can be re-used for the other side; the beautiful bottles can be used to put small plants as the decorative flowerpots for house and offices. In addition, old buckets can be placed under the dustbins and the old wheels can be half cut and used as the small fish aquariums.</p>	

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>Moreover, the plastic gallon with the narrow neck can be cut and used as hanging flowerpots for growing flowers or small plants. Thus, re-using the garbage can not only be the creativity but also the garbage reduction.</p>	
<p>16. Making Ferment the wet garbage from the Households, like remnants, vegetables, fruits, with the microbial yeast in order to get the useful microbe as follows:</p>	<p>Reducing garbage and eliminating wet garbage from households</p>
<ul style="list-style-type: none"> <li>- Fill clean water in a bucket</li> <li>- Put red sugar and stir</li> <li>- Fill the microbial yeast</li> <li>- Put wet garbage in the fertilizer bags, tie the bag tightly and immerse the bag in the bucket</li> </ul>	

Cover the bucket and immerse the bag for 7 days. The garbage can reduce the bad smell by mixing with water and pour at the smelling places like toilet, garbage piles, water gutters. This garbage can also reduce the stop of the toilet and can be used as the fertilizer.



**Table 4.8 :** (Cont.) Solution model (Makka)

<b>Plans of Wasted Water Solution</b>	<b>Solution</b>
<p>17. Making the compost. The wet garbage can be also easily made as the compost by mixing with water and soil. Then ferment it under the trees by framing the wood plates around. Pour water and cover with soil to prevent from bad smell. The compost will be deposited naturally.</p> <p>The tobacco gardeners can ferment the remnants, vegetables, fruits, twigs, leaves etc. as the organic water fertilizer by mixing wet garbage with water and sugar refuse and fermenting for 7 days. If there is any air bubbles, fill the sugar refuse and ferment for 7 days or until the full decomposition. Before using the fertilizer, mix it with water in the ratio of one part fertilizer per ten parts of water. In addition, use the old plastic bucket as the fermenting bucket, which is placed 2-3 centimeters from the ground, with additional cock for convenient usage.</p>	<p>Reducing the garbage and eliminating wet garbage from households</p>
<p>18. Modification and recycling is the method to use the materials, which cannot be used repeatedly, for new production with decomposition process. For instance, the old paper can be cut or torn and mix with twigs or leaves to</p>	<p>Reducing the garbage from households</p>

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>make the fertilizer by mixing with water and fermenting under the ground with a wood or cemented block. Pour water for 15 days, turn the other side, water and leave for 2-3 months until it can be used as the fertilizer. By this, paper is accelerating the cause of termites helping in decomposition. The earthworms also help in the decomposition. Moreover, the dung of termites and earthworms increase the fertilizer value. Apart from this, the old newspaper can be rolled and weaved in forms of vases or baskets connected with wire. Furthermore, the drinking aluminum cans can be cut in small lines and weaved in forms of flower decorating beautifully by the coconut rods and glued paper. The scraps of the cans can also be put with candles and rolled in forms of flowers for arranging as flower tray in various occasions.</p>	<ul style="list-style-type: none"> <li>- Broken tractor belts can be modified as a cradle or cut in small lines for bundling the tobacco leaves.</li> <li>- Lubricant gallons can be cut and used as the food containers for dogs. It is also can be used as a bowl for fetching water from a well. In addition, empty gallons can be used as buoys for entrapping fish in the river.</li> </ul>

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>19. Making Organic Gas from Dry and Wet Dirt Ferment the wet garbage in a cemented well, cover it and connect it to the gas bucket. Thus, there will be an energy used as a light to animals in the nights. All wet garbage can be fermented by separating in many wells covering all layers. At the beginning, dig a 1 meter diameter hole with 2 meters depth. Cover with soil and place with plastic at the but tom. Then, put wet garbage and cover with soil. Bury 3-4 PVC pipes and connect al holes so that the gas can pass through. Install a turn on/off cock between the holes.</p>	<p>Elimination garbage and waste from community's cultures and traditions</p>
<p>20. The Waste from Temples On Buddhist Holy Day and religious Days, there are some guidelines for the waste from food as follows:</p> <ul style="list-style-type: none"> <li>- Share the remnants to the temple boys</li> <li>- Share the remnants to the villagers</li> <li>- Feed the animals, both at temples and houses, with the remnants</li> <li>- Distribute foods to the low income villagers</li> <li>- Distribute foods to schools according to the lunch project</li> </ul>	<p>Elimination garbage from agriculture</p>

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<ul style="list-style-type: none"> <li>- Sort out the cooked rice and dry it. The rice can be sold to the villagers raising pigs or fish; and the temple can gain money from the sales.</li> <li>- Distribute the foods to the prisoners</li> <li>- Sort out plastic bottles for sales and burn the dry garbage</li> <li>- Encourage not to cook food at the temple but at home in order to reduce the scraps from cooking in temple areas.</li> </ul>	
21. Garbage from Agriculture	Throwing the waste in the river
<ul style="list-style-type: none"> <li>- Burn gloves used for spraying insecticide</li> <li>- Wash insecticide tanks on the dry ground in order to let water flow under the ground easily, do not wash the tanks in the river.</li> <li>- Sort out the insecticide containers; the bottles can be cleaned for sales; plastic bags and paper should be burnt</li> <li>- The empty fertilizer bags can be used to fill the dry tobacco leaves</li> <li>- Insecticide or weeder containers, which cannot be sold, should be buried with 50 centimeters depth under the fields or plantations.</li> </ul>	

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<ul style="list-style-type: none"> <li>- Empty lubricant tins can be sold to the shops.</li> <li>- The bulbs should be buried</li> <li>- Batteries can be sold to the garage</li> <li>- Dry cells should be buried</li> <li>- Wheels and belts can be re-used; belts can be used to bundle the materials and wheels can be cut and used as the containers for dogs or for growing plants</li> </ul>	
<p>22. The Solution for Throwing the Waste and Dirt in Yom River</p>	Lack of participation
<ul style="list-style-type: none"> <li>- Provide knowledge about the effect of throwing garbage and waste in the river through news center</li> <li>- Establish the rules and punishments for anyone throwing the waste in the river</li> <li>- Provide the public relation and ask for cooperation not to throw the waste in the river</li> <li>- Set a patrolling shift to watch out for throwing the waste in the river; take a photo of an accused.</li> <li>- Announce the names of accused for condemnation.</li> </ul>	

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<ul style="list-style-type: none"> <li>- Terminate help for anyone who still throws waste in the Yom River such as the community will not help that person when flooding or not allow community funds.</li> <li>- Provide big dustbins at various places on the banks of the river</li> <li>- Build the consciousness of preservation to the youth and students</li> </ul>	

The Sub-District Administration should provide the budget for garbage trucks to collect garbage on the banks of the river.

23. Public Relations. The materials used in public relations can be started with brochures consisting of pictures and descriptions, which point out the importance and necessity of sorting out garbage before disposed. Significantly, there should be messages conveying the effect of throwing the waste in the river and also the solution, which all parts have to cooperate. Additionally, there should be also the messages explaining the correct ways to get rid of garbage. The brochures are managed by the Sub-District Administrative Organization of Tupperng. Reducing the garbage in households

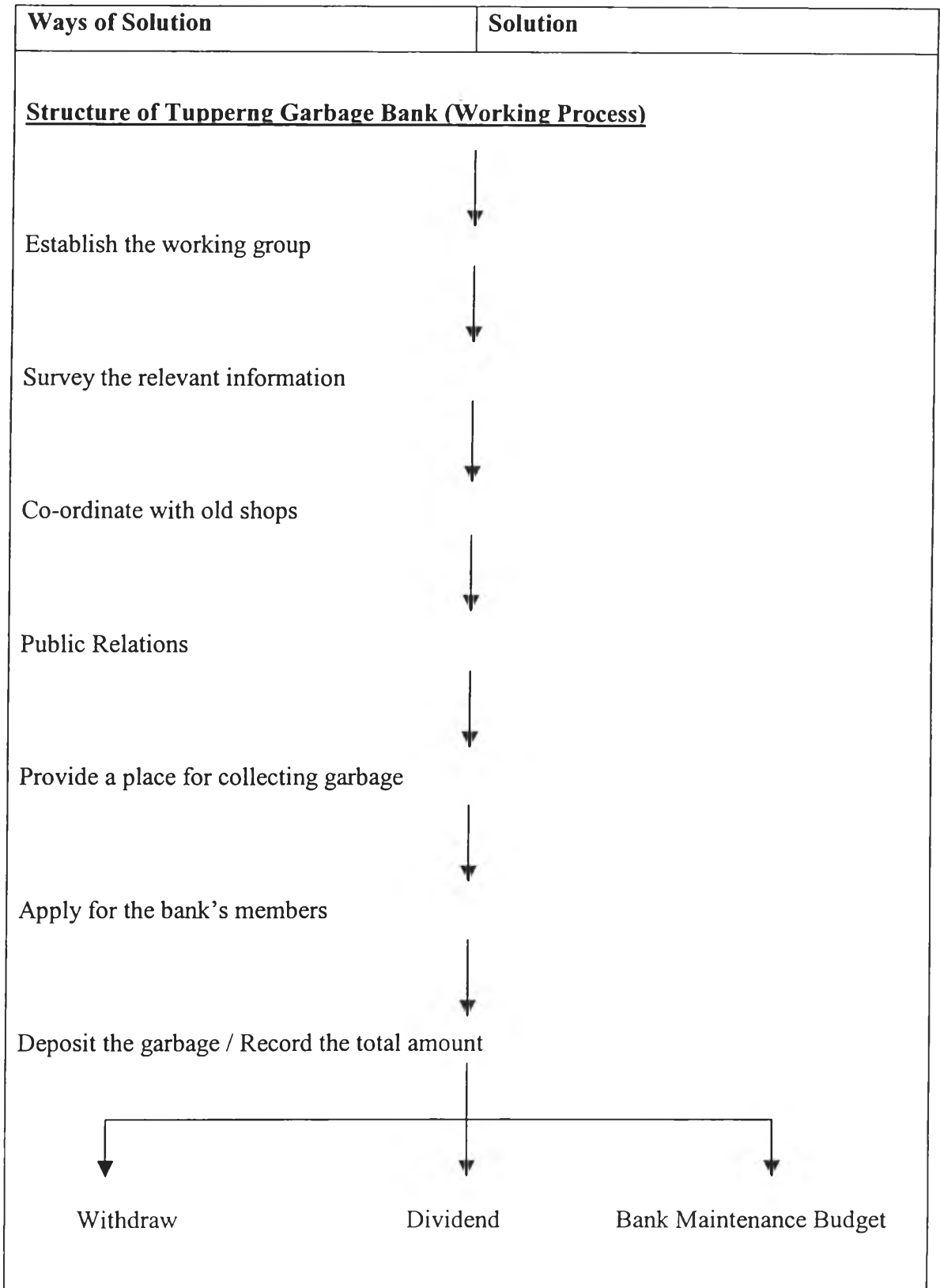
**Table 4.8 :** (Cont.) Solution model (Makka)

<b>Plans of Wasted Water Solution</b>	<b>Solution</b>
<p>The volunteers will manage the advertising car by requesting cooperation from Tupperng Public Health Center for an advertising car with loudspeakers because the Public Health Center usually owns such a car for public relations. By this, the car will be used on official holidays or on Saturday and Sunday in the morning to encourage the villagers for the cooperation of sorting out the waste and garbage and stop throwing the waste in the river. Additionally, the advertising car will be used a week after distributing brochures.</p>	
<p>Using voice-through-line media can be broadcasted every morning for encouraging the villagers to realize and join the garbage sorting out managed by the abbot and the village headman.</p>	
<p>Using personnel media by mouth-to-mouth method. By this, the community leader, the village commission, teachers, students and monks encourage the villagers not to throw the garbage in the river.</p>	

**Table 4.8 :** (Cont.) Solution model (Makka)

Plans of Wasted Water Solution	Solution
<p>Building the understanding and participation in garbage elimination can be done by holding a meeting for villagers' leader, who can publicize and encourage the villagers in the community about the eliminating process later.</p>	
<p><b>Establishing garbage bank</b></p> <p>A Garbage bank is one method encouraging and supporting garbage sorting out. This method starts with the youth and the community and uses the community's areas for operation purposing on the understanding and responsibility of the youth and community. The Tupperng Garbage Bank is used to implant and build the consciousness of sorting out garbage. It also encourages the youth to participate and operate the activity. The principles of the Tupperng Garbage Bank are as follows: The villagers sort out the garbage, which can be sold and evaluate it for money. The bank will record the member's total deposit and the members can withdraw their money on the operation days. Tupperng Garbage Bank is different from others because the members do not need to bring money to the bank, but bring the garbage, which can be sold, to change for deposit.</p>	





#### 4.10.2 Determining the New Roles of Tupperng Community's Multilateral for Waste and Garbage Management

**Table 4.9 :** Role of Organizations in Community

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
<b>1. The villagers, whose households are on the banks of the river</b>	Tupperng villagers, whose households were on the banks of the river had the roles for eliminating the waste correctly and not throwing the waste in the river. They should also sort the garbage before disposal. Tupperng villagers played a great role in sorting the garbage to reduce the waste problem leading to the least amount of useless water. By this, there should be consideration before disposing of garbage; What kind of garbage should be thrown out or what garbage can be re-used. The villagers may not use the garbage by themselves, or the garbage could be modified for other new products. So, they should consider about the garbage, which they think it was useless, to be used for the benefits for themselves or for others. In addition, the shops in the community should sort the garbage out before throwing because some garbage were valuable and could be re-used. Apart from sorting out the garbage, the villagers had a role for managing the wasted water healthily by building an absorbing hole.

Table 4.9 : (Cont.) Role of Organizations in Community

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
<b>2. Formal Community Leaders</b>	<p>Such as a village headman, an assistant village headman, village chief, village superintendent, Lord Mayor of Sub-District Administrative Organization. These persons had the roles to encourage cooperation by the means of public relations in order to build the knowledge and understanding about the healthy correct waste management.</p> <p>There should be a meeting to explain the importance and necessity of villagers' correct garbage management including the garbage sorting out before throwing. Moreover, there should be the strict inspection and not allow the villagers throwing the waste in the river. These persons also have a role to support for providing the dustbins at the ex-throwing points.</p> <p>There should be the public relation and encouragement for garbage sorting out. These persons also should push the solution to the Sub-District Development Plan so that there will be some budget for solving the waste problem in the community.</p>

**Table 4.9 : (Cont.) Role of Organizations in Community**

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
<b>3. Informal Community Leaders</b>	<p>As village seniors or philosophers, village leaders, who managed for public relation, understood and participated in waste management by holding a seminar in order to build the correct understanding. These persons should also encouraged the sorting of garbage and encouraged the villagers to join the activity.</p> <p>Community leaders were the important functions in terms of initializing the activities, publicizing, campaigning the villagers to join the waste management activities. They also connected the cooperation, follow up and evaluate the activities. Therefore, these persons should be eager and had a good vision and community development knowledge. Additionally, they were the coordinators between the governmental sections and villagers in terms of distributing technological knowledge of waste management.</p> <p>The other role was to continuously follow up the waste management and garbage sorting out. These persons also watched out and asked for continuous garbage sorting out. Surely, the community leaders played a great role to create the efficiency of continuous garbage sorting out.</p> <p>Coordinating with local organizations was another role of building the cooperation between the community and local multilateral parts so that all activities could be smoothly conducted. Sometimes, the community needs a help from local organizations and vice versa in terms of waste management.</p>

Table 4.9 : (Cont.) Role of Organizations in Community

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
<b>4. Roles of Teachers and Students</b>	<p>Apart from mainly participating in the community's garbage bank establishment, teachers and students had the additional roles as follows:</p> <ul style="list-style-type: none"> <li>- Sorting out the garbage: This should be programmed as the additional teaching-learning project so that the students could join for the cooperation. It could be added to social subjects because teachers could raise the examples of knowledge and students' participation. In addition, the school could invite an external expert to provide more knowledge or the students could learn from the experience outside the school by the community's waste management, which were consistent with school's waste management project.</li> </ul> <p>Teachers had to continuously implant the value of not littering by the means of public relations or campaigning in order to encourage all relevant parts. Moreover, they should coordinate with other teachers and encouraged them to remind the students that Yom River was not a place to throw garbage.</p> <p>Additionally, teachers should set a good example for garbage sorting to students.</p> <p>Teachers should also provide lessons for students in terms of re-using the garbage as utensils to reassure that garbage could be useful if there was a proper modification.</p>

**Table 4.9 : (Cont.) Role of Organizations in Community**

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
	<p>Then, the activity should be expanded from school to community step by step. At the beginning, the students should join garbage sorting out and then the students could pass on the knowledge and experience to their family. So, they could do the garbage sorting at home and bring the given valuable garbage to school to deposit in the garbage Such as paper or bottles etc. Then, teachers assigned students to follow up their neighbors' garbage sorting out, maybe once a month. If so, the garbage sorting out would be expanded widely in the community and the garbage could be reduced consequently bank.</p>
<p><b>5. Public Health Volunteers and Environmental Preservation Volunteers</b></p>	<p>In terms of multilateral cooperation in order to manage the waste problem, the public health volunteer was the first part, which had the role of concretely solving the problem and the responsibility of building the realization to the villagers.</p> <p>The public health volunteers had to set up the community organization to find a new way for solution and to followed up the activities. Moreover, they were not only the core cooperator in public waste management such as in temples etc. but also the main part for community's healthy environment.</p> <p>Providing knowledge of correct waste management was also the main mission of the public health volunteers.</p>

**Table 4.9 : (Cont.) Role of Organizations in Community**

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
	<p>In addition, they also had the role to continuously exchange knowledge and experience including the ways to get rid of the waste in the community.</p> <p>The volunteers had also the role to continuously coordinate between the community leader and public health center, schools, temples and Sub-District Administrative Organization. Moreover, they should follow up for the progress of the community's waste management including acting as the good example of the persons, who did not throw garbage in the river.</p>
<b>6. Roles of Housewife, Senior and Youth Groups</b>	<p>The role of the housewife, senior and youth groups was to inspect or watch out for the wrong garbage throwing in the community and to observe the source of garbage.</p> <p>There should be also the groups or clubs for taking care of the environment, especially, for Yom River in order to prevent the river from contamination. In addition, there should be the expansion of inspective network covering all villages.</p> <p>The groups should hold a campaign for cleaning Yom River, buildings, households and environment in the community on special days such as on the King's or the Queen's Birthday, Buddhist Lent, Buddha's Birth, Enlightenment and Death, Coronation's Day etc.</p>

**Table 4.9 : (Cont.) Role of Organizations in Community**

<b>Determining the Roles of the Multilateral</b>	
<b>Community Organization</b>	<b>Roles</b>
	<p>Being the good example to others in the community in terms of waste management such as garbage sorting out, garbage re-using, building absorbing holes etc.</p> <p>Teaching the family members to have the public consciousness by not throwing the waste in the river. They should also encourage the realization to the others about not to build the waste problem in the community.</p>
<b>7. Roles of Sub-District Administrative Organization Members</b>	<p>Provide for garbage trucks servicing the villagers on the banks of the river by requesting the budget from Sub-District Administrative Organization</p> <p>Provide budget for building absorbing holes and wasted water treatment to Tupperng Temple because this temple was the center of activities.</p> <p>Be the main part for holding environmental development activities of the community, especially, to clean the banks of the river and to collect the garbage in the river.</p> <p>Be informed, give advice about the complaint and healthy or environmental problems and inspect the problem caused by the waste and dirt.</p> <p>Establish the community's rules and punishments about throwing the waste in the river by holding a seminar.</p>



## **Conclusion**

All multilateral parts concluded that to solve the community's waste problem efficiently, there must be cooperation from various parts, namely, the ones who threw the garbage and the ones who managed the waste problem. Thus, both parts had to solve the problem together. The throwers had to change behaviors and roles and had to be conscious that the more they littered, the worse the effects became. If the community could not control the waste management, there would be widely garbage leading to the dirt, disorder, germ sources and epidemics. However, the persons, who were affected by these results, were the garbage throwers. Therefore, it should be considered what should be done to reduce the quantity of garbage. The villagers should have the correct garbage management based on their capacity and potential. However, all villagers could sort out the garbage before throwing and some garbage could be re-used or modified etc. As a result, the less real garbage was only left (the garbage, which was not used anymore). If the villagers in Tupperng Community helped each another, the quantity of the garbage could be reduced surely and the waste problem in the river could be consequently solved as well.

From the cooperation to find a proper way in order to solve waste problem of Tupperng Community, all relevant parts accepted that the brainstorming was very beneficial to the community and would pass the solution guidelines to Sub-District Plan through the Sub-District Administrative Organization of Tupperng for the next annual budget. Finally, the meeting summarized the brainstorming as follows:

## **Conclusion of Waste Water Solution Thrown in Yom River**

### ***Short-term Plans***

1. Building the absorbing holes
2. Growing plants to absorb the wasted water
3. Providing the wasted water gutter to the non-used ponds
4. Providing the wasted water paths from households to fruit plantations
5. Building the concrete frames to place under wasted water from toilet; using this wasted water to water the trees
6. Providing the specific areas for washing tractors only

***Long-term Plans***

1. Building the sanitation toilets on the banks of the river
2. Building the simple wasted water treatment well
3. Building the buckets for toilets
4. Building the earthen dykes to prevent the wasted water

***Format of Garbage and Dirt Elimination*****Short-term Plans**

1. Building the garbage holes
2. Sorting out the garbage
3. Feed the animals with remnants
4. Providing dustbins for all households
5. Recycling the garbage
6. Re-using the garbage
7. Setting up a sign not to throw any garbage on the banks of the river
8. Producing fuel from dry garbage
9. Burying wet garbage in the farms or gardens
10. Condemning the name of people throwing garbage in the river
11. Canceling the help for people throwing garbage in the river
12. Providing the patrolling shift to look out for throwing garbage in the river
13. Using other materials instead of the materials, which are difficult to be decomposed

**Long-term Plans**

1. The Sub-District Administrative Organization provides for collecting garbage from households
2. Establishing the garbage center or the garbage bank
3. Using wet garbage to produce biological fertilizer
4. Providing big dustbins at various points on the banks of the river
5. Building the consciousness to the youth and students
6. The Sub-District Administrative Organization provides for the budget to buy a garbage truck
7. Canceling the agriculture on the banks of the river

### **Phase III Participatory Evaluation**

#### **4.11 Participatory Evaluation**

The researcher provided the opportunity for the members to select their own evaluation team for the participatory evaluation. The team size was not too large for good flexibility; ten persons were selected, comprised of 1 public health personnel, 2 public health volunteers, 1 teacher, 1 village headman, 1 assistant to the village headman, 2 adolescents, and 2 housewives. The group selected these people because they had good relations in the village, good writing skills, and some experience of inspecting houses. The researcher explained the benefits of the evaluation, and the evaluation methods, for instance, asking easy questions with easy direct answers, and observation of the activities that the villagers had performed after learning the appropriate waste management methods from the 40 leaders. Those activities included, building a percolation pond, waste separation, and making a waste landfill. In the group meeting, as well as all of the research processes, Mr. Prasit Niamkamnerd, health personnel, and Mr. Somchai Yimpin, assistant headman of Moo 1 Village, were appointed the minutes' rapporteurs.

The participatory evaluation in this stage aimed to review the group's working results and to check the problems and successes using the research objectives as a guideline. The interested parties were the research evaluation team and the researcher who gave suggestions to the research participants. The research and the evaluation team worked together to reduce the complexity of the methodology and provide opportunities for all members to create the questions. The evaluation team created the evaluation questions.

The team evaluated the solution form and whether it would be appropriate for the people, if it would be possible to put into practice, how much it would aid the people in general, and what the community's reaction would be. Moreover, the team evaluated the accomplishments of the solution processes from a scenario perspective by adding the adopted solution prototypes to the local development plan of the Sub-district

Administration Organization, to ascertain whether the multilateral partners would adjust their behaviors and adhere to the roles and duties, as in the agreement. The following are the results of the evaluations.

All Tupperng people wished to live in a good, uncontaminated environment with clean water, healthy food, no psychological disturbances or troubles, with cool and shady residences, and safe workplaces. The community and society had a good physical environment that was worth living in, but their daily lifestyles included several activities which frequently left unused and unwanted objects as waste. In the past, there had been no waste management but it did not cause any problems for the community and society because there were not many people, especially no problem with waste and contaminated water in the Yom River. In the past, the river was used for consumption and agriculture, but things had changed recently because the population had increased and the waterways were used to eliminate waste from the community and its places of commerce. People built houses on the riverbank and some of them had agricultural farms. These residences deposited wastewater, waste, and garbage directly into the river. The degree of pollution in the river increased daily and made the river unpleasing, with foul-smelling black water, which could not be used for consumption. The riverine life also suffered.

In recent times, the community's residences near the bank of the Yom River had been rapidly increasing without any planning, which caused physical changes to the community. The people's water-usage behavior had changed, with less reliance on the Yom River. However, one thing remained the same, people still deposited waste into the river, both household wastewater and other waste, which caused visual pollution and affected the people's health with contagious diseases, such as diarrhea, skin diseases and pink-eye.

Recent efforts to solve the problem of waste in Tupperng community had been individual deeds, for instance, environmental hygiene projects were usually conducted by public health personnel and public health volunteers, the "Livable Town with Moral Esteem Project" conducted by the headman of the village (Pooyai Ban), the chief of the

village (Kamnan), and the Yom River Reservation conducted by the subdistrict administration organization to satisfy government policy, but there had been no serious participation from the people as a whole.

Before the study of communal lifestyle related to waste, solutions to the problems of garbage and waste were stimulated by personal interest, especially when the carcasses of animals were found floating in the river and the people could not tolerate the strong smell. Even though it was thought that a government section like the Sub-district Administration Organization must be responsible for organizing discussions to identify preventive measures and solutions to such a problem, the community still had waste problems. This was clearly seen from the village community development meetings because the topic of waste on both sides of the river was always included. Besides, there had been communication with the upstream area via the headman and the chief of the village at the monthly main Amphur Meeting, to reduce waste disposal into the Yom River.

Before taking part in this research project, most of those who took the initiative to solve problems were the head of the village and members of the Sub-district Administration Organization. The solutions were often implemented by inviting all of the village leaders to a meeting to define the magnitude of the problem and inform the villagers about it, but there were no serious continuous efforts to solve the problem afterwards. The next efforts were made by the Public Health Ministry, and the operations were handled by government officials, but no presentations were made in village meetings. Therefore, it was apparent that there was government funding to solve the waste problem, but as before, there were no ongoing efforts to do so.

The research and community leaders together evaluated the prototype solutions for the waste problem in Tupperng. They needed conclusive guidelines from the community through participatory evaluation, to regulate the work to be done in line with the problem situation and the suitability for the community. The research and community leaders together evaluated the process of prototype development by informal observation and inquiry. The results of the evaluation were as follows:

The evaluation team developed a checklist questionnaire to gather personal opinions, which asked the villagers if they felt satisfied with the final solution methods, or not. It was found that most of them felt very satisfied and expected to see the changes in a positive way. They thought that this kind of solution for the waste problem was easy for them to put into practice. When the villagers saw that the research team was starting to find ways to solve the problem, they felt the urge to see positive changes in the environment of their community. They realized that everyone in the community was responsible for the problem of waste and garbage in the river, because everyone took part in polluting it. When the government failed to solve the problem, they had to join together to solve the problem themselves. The residents felt satisfied with their own way of solving the problem without imposition, but for the love of their community. The evaluation team also noticed that when the relatives, and neighbors of the research team came across an example of appropriate waste disposal by the group, they became aware that they were all willing to follow the given guidelines to solve the problem of waste. The evaluation team could observe the extension of the results, beginning with the relatives and neighbors who followed the research team to manage waste disposal. They always attended their meetings, which might be called a social movement, because they proved that the people in the community could handle their own problem without waiting for the government. They also recognized that it was necessary for all people in the community to handle their waste responsibly. One must know his own duty as the one who makes the waste, not the one who leaves the waste; the waste-maker must dispose of the waste in a way that suits the environment, and share the social responsibility of the community. Tupperng people started to realize that they were all responsible for the community's problem and need to participate with the other sections of the community to solve it. The fact that some vested interests were included in the research team urged the villagers to appreciate their Tupperng identity. It was found from the evaluation that the research team convinced their neighbors and relatives to take part in the community activities to deal with the waste problem. It was also found that the villagers separated and gathered the waste for burning and burial, instead of putting it into the river. Moreover, the research team evaluated the prototype solutions for the waste problem by brainstorming using the Buddhist Four Noble Truths. They asked 60 villagers about the suitability of the adopted solutions. The evaluation results were as follows:

#### 4.11.1 Evaluation Results: suitability and practicality of the adopted solutions for solving the waste problem in the riverbank community

**Table 4.10 :** Results from evaluating the solutions for the waste problem in Tupperng by the local researchers.

Solution guidelines	Suitable	Moderate	Not Suitable
- This problem could be solved with the participation of all Tupperng people	60	-	-
- Used the principle of solving the problem at its origin	60	-	-
- Had both short-term and long-term guidelines to be chosen according to the situation	60	-	-
<b>Solutions for the Wastewater Problem (after experiencing extension of the result from the research team)</b>			
1. Build a percolation pond	60	-	-
2. Build toilets near the riverbank	51	8	-
3. Grow plants to absorb the wastewater	58	2	-
4. Build a wastewater holding pond	60	-	-
5. Build a filtering pond for the toilets	57	3	-
6. Build a dike to block wastewater from flowing into the river	60	-	-
7. Build pipelines to drain wastewater into an unused water holding pond	54	6	-
8. Build pipelines to drain wastewater from the houses to the orchards	59	1	-

**Table 4.10 :** (Cont.) Results from evaluating the solutions for the waste problem in Tuppernng by the local researchers.

Solution guidelines	Suitable	Moderate	Not Suitable
<b>Solutions for the Wastewater Problem (after experiencing extension of the result from the research team)</b>			
9. Build a percolation pond	60	-	
10. Build toilets near the riverbank	51	8	
11. Grow plants to absorb the wastewater	58	2	
12. Build a wastewater holding pond	60	-	
13. Build a filtering pond for the toilets	57	3	
14. Build a dike to block wastewater from flowing into the river	60	-	
15. Build pipelines to drain wastewater into an unused water holding pond	54	6	
16. Build pipelines to drain wastewater from the houses to the orchards	59	1	
<b>Solutions for Waste and Garbage Management</b>			
17. Make a waste landfill	60	-	
18. Separate the waste into types	60	-	
19. Take food remnants to feed animals	59	1	
20. Supply garbage cans for every houses	60	-	
21. Have the Sub-district Administration Organization provide a service to take waste from the houses to the landfill	60	-	
22. Set up a Waste Center or Waste Bank	56	4	
23. Reform and recycle the waste	57	3	
24. Reuse the waste	56	4	



**Table 4.10 :** (Cont.) Results from evaluating the solutions for the waste problem in Tupperng by the local researchers.

<b>Solution guidelines</b>	<b>Suitable</b>	<b>Moderate</b>	<b>Not Suitable</b>
25. Affix a sign “No Dumping Near the Riverbank”	50	8	2
26. Make biophysical fertilizers	51	9	-
27. Use dry garbage as fuel	55	3	2
28. Prohibit agricultural farms near the riverbank	57 60	3	-
29. Bury the waste on the farms		-	-
30. Publicly condemn the names of those who dump waste in the river	60	-	-
23. Boycott those who dump waste in the river by refusing help from the community	50	7	3
24. Have guards watch out for anyone dumping garbage in the river	57	3	-
25. Designate an area for cleaning plowing trucks	58	2	-
26. Make a concrete circle to hold wastewater from toilets and bathrooms before irrigating plants	55	4	1
27. Use other compensated objects	60	-	-
28. Build awareness to preserve the community and the river	60	-	-
29. Set up regulations for not dumping waste in the river	60	-	-
30. Publicize the act of not dumping waste in the river through the local broadcasting service	60	-	-
31. Create good role models	60	-	-

Evaluation of the villagers' opinions about the suitability of these solution prototypes showed that most agreed that these solution processes were suitable and that the problem could be solved with the participation of all Tupperng people, especially those who were initially the cause of the problem.

Moreover, the research team evaluated the villagers' ability to follow the solution processes taken from the brainstorming, according to the Buddhist Four Noble Truths. They interrogated 60 people by simple random sampling of households residing along the river. All of them, big or small, had an equal opportunity to be evaluated. The representatives of the families were asked if they could follow the solution processes or not. The results were as follows:

**Table 4.11 :** Results from evaluating the ability for the waste problem in Tupperng by the local researchers.

<b>Solution guidelines</b>	<b>Can do</b>	<b>Cannot Do</b>
<b>Solutions for the Wastewater Problem</b>		
1. Build a percolation pond	60	-
2. Build toilets near the riverbank	58	2
3. Grow plants to absorb the wastewater	60	-
4. Build a wastewater holding pond	59	1
5. Build a filtering pond for the toilets	60	-
6. Build a dike to block wastewater from flowing into the river	Sub-district Administration Organization	
7. Build pipelines to drain wastewater to the unused-water holding pond	40	20
8. Build pipelines to drain wastewater from the houses to the orchard	60	-
<b>Solutions for Waste and Garbage Management</b>		
9. Make a waste landfill	60	-
10. Separate the waste into types	60	-
11. Take food remnants to feed animals	60	-
12. Supply garbage cans for every house	60	-

**Table 4.11 :** (Cont.) Results from evaluating the ability for the waste problem in Tupperng by the local researchers.

<b>Solution guidelines</b>	<b>Can do</b>	<b>Cannot Do</b>
<b>Solutions for Waste and Garbage Management</b>		
13. Have the Sub-district Administration Organization provide a service to take waste from the houses to the landfill	Sub-district Administration Organization	
14. Set up a Waste Center or Waste Bank	The schools	
15. Reform and recycle the waste	60	-
16. Reuse the waste	60	-
17. Affix the sign "No Garbage Dumping Near the Riverbank"	Sub-district Administration Organization	
18. Make biophysical fertilizers	56	4
19. Use dry garbage as fuel	51	9
20. Prohibit agricultural farms near the riverbank	52	8
21. Bury the waste on the farm	60	-
22. Publicly condemn the names of those who dump waste into the river	60 60	- -
26. Boycott those who dump waste into the river by refusing the help of the community	60	-
26. Have guards watch out for anyone dumping garbage into the river	60	-
26. Provide an area for cleaning plowing trucks	60	-
27. Make a concrete circle to hold wastewater from toilets and bathrooms before irrigating plants	60	-
28. Use other compensated objects	60	-
29. Build awareness to preserve the community and the river	60	-
30. Set up regulations for not dumping waste into the river	Sub-district Administration Organization	
31. Publicize the act of not dumping waste in the river through the local broadcasting service	The Executives	
32. Create good role models	60	-

Most of the villagers thought that they could solve the wastewater and waste problems in the community without help from the government. From the activities derived by the intellect of the Tupperng people, most of them were able to do it by focusing on using local resources and minimum expense.

#### **4.11.2 Accomplishment of the solution prototype in a tangible vision**

From the results of the evaluation on the activities that could be done in a short period according to the solution prototype of the waste problem in the community, it was found that Tupperng people reused wet garbage from food remnants and weeds as composted fertilizers, to reduce the amount of wet garbage left in the Yom River. *“From the brainstorming we found that it was suitable for making composted fertilizers. All of the team agreed with the idea, so we started the experiment because there was a large amount of wet garbage in the community, especially during religious festivals,”* said Mr. Somchai Yimpin, deputy head of the village and member of the local research team. Moreover, the community leaders were able to learn about making composted fertilizers from another community who had already experienced training. The people in that community separated wet garbage and food remnants from weeds into separate buckets and made them into composted fertilizers for use in the community. *“To recycle wet garbage as composted fertilizer is a good activity and benefits the whole community because we are farmers,”* Mr. Somchai added (Mr. Somchai Yimpin, deputy head of the village).

#### **Evaluation of garbage management at the household level**

Consideration of waste management at the household level of the people in Tupperng community, after dissemination of the solution guidelines, was based on the waste methods management in their homes: the methods they used to dispose of the garbage, how and why. The evaluation was conducted with 60 houses by observation and interrogation of house representative, one person per house.

It was found that 51 houses destroyed the garbage on their property, which was the most common method of waste disposal. Another 9 disposed of garbage in the garbage cans provided by the Sub-district Administration Organization.

It was found that 40 houses dug a pit to hold and burn the garbage, which was most common. 7 houses made composted fertilizers out of the garbage, and 4 houses fed the garbage to animals. These waste disposal methods were taught or transferred by the research team, and it took 3 months for the results to be extended. Formerly, before the project had been implemented, people usually disposed of their waste on the riverbank, where the heap remained. When someone dumped waste, others followed, repeatedly.

### **Garbage categorization at the household level after dissemination of the solution guidelines by the research team**

Consideration of garbage categorization behaviors at the household level included questions about the average amount of garbage per day, categorization by type of garbage, types of garbage categorized by their benefits, and trading places for categorized garbage. The results are as follows:

A survey of the average amount of garbage per day found that 25 households had 1-3 liters of garbage, 12 had 4-6 liters, 13 7-9 liters, and 10 had more than 10 liters of garbage per day.

For categorization according to the type of garbage, it was found that 55 houses always separated the garbage into types, 3 houses sometimes did, and 2 houses never did at all, because there were only 2 people in the family and there was not much garbage.

As for the types of categorized garbage, 54 houses separated wet garbage from other garbage and the other 6 houses sometimes did so, depending on their free time. 58 houses separated dry garbage e.g. pieces of paper, newspaper, cloth, glass, and plastic before selling them, but the other 2 houses did not separate them but threw them away with other kinds of garbage. For dangerous garbage, 52 houses separated old batteries, spray bottles, termite and mosquito killers from other garbage by keeping them in separate bags before burying them. Many houses separated used light bulbs

and tubes by wrapping them with newspaper before placing them in separate bags. Another 8 houses never separated dangerous garbage from other garbage because they hardly ever had this type of garbage.

For reuse of garbage, most of the sample groups separated wet garbage, such as food remnants and weeds to make fertilizer, and many of them made feed for their animals, while others made composted fertilizers. Most of the sample groups separated dry garbage for sale, while some of them modified the garbage for reuse, for example, plastic bottles and plastic buckets were washed and cleaned and refilled with drinking water, and newspapers were used for cigarette papers.

For recycling of garbage, 38 houses sold the separated garbage to hawkers who came to buy old articles at their houses, 16 houses sold the garbage to sided trailers, 4 houses sold the garbage to shops outside the community, and 2 houses gave the garbage free to those who earned their living by finding and selling recyclable materials.

### **Evaluation of wastewater management**

As for the management of the wastewater after dissemination of the solution guidelines by the research team, the village committee built up a road to form a small dike blocking the riverbank throughout the community area to prevent the villagers from directly discarding wastewater into the Yom River.

As for construction of percolation ponds at the time of the evaluation, it was found that 14 houses had already finished their ponds, while the others were under construction. It was also found that 2 houses had already completed the task of running wastewater pipelines to irrigate their plants.

It was found that two religious ceremonies had been held after the dissemination of the wastewater management processes. One house had a wedding and another a funeral. Both houses prepared a large garbage storage pit and a percolation pond for wastewater in the kitchen area. The villagers showed increased responsibility for wastewater management. They no longer disposed of waste and wastewater into the Yom River.

### **Evaluation of people's participation in community waste management activities**

The consideration of people's participation in community activities concerning waste management was based on 3 factors, (1) their personal experiences in waste management activities, (2) how they convinced their relatives and neighbors to join the activities, and (3) the willingness of these people to join the activities organized by the research team. The results were as follows:

The evaluation showed that most of the sample groups used to join community activities, such as cleaning both sides of the riverbank on Mother's Day (August 12) and Father's Day (December 5). The community leaders informed the villagers of the activities from the community information dissemination tower. On those days, people united together to collect garbage, cut the grass near the riverbank, and clean public places. Some residents did not join in the activities because they were busy working. Moreover, most of the sample groups had to convince their neighbors to join the activities. Non-participatory observation of waste disposal traces on the riverbank revealed that the disposal of waste into the Yom River had greatly decreased compared with previous times.

#### **4.11.3 Evaluation of the research project by the co-research team**

The team made evaluations by interviewing local researchers concerned with the operations needed to solve the problem of waste in the community. It was found that the local research team cooperated well and joined in this mission, and consequently became more familiar and close to each other. To express themselves and share their opinions was very beneficial to the group each step of the way. Each step was very important for promoting local brainpower to solve the waste problem. The team evaluated the operations together, and also decided upon the processes used to solve the waste problem in the community by observing and interviewing the members of the local research team.

Evaluation was conducted by setting up a stage to talk about the operations of solving the waste problem, and to inquire about how much cooperation the research team received. During the talk, the evaluation team gave 40 members of the research team the opportunity to voice their opinions, explain what they had learned from the work, and what benefits they had received. The content can be summarized as follows:

1. The research team and the villagers knew the cause of the waste problem after they participated in learning and analyzing their lifestyles concerning waste.
2. They realized that the problem of waste largely affected their families, the community and the water. They realized that their waste was the cause of the polluted community and the contaminated water in the Yom River. Moreover, from their participation in the lifestyle study, all of the people in the community felt that they must be jointly responsible for this problem, because they were the ones who deposited waste into the river.
3. The organizations, formal and informal, joined in the meetings to guide the way, so they could solve the problems together. The community received very pleasing solution processes and knew the processes that led them to change to appropriate behaviors, in accordance with the new roles of the vested interests.
4. A network was created for participatory solving the problem of waste. The community leaders acquired new roles as waste management leaders and being a good role model for others to follow. They also helped convince more people to join the work.
5. The villagers performed some straightforward research and solved the problems based on the principle of cause and effect, in accord with the Buddhist Principles (The Four Noble Truths) and relied upon themselves to accomplish their goal.



#### 4.11.4 Problems and Obstacles

The local research team mentioned the problem of taking time to join the activities. Some in the leader group had different ideas, so they used the Buddhist principle of cause and effect to clarify the conflicts until they finally understood the principles of teamwork. The fact that everybody joined the consideration, the operations and the benefits, made them feel that they were all part of the team, which led to sustainable solutions and development of the people's capacity. The variety of ideas was very useful for working in a team to prevent and solve the problems of waste in the community, because these ideas let them become acquainted with each other's different proficiencies. If they could gather all those with the same ideas to work in a team, the work could be successfully completed more quickly than through brainstorming. The community needed to be aware of the problem, the cause, and what the community needed to do to solve it; for example, the manpower, the volunteers, the committee, and the social costs existing in the community. They also had to consider what they needed from the government or private sector; for example, common knowledge, technical knowledge, services, and budget. Once the needs were identified, the community could obtain the resources needed to support the work.

All the community leaders took part in all of the projects and activities. They sent representatives from their families if they happened to be busy with some other work. Moreover, these representatives knew as much as they did, because they always relayed the information to them before sending them to join in the activities. These facts reflect the participation in perceiving and relaying the knowledge to solve problems, and the effects on the community. Together, they grasped and paid attention to the problem and exhibited a property-owner status, so they knew what needed to be done and could solve the problem according to the needs of the community, which was done by developing people's potential.

## **4.12 Evaluation by Research**

The researcher evaluated the lifestyle achievements of the community concerning the management of waste, and whether the community could successfully achieve the task goals, or not. The evaluation was conducted by analyzing and processing the conclusions of whether and how the community understood the situation and the causes of waste in the community. It also evaluated whether and how the community dealt with the problem until they learned to understand themselves the origins of the main causes in relation to their lifestyles. The researcher then evaluated the process of solving the waste problem and whether it could translate the accomplishments of sustainable solutions or not, and how the community benefited from this participatory study. The evaluation can be presented as follows:

### **4.12.1 Evaluation of the community lifestyle study concerning waste**

In the study of the community lifestyles concerning waste, the researcher and the local research all had important roles in creating participation and understanding of the situation in the community. The researcher and the local research team used special techniques to study the lifestyles until they discovered that the source of the waste problem was the social behaviors of the community. The study concentrated on all-round aspects of their lifestyles, which stimulated the community to recognize the source of the problem and evaluate their own mishandling of waste materials, and the problems they caused the community, which in turn led them to see what they needed to do to solve their waste problem.

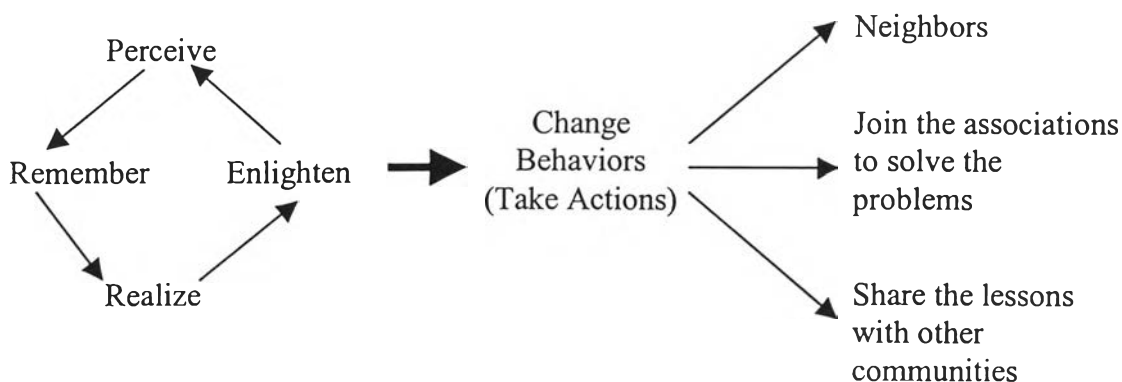
To find the source of the waste problem, the researcher and the community leaders together studied the community lifestyles that were concerned with waste, to get evidentiary information that would lead to a solution that was in accord with the community's problem and suitable for each target group. The methods used in the study process, to find the source of waste and to consider the most suitable solutions, were observation, participatory and non-participatory residents, enquiry, group conversation, and group debate. It was found from the villagers' research that the community leaders and the villagers did perceive the source of the community's

problem. This was an important discovery and it took time and patience to cause them see the truth together. The learning procedure helped them to understand the situation, which was the main factor in finding the solution that solved the problem at its heart. Each stage of the process was quite difficult for the villagers to perform by themselves after the researchers had left the area. However, it was found from the evaluation of the group of community leaders that they did continue the operations after the researchers had left. This may be evaluated from the previous characteristics and outstanding leadership roles of some members of the research team, for instance, the public health personnel, and the teachers who had teamed-up well and understood the research process.

This participatory research could be regarded as a way to build the strength of the villagers' organization, to enable the members to study information themselves and record the facts found from their own studies. Strengthening the participatory aspect of the community organization led to the villagers being able to create prototype solutions that they could perform themselves in every situation, and the village organization was consequently strengthened by systematic learning through the local research process. This knowledge was enlarged and dispersed to the groups and organizations as a network, composed of the group leaders and the villager organization. This may be described as the development of the village organization network. This research aimed to build intellectual strength and knowledge for the village organization, to solve the waste problem in their community logically.

Studying the waste-related lifestyles of the people in Tupperng community provided an opportunity for the research team to learn about the real lives of the Tupperng people, and to learn about the behaviors that caused waste from various sources. The answers to these questions were to be found in the village. The study of community lifestyles encouraged the people to assume and observe their behaviors thoroughly and carefully, as they had never paid serious attention to these things before. From the study, people acquired the learning procedure, Buddhist enlightenment, and a sense of responsibility for the daily activities that had damaging effects on their health and environment. Participating in the study was also choosing the way to enlightenment

and it encouraged the people to learn, analyze and interpret the situation until they gradually changed other persons' perceptions, awareness and behaviors concerning the problem of waste, as illustrated in the following figure.



**Figure 4.5 :** The villagers' learning process

#### **4.12.2 Evaluation of the participatory prototype solutions for the waste problem**

This stage was designed to plan solving the problem systematically using the principles of the Four Noble Truths through brainstorming of community leaders and the villagers, to find ways to solve the waste problem. This might be termed participatory planning by local intellect. It provided opportunities for all research participants to exchange knowledge, experiences, and information, assuming that they already knew the problem situation from the study, so that everybody understood the sources of the problem, their limitations, needs and the potential of the community to find appropriate ways to solve the problem according to its causes and factors in Buddhist ways, and in accord with their lifestyles.

The methods of solving the waste problem in Tupperng were taken from the various ideas of those taking in the brainstorming. These people were not only individuals or groups, but the ones systematically sought to be representatives of the group, the village organization, and the general populace who joined the local research team. They expressed their ideas in the brainstorming session strongly, on the basis of democratic participation. This brainpower helped the community to resolve the complexity of the waste problem with participatory procedures according to the

Buddhist Four Noble Truths. It helped the villagers consider ways to solve the problem systematically. The Tupperng people succeeded in the brainstorming and created suitable solution processes, as follows:

1. The villagers believed in the potential of the village organization to solve the waste problem. Many of the things that they knew were precisely what had already happened in the village, and many minor problems were often related and important to understanding the main problem and the ways to solve it.
2. The research team gave important information from actual experience and daily situations, so that the community could use its methods of thinking, classifying, and analyzing, so they would be prepared for the real situation.
3. The community performed holistic brainstorming to solve the waste problem, because it was a complex and correlative problem that was hard for only one person or only some parties to solve. The only way for the solutions to be implemented was to mobilize the power and resources of the community and link the problems together to analyze and consider the most suitable methods.
4. The villagers had to play the principal role in the operations because it was their problem and they were the community owners. They needed to think, decide, plan, and perform the activities within the scope of their own abilities.
5. It was important that the representatives of every community group or party took part in the activities so that the team would get correct information and everybody would learn to appreciate the importance of taking part in this effective solution as a whole community.
6. This was a sustainable solution procedure for the waste problem in the community, which focused on reducing garbage and waste using a variety of methods. It showed the importance of the people's participation in undertaking activities to create the power for a strong, sustainable and continuous solution to the waste problem.

The participants among the vested interests or the bilateral associates who set up the solution guidelines were the volunteers, the villagers, the formal and informal community leaders, the local government officers, and the researchers. These associates were the most important factors bringing success to the solution process in Tupperng community. Every section received the information and was sympathetic to the problem. They joined in the meeting during the brainstorming to find ways to manage the waste left in the Yom River. This participation led the residents to work and study as a team to achieve the primary objective, which was to eradicate the habit of disposing of garbage in the river. It was in line with the concept and theory of the triangle moving the mountain (Prawet Wasi, 1998) by using the various and different strong points of each associate to bolster the weak points of the other associates in the working procedure. Moreover, coordination was made at all levels. Each associate coordinated with the others for the sake of their own community.

#### **4.12.3 Participatory Evaluation**

In this research, the opportunity was provided for the research team to review the group's work, and to inspect the problems and successes. The vested interests were at the center of the evaluation, while the researchers only gave advice to the villagers who joined the research project. The researchers and the villagers together evaluated the operation by reducing the complexity of the methodology and providing opportunities for all members to ask questions easily.

The evaluation was conducted according to its objectives, which was to evaluate whether it was practical for the people or not, if it was possible to put into practice, if it was beneficial to the general populace, and to determine the community's reaction. Moreover, the team evaluated achievement of the solution processes in a scenario context by adding the solution processes to the local development plan of the Sub-district Administration Organization, to see if the multilateral group adjusted its behaviors and followed the roles and duties as agreed, or not. All of these could be evaluated from inquiry and data gathering, which could be done by the villagers themselves.

From the participatory evaluation of the Tupperng people, the feedback from the villagers gave certainty that these solution processes were suitable for the community and it was possible for every family to manage the waste accordingly. The experience from this research let the villagers, and the community, know the operational results in a tangible form that they could all accept. Moreover, throughout the research, the villagers realized the benefits of studying the problem by themselves. They became confident that they could study and learn, so a feeling of self-reliance arose, which led to the learning process and continuous and sustainable development.

To create the processes and methods of evaluation, the villagers brainstormed with the vested interests to set up processes, guidelines, and methods together. This was composed of 2 main parts, (1) regulation of the methods and contents, and (2) collecting, processing, and summarizing the data. The goal was to conclude the evaluation results together. In this evaluation, the team performed the task so well that the villagers felt the sense of being the creators, which lead to the learning procedure and a continuous, sustainable development.

To create the evaluation team, the researcher gave the group members an opportunity to design their own team that would lead the evaluation. It was comprised of a minimal numbers of members for ease of management. Sometimes, the indicators were not academically correct, so the researcher guided the evaluation methods until they understood and produced the appropriate questions.

As for the methods of data collection, the group systematically collected data and checked the questions by inquiring of the residents in 60 homes. The reactions toward the co-researching team were also studied. The researchers and the vested interests then analyzed and summarized the evaluation. The conclusions reflected the facts holistically, that this was a good and useful project for the community and served the objectives of the research.

#### **4.12.4 The holistic evaluation of the study on waste management in the community near the riverbank**

The evaluation of the study on waste management in the community after the research was a holistic consideration at the community level for both sides of the river, based on the 3 following parts.

1. Community factors e.g. readiness potential and factors supporting community participation
2. Administration process, including education, coordination and local intellect, for putting the solution processes of the waste problem into action.
3. The project results and the impact on the community e.g. the research results for the community

##### **4.12.4.1 Community Factors**

###### **Potential and readiness**

The potential and readiness of the community are initial factors that will lead to successful waste management in the community. Any community having the potential and the readiness will have more chances for success. The Tupperng community was one such community in Sukhothai Province, with high potential and readiness. The details are as follows:

###### *- The human resources who joined the research*

The human resources in the community were at the heart of solving the community's problem. The community organization could not be strengthened if the community leaders and members lacked the intellect and knowledge to regulate the problem points and develop alternative activities, management, and the knowledge transfer process, or lacked developmental vision. Therefore, "human preparation" was the main factor for success in solving the problem at the community level. From the recent research project, it was found that the local research team was very efficient, so the project met with great success.



The researcher had imbedded himself into the village for almost 2 years, and had conducted the research with the community leaders who were members of the research team at every stage. The researcher had observed the community leaders, and found that many of them had outstanding characteristics.

The characteristics demonstrated by the organizational representatives or leaders attending the project were as follows:

1. Take initiative and be creative. “Know all aspects well”. Able to present the alternative solutions appropriately.
2. Able to analyze the problem of waste for both short and long-term solutions. Think thoroughly and integrate the ideas into workable practices.
3. Have a goal memory. Eager to learn. Can manage a good learning system and seek knowledge that can be used in the presentation.
4. Able to manage and coordinate work with other people e.g. manage data collected from fieldwork, observe the villagers’ behaviors, and coordinate group discussions.
5. Have a serious intention to become a member of the project. Express self-sacrifice for the public benefit. Attend every activity of the research project.
6. Convince other people, present alternatives, explain the vision concerning waste management to other group members, and disseminate the solution processes to the community.
7. Understand the community lifestyles, the world, and Buddha’s teachings, especially the Four Noble Truths, and updates of community situations.
8. Respect other people’s opinions. Manage self-control and accept blame with a just mind.
9. Be accepted by the villagers.
10. Have strong deals; adhere to principles.

These are the characteristics of all the research participants, which can be regarded as one of the community factors making the project successful.

- *Characteristics of the community leaders*

The characteristics of the community leaders played an important role in encouraging the community to have enough potential and readiness to coordinate with others in completing the task. If the leaders are strong, the chances of success are high. If the leaders are weak, the chances of success are low. The community leader in Ban Tupperng was a good leader who understood the locality well, had a good temperament, and was environmentally aware. He was diligent and attentive to work, honest, patient, open to self-sacrifice, had a position vision of the future, was eager to learn, and compliant. These characteristics could be observed in the group discussions, private conversations and actual practice.

#### **4.12.4.2 Supporting factors for community participation**

The 40 stakeholder representatives of Tupperng community willingly took part in this research to solve the problem of waste until they developed the solution processes that suited their community and could be implemented. The reasons for such a high degree of participation were as follows.

1. House location. This was one factor causing good participation between the Tupperng people. They built houses in the same area as a community, especially in groups of relatives, which is characteristic of Thai families. This helped increase familiarity among the people in the community.

This was one of the most important factors affecting the people's participation in solving the problem and leading to a highly strengthened community. Participation started from analysis of the waste situation, through planning solutions, follow-up and evaluation. Because the villagers were living in same area and faced the same problem, wastewater, they felt sympathetic with each other and were willing to cooperate to solve the problem. When the community leaders were trying to solve the problem, villagers in the same area were motivated to join in. Eventually, more and more people

came to join in. Therefore, the physical characteristic of building their houses as one community was important in creating the natural accumulation of members, leading to participation in solving the problem.

2. Transportation. The transportation of today, with roads cutting through the village, is different from rowing boats along the river, as was done in the past. However, in the past, the villagers were able to greet the people they knew when they rowed past their houses. Even the transportation route has changed to a roadway, but the greetings are still the same. More convenient transportation somehow made participation easier.

Transportation is regarded as one the supporting factors for participation, because people with personal familiarity will naturally convince each other to join in the work.

3. Communication. Communication is another supporting factor that helped the people participate in the solution. Current communication had changed little from that of the past, because the people in this basic society retained high degrees of informality, so they disseminated news by word of mouth. Even though the telephone lines had reached the area, these people still preferred to talk directly with the other person. This style of news dissemination created good relations among the villagers, giving them a sense of being in the same group, so it was easier to create like feelings and use personal relationships to convince them to join in. The news dissemination tower was another interesting aspect that could inform the villagers about the operations of the solution team. This factor affected the participation of people in every step of the research.

4. Society. The social condition of the Tupperng community was good and favorable. This primary society possessed a very high degree of familiarity. The people had stronger interpersonal relationships than formal relationships. They were very kind to each other, and often shared their surplus fruit and vegetables with their neighbors. This showed a social interdependence that was continually evident, and which created

high degrees of familiarity, commitment, and team characteristics, so it was easy for them to be gathered into groups when a problem occurred or help was needed, for they naturally felt united and considerate of each other.

The social condition factor helped in creating participation in solving the waste problem, from the study of lifestyles, through planning solutions, follow-up, and evaluation, because the familiarity caused by the agricultural society in which they lived helped them to understand, and inspired them to solve the problem.

1. **Culture and tradition.** The most important culture found in the Tupperng community was the agricultural one. This helped in group gatherings and was the reason why it was easy for them to be gathered into groups for the research project. Tobacco agriculture needed the participation of the people in the neighborhood, be they relatives or friends, because it was hard work that could not be done alone. Even when it flooded, the villagers took turns to help block the water. All of these communal activities made them feel close and sympathetic with each other from the past until today. Moreover, traditional festivals were another reason for them to come together in groups. Buddhist society has many religious festivals and traditions that allow the people to meet in groups, so they build firm relationships within the community, which also assisted in raising the level of participation.

Culture and tradition is another important factor that aided in participation and the feeling to be involved in the operations. This factor affected the participation to solve waste problem in high level, from the study of lifestyles to the solution planning, the follow-up and the evaluation.

#### **4.12.4.2 Administrative Process**

##### **1) Process of Learning and Problem-solving**

According to the group seminar on lifestyle related to waste, the people in the Tupperng Community acknowledged that the Yom River would always be polluted in the dry season. The water had no movement and could not be used. In general, the people of the Tupperng community initially knew the effects of their daily garbage and

garbage problem from the state of the water in the Yom River, but they still did not care enough about the cause of it and nobody wanted to determine what they should do and where they should start. However, they were willing to join the research team because the water in the river was too contaminated for use and it affected their lifestyles so much that they could not tolerate it anymore. Moreover, the community had a formal and natural leader who could see the problem and possessed foresight, so he wanted to join the research project to find a suitable solution to the problem. The villagers wanted to see the solution in Thai ways based on the locality and nature of the problem itself and the nature of the people in the process. It was easy to elicit participation in the research because the people who were living with the problem were willing to help. The people in the Tupperng community all cooperated and worked well together. The approach to learning and solving the problem of the Tupperng people is described, as follows:

- *The study of the waste-related lifestyles of the community near the riverbank*

In studying the lifestyles of the community near the riverbank, the local research team created relations and cooperation among the researchers and the vested interests, or bilateral associates, in the community by exchanging and learning both the methods and the contexts of the community in all aspects related to waste. They revealed the community's lifestyles related to the management of waste. The villagers were able to understand from the evidentiary information that their social behaviors produced the waste problem. The villagers learned the source of the problem through a systematic analysis of their lifestyles with help from the researchers and created new knowledge from finding the truth about phenomena and their social behaviors concerning waste management.

The research team participated and learnt about the lifestyles of Tupperng community by accessing social facts through the process of observing, inquiring, talking, and recording the behaviors experienced and the evidence. This led to an understanding of ideas, thoughts, and behaviors that contaminated the Yom River in the social and cultural context of the lifestyles of the Tupperng community. It also

provided an opportunity for exchange, and to learn about the lifestyles of the community itself, in the communal context regarding the aspects of waste from working, consuming, festivals and traditions, and in the context of the values and beliefs of the people of the Tupperng community. The characteristics of the Tupperng people were important indicators of the social behaviors related to managing waste. The vested interests collected data, recorded what they knew, summarized the scattered understandings into related categories, as a holistic feature that revealed a clear picture of the lifestyles related to waste.

The process of learning about the problem by studying their lifestyles enabled the Tupperng people to understand the process of waste creation in the community and grasp the real nature of the problem. Moreover, they were enabled to understand themselves, identified and analyzed the origin, the main cause, and the secondary cause of the waste problem in relation to their own lifestyles. These understandings helped the villagers to realize the factual nature of many phenomena, including the social behaviors that caused the wastewater problem. All of these findings helped the villagers to arrange planned solutions, which were correct, appropriate and sustainable, in accord with the society.

- *The solution of the waste problem by the community*

Understanding the community's waste-related lifestyles was like a mirror reflecting the problems, so that the vested interests were able to know themselves, know the problem and identify the real problem by experiencing it first-hand. This was to focus on acceptance and led to agreement about the community's problem. The problem started from the villagers and the villagers' view of the problem led to acceptance and the feeling that dumping the waste was a problem and the villagers could act to solve this problem according to the needs of the community. Finally, will the people's feelings toward government work change their feeling of being the creators of what they must be responsible for.

The solution of the problem of waste in the community was based on the participation of the people who lived with the problem, and the researchers. They made use of everything, whether it was a way of thinking, a way of finding the facts, the analytical methods, the methods of mobilizing resources, or the way to manage the conflicts that led to the solutions. These were participatory solutions of the organization, formal and informal. The people came together to help find the solution guidelines with the researcher as coordinator and director of the group. The group process was used as the focal point for other associates' ideas. The interrelations of the group members enabled them to find suitable ways to build a percolation pond to hold the wastewater from the households, dig a pit to destroy the garbage, or make fertilizers from wet garbage. These things helped to create a learning process and a sense of responsibility for the community, which is the basis of sustainable development. It made the people feel that they were the creators of the project.

One remarkable point of the process to solve the waste problem was to use information taken from the study to create solution processes according to the source of origin, to create potential guidelines that suited roles and potentials, but did not obstruct the lifestyles of the vested interests. It was found from the evaluation that the organizations, both formal and informal, joined the project to work on the solution processes until they created the final agreeable solution methods. This caused a learning process and sense of responsibility for the river, which made the vested interests change to appropriate behaviors.

The solution processes were a strategy to help the community solve the problem by itself. The forms were in line with Buddhist philosophy and showed the importance of solving a problem using local intellect, social cost of the community and according to community lifestyles and culture. The community lifestyle placed importance on local intellect solving the waste problem. The social power was composed of the villagers, the community leaders, the volunteers, the government officers, the educators, and other associates who made efforts to create the changes.

The solution processes provided opportunities for everyone to present their opinions about the problem and the solutions, both supporting and contrasting, by being equally given the honor of being a community member. This was to reduce dependence on outsourcing and to place more importance on local intellect. This form of solution is the basis for a strong society, and was the social power that impelled the society to solve the problem.

A participatory form of waste management was the core of the sustainable solution. Harmonious solutions for the problem of waste among the riverbank community effected people's philosophy of daily life, increased the value of multilateral participation, and created harmony based on kinship, a traditional value of Thai society and the Tupperng community. Participation helped serve the people's psychological needs and implied self-help, resulting finally in self-reliance. The participatory solution promoted acceptance of new ideas, methods, and innovations. This enabled the people to express their own potential and innovative ways to solve the problem that best suited the community. The mentioned alternatives were in accord with the wishes of the community, so many people in the community accepted the final solution processes.

The brainstorming of the research team was regarded as a combination of the concepts and experiences of many associates who met with pleasant feelings towards each other. The interrelations of the group members permitted them to find the solutions that pleased everybody. Moreover, everybody had the opportunity to exchange their ideas and experiences with other people and unite to join the work in real practice. They also had a group to analyze the cause of the problem and the alternatives for solving the problem. They got to know themselves and others better, learned to be responsible for their own roles, learned how to solve the problem with reason according to the Buddhist principles of the Four Noble Truths, and feel compassionate with other people. This helped the group members to develop their attitudes, values, and behaviors in group interrelations, which led to solutions by group influence that could be applied to solving other problems in daily life.



The waste management methods that were created could be conducted effectively with the response from the associates and vested interests. Meanwhile, the local administration organization prepared to incorporate the solution processes into the sub-district development plan for environmental health, and to regulate the community orders. They accepted the forms together with the budget plan for the support and operation of the presented solution processes on the basis of legal factors. Moreover, the retail shops and bazaar vendors earnestly responded to garbage sorting. For the general populace, the evaluation showed garbage sorting and recycling was taking place. People no longer discarded products that were hard to destroy, because they had accepted the garbage problem and responded by taking action and adhering to the management process. Therefore, the solution processes were successful and effective, and aided in accomplishing a reduction in the amount of garbage dumped into the Yom River.

## **2) Sustainable Management of Waste**

The success of waste management in the Tupperng community included some factors that encouraged sustainability, including community participation, which was an important indicator in measuring sustainability, because it could help the community manage the garbage themselves. The researcher found that the important factors encouraging the process of sustainable participation in the community were as follows:

### ***The Family***

If any family member joined the research team, the others in the same family might inadvertently join the team, especially in the follow-up stage. This can be observed by the participation of the family members in many activities held by the research team. They were interested to observe and to listen. Sometimes, they would like to help arrange the area, or prepare refreshments. They followed up the group activity, and some helped by taking notes. The people in this community had very close family relationships, so they relayed knowledge, ideas, and values to each other. The advantage of a close family was that if one member grasped the problem of waste, the others would realize the same thing. On the other hand, if any family member objected to the idea, that family would participate less in the community's activities.

The family factor largely affected participation in solving the waste problem in the community. A family member who did not join the local research team could undermine the operation and present negative ideas through a member who was on the research team. Moreover, natural accumulation is caused by discussion to analyze the problem in the family and then it is expanded to the group of relatives and the community having the same ideas about waste management.

### *The Relatives*

Similar to the family factor, the relative factor initiated family meetings, which affected participation in solving the waste problem, by convincing the family to join the team. The relatives in the community were very close because they usually built their houses in the same area, so they constantly communicated with each other. If any of the relatives joined the team, the other relatives joined too. The conversations in the relative groups were about the research project. The information put forth in the relative groups made it fast and easy for all the villagers to learn of a meeting appointment and gather into their groups. The children members felt that they were part of the team and wanted to join the team if they followed the adults to the meeting or activities. This prepared a sense of participation for the next generation.

The relative factor was one factor that made people join the team by convincing them to be members, joining the meetings, telling news of the team, etc. This factor caused the management of waste to be sustainable.

### *Community Politics*

This is the most effective and important factor, because the political leaders who joined the research could see the problem occurring and make efforts to find a way to solve it for the people who elected them to perform this duty, including the leaders of the local administration organizations who were respected and trusted by the villagers. To be leaders they must have many followers and be trusted by the people; then, when community work took place, many people joined in because they believed in the abilities of the leaders. These local leaders were local people, so they knew the needs of the people very well, even the leaders of the new generations. The subdistrict

administration organization staff, who were recently elected, had to serve the community to protect their votes. However, the budget allocations for resolving environmental problems was meager, unlike those for a basic public utilities, so there was no assistance to cover it. It revealed that these local leaders had informal relationships with the villagers and they were mostly earnest, taking no personal benefit, because they sacrificed their personal time to work for the public. Moreover, solving the community's problems would earn them more votes in the next election.

### *The Use of Power*

In the past, the community development plan was usually developed by the sub-district administration organization and related local governmental organizations. In spite of that, the result of the developing the waste problem resolution plan was included in the district development plan. The power of decision-making had been decentralized to the members. The way that power in the community was used was another factor resulting in the sustainable solution. Decentralizing power and to making a decision for all members, interested people took part in deciding on problem solutions and opportunities for them to present their useful opinions for the community's work were provided. This factor guides the process to really serving the people's needs. Moreover, the work of the various groups in the community was done very informally, so it was easy for people to join in. Sometimes a meeting might occur in a community shop, where everybody could join in.

### *Facing Problems Together*

The villagers were all affected by the wastewater and waste in the river, to the point that they could not use the river water any longer. This made them feel sympathetic with each other and interested to see the benefits that their community should achieve. This may be called a process of co-learning for the people in the community. It showed the potential of convincing the community to fight the problem and the ability to develop the community's strength in continuously dealing with its waste.

### *Various Community Organizations*

There were many organizations, both formal and informal, e.g. the community leaders' group, the elderly people's group, the village public health volunteers, the savings group, the housewives' group, the demonstration groups for making composted fertilizers, and the group of funeral assistants. These groups were the sources of various benefits and interdependence within the community. The people followed and took the initiative in matters of mutual interest. There is also a link to cooperating in working to solve the waste problem, and the ability to gather the sustainable energy and commitment to eradicate the problem.

### *Awareness and Participation of Community Members*

The members of Tupperng community have long and continuously learned and joined community movements, for example to fight or bargain over community problems in the past, and this included the community research team to manage waste, which received participation from most of the people living in the community. The community participated in several activities according to the solution guidelines for the community's waste problem. It followed the rules, regulations and orders regulated by the committee. This behavior showed the intelligence of the people in the community, and expressed their realization of this problem and the importance of participating in waste management. Therefore, the community could manage the waste problem in their own community, demonstrating the sustainability of the solutions for the waste problem.

### *Sharing Responsibility*

In managing to reduce the amount of waste products, everybody cooperated in working according to their own duties. This was because everybody produced garbage. In the past, people thought that garbage management was the duty of the local administration organization as a public service that the government should confer on the people. This duty increased more and more, until it was beyond the capacity of the local government to perform the task efficiently, and with the budget limitations, waste collection did not cover the overall area. Moreover, with the lack of modern disposal technology, the garbage became a major problem.

Everyone shared responsibility in managing the waste by making a waste landfill, building a percolation pond, waste separation, and not throwing garbage into the river. This was because they realized that together they caused the problem so it was only right to jointly accept responsibility for the solution and prevention. This was the philosophy of the Tupperng people.

If the meaning of “cooperation” is the process of many people working together using power or ideas, there has been cooperation in the Tupperng community for a very long time. This cooperation was evident among the villagers in community festivals and religious traditions. It was horizontal cooperation, where everybody was willing to join in because they had the same objective, to have a better lifestyle without being forced by others. This cooperation was based on equality, because it happened in the community and was not associated with outsiders. Therefore, the people who joined in the cooperation lived in the same community or the same area.

Considering the bilateral membership of the Tupperng community, they had many associates as components of the cooperative process. The community was used as the basis, primarily to reinforce the strength of the community, which was an important strategy to create participation in waste-matter management for the whole society. The waste management activities in the community were, therefore, in accord with the community’s context and occurred primarily to serve the community’s needs.

The research solved the problem of waste in Tupperng community, and was implemented through community cooperation and the leaders who wanted to solve the people’s problem. This can therefore be regarded as a successful project. It was evident that the vested interests paid attention to the research process and the results were accepted by the research group and the people in general. Therefore, it can be judged that the Tupperng community was able sustain ably to manage the garbage problem themselves.

#### 4.12.5 Project Results and Impact on the Community

It is apparent that the participatory research project process allowed the vested interests to participate in the research, and produced excellent, tangible benefits, as follows.

1. Development of the potential of the community organization. The project advocated and created a leadership situation in the community, separate from the natural leaders, who tended to manage the community's waste problem alone, and took the initiative to create what the community wanted, so that the people could have a better standard of living.
2. Learning and exchange experiences among the people in the community were accomplished. The people acquired new knowledge and exchanged the benefits of their local intellect with advanced technology, which was also an exchange of operational experience.
3. A network was set up connecting the government and the people, the communities, the organizations, the local people, and the "bilateral associates" in the work to develop waste management. An obvious example is the working waste management network at the community level, which was composed of the community leader, public health volunteers, the housewives' group, and officers from the public and private sectors.
4. The people in the community could perform some activities that were of public benefit together, and understand the community's problem and investigate solutions. The performance of activities together constituted resource management. The supports of physical power, financial power, ideas and capital were gathered together for use in community activities.
5. The people changed their attitudes and created a sense of villagers managing their own sustainable development, to take the initiative to solve the waste problem and develop the community with their own intellect.

6. They set up plans to solve the waste matter problem and included it in the sub-district development plan, allocating the budget from local and government organizations to support the community operations and gather the capital and other resources to reinforce the community.
7. The research project caused the issue of waste management to be one for every household, while normally government operations are unable cover the population concerned thoroughly but limit the benefits to people in only some groups. The villagers' participation helped to enlarge the working network and cover more people. It also helped the community to be supported by the general public, because all of the solution processes derived from the ideas of the people in same community.
8. The research project helped the villagers to work efficiently. In the participatory process of the community research--starting from the study of lifestyles, and continuing through seeking solutions to managing waste, the processes, the follow-up, and the evaluation. They needed coordination with resources and activities, and the effort to work, so that the repetition of work was reduced and the responsibilities were shared among the group of vested interests.
9. The work was done effectively because together they set priorities in the research activities, set the targets, objectives, the plans and the strategies with community effort, local intellect, skills, and resources to the best benefit.
10. The research project encouraged equity and community participation, so all members were equal in sharing the responsibilities and the strength to serve the community's needs and find better supportive methods to solve the community's problem.

11. The research project encouraged the villagers to feel self-reliant and the participation encouraged self-awareness and confidence that the community could solve the problem properly by themselves. The lecturers' experiences helped increase the community's potential in controlling the factors affecting their lives, and provided training until they could rely on themselves in solving problems alone, after the researchers had left.
12. The community understands itself, knows about human resources, understands the structure of the social relations in the village, knows the background, culture, traditions, values and beliefs of the local people, knows the lifestyles, rituals, and communication of the people in the community, including factors favoring health development, so that community participation as a partnership can flow from the "know him, know me" strategy.
13. From the research study, a "public society" was created, i.e., when the people in society with civic consciousness come together as one in some activity with love and care for each other under a management system to gain knowledge together. A public society can produce power exceeding that of the public and private sectors. This type of participation is a civic organization that can be either formal or informal and can create a social structure with horizontal relationships, which can create stable, solid, and sustainable development if smoothly coordinated with the structure in a vertical relationship.

It can be concluded that the community achieved sustainable management of the waste problem. Community participation was at the heart of solving the problem. Finding the solution to the problem of wastewater and garbage can serve as a basis for solving every other community problem. Therefore, community participation is not only important, it is essential in the work of all sectors.