

# PARTICIPATORY MANAGEMENT OF WASTE DISPOSAL

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**Abstract.** The general objective of this study was to develop a sustainable waste disposal management model in Yom riverside communities by creating a sense of ownership in the project among the villagers and encourage the community to identify problems based on their socio-cultural background. The participatory approach was applied in developing a continual learning process between the researcher and stakeholders. The Tub Phueng community of Si Samrong, Sukhothai Province was selected as the location for this study. From the population of 240 households in the area, 40 stakeholders were selected to be on the research team. The team found that the waste in this community was comprised of 4 categories: 1. Occupation: discarded insecticide containers used for farming activities; 2. Consumption: plastic bags and wrappers from pre-packed foods; 3. Traditional activities: after holding ceremonies and festivities, the waste was dumped in the river; and 4. Environmental hygiene: waste water from washing, bathing, toileting, cooking and cleaning was directly drained into the Yom River. The sustainable waste disposal model developed to manage these problems included building simple waste-water treatment wells, digging garbage holes, prosecuting people who throw garbage into the river, withdrawing privileges from people who throw garbage into the river, and establishing a garbage center. Most of the villagers were satisfied with the proposed model, looked forward to the expected positive changes, and thought this kind of solution would be easy to put into practice.

## INTRODUCTION

The Yom River in Sukhothai Province contains mostly organic wastes contributed by domestic sewage. The river is used not only for purposes of transportation, recreation, and bathing, but is also used as an open sewer for households. Presently, bathing and washing are still practiced by local people close to the Yom River. Individuals who use the water for daily consumption are at a great risk for health problems.

The practice of throwing waste into the river causes breeding of microorganisms and can be an important vehicle for transmitting chemical toxins, leading to water-borne diseases, such as cholera and typhoid. Chemicals and pesticides may also contaminate the water supply. It is estimated that about 10 million people die every year due to typhoid, cholera and dysentery worldwide (Sastry, 1995).

Water-washed diseases are those in which the pathogen spends an essential part of its life in the water or depends on aquatic organisms for the completion of its life cycle. Water-washed diseases of the Yom River are due to the poor hygienic habits and sanitation of the local people. The polluted water of the Yom River can not be used for washing and bathing. The contaminated water affects the aquatic ecosystem, and the food chain, which retains poisonous substances.

The Yom River problem has been taken seriously by the Ministry of Public Health. Various governmental agencies have launched different projects to improve the water quality of Thailand. (Sukhothai Provincial Public Health Office, 2000). Unfortunately, a water quality survey shows that the problem still remains. A major factor in the project's failure was the lack of a sense of involvement and acceptance by the local people. Most of the villagers did not understand the real situation and the impact of the problem. As a result, they tended to view the wastewater problem as a government agency problem, not theirs. In addition, the government established all the strategies, not taking into account the local perspective. This resulted in

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an unsustainable project, as people tended to ignore the project.

Our research focused on formulating a model of sustainable waste water management by developing community participation, with problem-solving strategies originating from a community perspective. Communities should be given the opportunity to develop problem-solving strategies without pressure. This is an important beginning for sustainable problem-solving strategies.

## MATERIALS AND METHODS

This study applied a participatory approach to problem solving. Forums with villagers were conducted during each phase in order to promote the exchange of knowledge and opinions between the villagers and the researcher, leading to a systematic conclusion. The participatory and community participation approaches enabled the villagers to learn by themselves and improved their capability in solving community problems based on their own perspectives, habits, needs, and lifestyles (Denzin and Lincon, 1994).

The waste materials disposal process of communities living along the bank of the Yom River were thoroughly examined through sociological theories to discover lifestyle factors which were related to waste disposal management. This study brought the villagers together with the researcher to discover the cause of problems by themselves and by using systematic learning methods. New bodies of knowledge emerged from the inspection of patterns and behaviors of communities regarding waste disposal, and then used to improve the waste disposal problem.

This study consisted of three phases, which took place continually. It started with an investigation of the riverside people's focus on waste disposal by applying Buddhist methods of Four Noble Truths (Ariya-sacca) and Right Understanding (Samma-ditthi) to investigate the cause of the problems. These methods enabled the villagers and the researcher to understand the cause of waste relating to their lifestyle and allowed them to analyze the origin of the problem. This allowed them to find solutions base

on local wisdom, brainstorming, and reliable methods. This study linked the cause of problems, which had been identified earlier in the study, to appropriate solutions which fit the lifestyles of the people and the needs of the community, mainly based on 'the Samliam Kayern Pookuo' approach. After obtaining the solution, the villagers developed a process for participatory evaluation with the assistance of the researcher. The evaluation assessed whether the solution met the needs of the community. The consequences were perceptible and beneficial.

The researcher conducted an assessment of the process to determine if it served the purpose efficiently. The results in each phase were evaluated to determine if they answered the questions and solved the waste disposal problem. The researcher chose Tub Phueng community in Si Samrong, Sukhothai Province as the location of the study, because that community lives by the Yom River and is representation of the problem. The quality of the water in the Yom River is below standards. The people were eager to participate in the study. Two hundred forty houses were chosen for this study. Forty of them(stakeholders) were selected for the research team. Data were collected through observation, focus groups, group discussions, note-taking and tape-recording. The data analysis was done by indexing, typology and taxonomy comparisons, and interpretation.

## RESULTS

### Occupation

The Tup Phueng people regularly used chemicals to kill insects. These farmers usually threw the used insecticide containers, such as cans or bags, into the Yom River. This garbage is dangerous. They also cleaned these containers in the Yom River. Both sides of the Yom River grow tobacco and vegetables, which creates waste water. The waste from cooking, composed of nitrogen and phosphorus, drains into the Yom River when it rains or after washing. Wastewater from farms contaminated with chemicals and other insecticides, such as herbicides, also drains into the river.

The utilization of new technology on farms

generates garbage that is difficult to eliminate, such as lube oil bottles, grease bottles, and old transmission belts. It also produces toxic waste, such as electric tubes, batteries, brake fluid, and cleaning agent containers. People did not separate these wastes or dispose of them properly. Farming trucks, each evening after being used were cleansed of dirt, mud and oil at the riverbank. The water, mixed with the mud and oil, drained directly into the Yom River. Used oil from farming trucks was washed by the rain into the Yom River.

### Consumption

The changes in economy, society, and culture in this community have led to a change in the consumption habits of the people, from relying on the ecology of the community to relying on the market system. Relying on food from the market system has created waste packaging materials. Everything bought in the market is wrapped in packaging materials, which are not reusable. "There are a lot of these plastic bags, we get them every day. Tomorrow there will be more. We keep a lot of them, but the dirty ones we throw away..." (Thong Kum conversation group 2546). These materials became a waste problem. Plastic bags, vegetables, and fruits were disposed of in the Yom River, which the people thought of as easy, free waste disposal site.

### Traditions

For various ceremonies, such as weddings, earning merits, or becoming a monk, people prepare food to give to the monks and the people who came for the ceremony. This tradition builds relationships between people in the community. After the ceremony, the solid wastes were dumped in the river. Contaminates from toilets also drained into the river.

Row boat competitions, and other community entertainments create garbage. After competition or a night of entertainment in the temple, piles of garbage are spread all over the area. Some of this was swept into the river or left on the bank where there is a lot of grass.

On a monk's day, a lot of people give food to the monks in their monk bowls. After the monks have eaten and given blessings to the

people, usually the people hurry back home. This situation creates a lot of leftover food. Even with bringing some to feed the dogs around the temple, there was still a lot of leftover food remaining, which was left to spoil. Some people threw this spoiled food into the river without knowing that it contaminated the river.

### Environmental hygiene

There are piles of garbage on both sides of the river. Comments included, "The garbage? It's a problem...at the foot of the bridge, at the temple entrance, at the front of the temple, and at the temple hall..." (Somnuk). "Over there beyond Berm's house, you see, they throw it here, on the riverbank, or in the water..." (Samarn). "At the school, they throw it behind the school." "They only burn it once in a while, the janitor always pushes it into the river..." (Subin).

Tup Phueng 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, which were black and had a bad smell. Chickens come and scrape these pits. Nobody manages these pits. They just let them dry. Some dig long channels and let it flow to the river. It was a source for mosquitos, which was also a community problem.

### Waste water solution model

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

**Long-term plans.** 1. Building sanitation toilets on the banks of the river; 2. Building simple wastewater treatment wells; 3. Providing buckets for toilets; 4. Building the earthen dykes to prevent waste water from draining into the river.

### Garbage solution model

**Short-term plans.** 1. Building garbage holes; 2. Sorting the garbage; 3. Feeding animals with the remnants; 4. Providing dustbins for all house-

holds; 5. Recycling garbage; 6. Reusing garbage; 7. Setting up signs not to throw garbage onto the banks of the river; 9. Producing fuel from dry garbage; 10. Burying wet garbage on the farms or in the gardens; 11. Condemning people who throw garbage into the river; 12. Canceling help for people who throw garbage into the river; 13. Providing patrols to look out for throwing garbage in the river; 14. Using biodegradable materials.

**Long-term plans.** 1. the Sub-District Administrative Organization should provide facilities for collecting garbage from households; 2. Establishing a garbage center; 3. Using wet garbage to produce biological fertilizer; 4. Providing big dustbins at various points on the banks of the river; 5. Educating the youth; 6. The Sub-District Administrative Organization should provide the budget to buy a garbage truck; 7. Canceling agriculture along the banks of the river.

#### Evaluation

The evaluation team questioned the villagers on whether they felt satisfied with the proposed solutions. Most of them felt very satisfied and expected to see positive changes. They felt this kind of solution would be easy 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 their community. They realized that everyone in the community was responsible for the problem of waste and trash in the river. When the government failed to solve the problem, they joined together to solve it themselves. The residents felt satisfied with their own way of solving the problem without force.

#### DISCUSSION

The solution to the waste problem was to involve the residents in the community. Helping the person with the problem "Think" about it and "Do" something about it resulted in a more sus-

tainable solution.

The ability of the people to stay with the problem was strengthened by learning the cause of the problem, analyzing it systematically, and seeking solutions. This was carried out by the resident analysis team. The joint problem analysis strengthened the problem solving. This resulted in an understanding of the problem and led to a proper solution.

The ability to gather the community to solve a problem, such as waste management, is difficult and complex. An individual, organization, or official authority cannot solve the problem alone. Very often the solving process creates new problems that overlap the existing one. The community involvement was the factor that helped in solving these difficulties. Previous efforts to solve this problem did not mobilize the community. The problem solving process used in this research uses the community to solve the problem.

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