

First Report
The pilot project for Maximizes Recycling and Minimizes Waste
at Phibulsongkram and Suan Klang Muang 3 Village,
Nonthaburi, Thailand

Background of the project

Nonthaburi municipality is the same as cities all around the world which are grappling with the waste problem. We are in crisis of our own making as waste piles up, no wastewater treatment, spreads and contaminates, treating immediate and long term liabilities for future generations. Nowadays, Nonthaburi produces solid waste 300 tons/day, solid waste is being generated in an increasing tempo and is becoming more and more difficult to dispose regularly. The capacities of sanitary landfills are almost exhausted and new dump sites are difficult to establish because of comprehensive legislation is agreed over time for the sake of a sustainable of awareness about related health threats chemical pollution of groundwater, and the unwise and wasteful use of irrecoverable resource. Open dumping accompanied by burning is the most prevalent form of waste disposal in Nonthaburi. The potential to reuse waste materials has yet to be explored, only 3-5% of waste was separated for recycling.

In early 2001, Nonthaburi municipality requested the assistance of the IGES, Japan and the ESCAP, UN in the developing solid waste management in Nonthaburi municipality. Therefore, the ESCAP supported the budget of 5,000 US dollars for the pilot project: Maximizes Recycling and Minimizes Waste at Phibulsongkram and Suan Klang Muang 3 Village, Nonthaburi, Thailand.

The objectives of this project are as follows:

- To maximize recycling 20% and minimize waste 30% pilot area.
- To study appropriate model handling and implement in community area.
- Promotion public participation and local coordination.
- Advocate capacity building.
- Developed solid waste management in Nonthaburi municipality.
- The duration of the project is one year: started from December 2001 to November 2002.

Project location is at Phibulsongkram and Susan Klang Muang 3 Village in Nonthaburi municipality, Thailand. Normally, Nonthaburi municipality provides garbage truck collection to each village twice a week. The amount of solid waste from Phibulsongkram village is 1,000 kgs/day and 200 kg/day from Suan Klang Muang 3 village. These two villages are in the central part of the city and most of the people are in the middle class and live for residential area. They are security village with good environmental themselves. The population of two village is 1,280 persons.

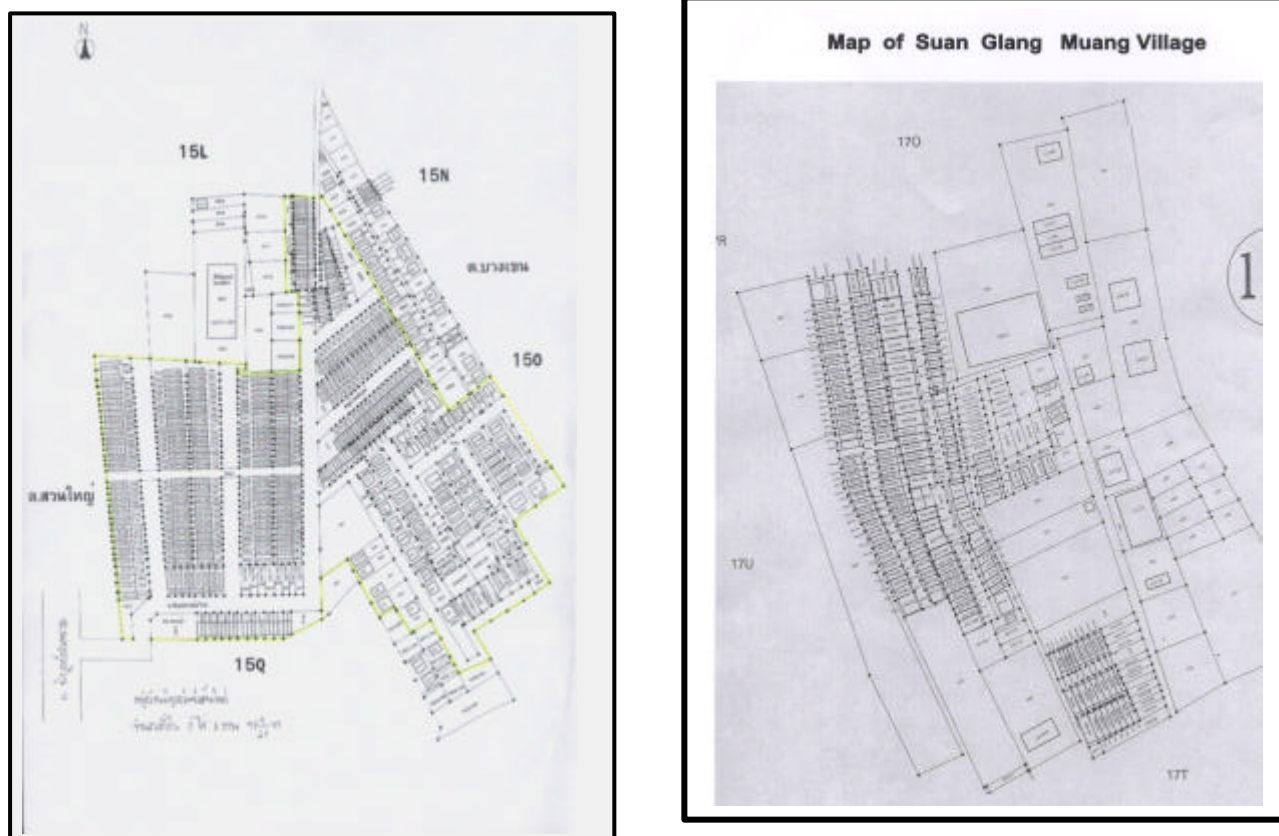


Fig. 1 The map of Phibulsongkram and Suan Klang Muang 3 Village

Implementation

The project started in January 2002 by the methodology and step of implementation as planning in the project.

1. First activity: Setting team work of 10 staffs for implementation the project by surveyed the data of Phibulsongkram and Suan Klang Muang 3 village about the household, populations, and amount of solid waste. (Table 1)

Village	Households	Populations	Solid waste Kgs/day
Phibulsongkram	539	930	1,008
Suan Klang Muang 3	120	350	214
Total	659	1280	1,222

Table.1 Households, Populations and Solid waste of two villages.

2. Community participation: The meetings were held in both villages to advocated people about the problem and the situation of solid waste management, exchanging the ideas and select the appropriate model to reduce solid waste in their villages with so-operation and the suggestion from the community committees and the participations. The project proceeded with these approaches:

- Providing the meeting with the villagers to let them know about the purpose of the project.
- Providing refuse truck twice a week for garbage and recycling truck one a week for recycling material.
- Distributed mass media to every household about the information of recycling and how to reduce solid waste.
- Providing plastic bag for recycling material and distributed recycling bin for every household.

3. Waste Collection: Nonthaburi municipality provides garbage truck collect garbage twice a week at exactly day and recycling truck once a week. Every trucks must be weighted and recorded the amount of garbage and recycling materials.

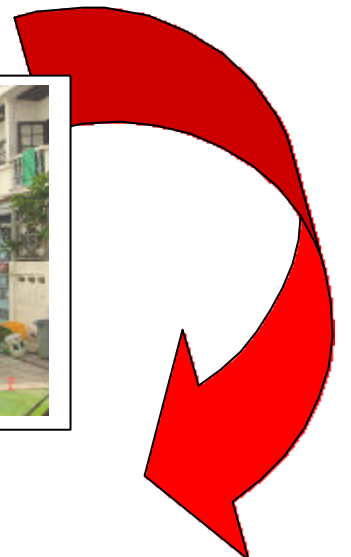


Fig. 5 Garbage collection twice a week.

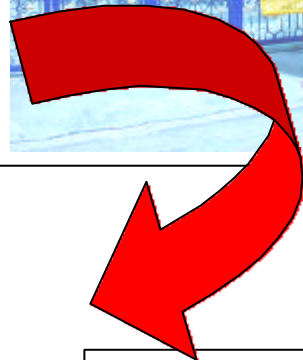


Fig. 6 The collection of recycling material once a week.

4. Produced mass media: Producing brochures about the information of how to reduced waste to every households and setting one public commute board for each village. Repeating, distributing the brochures to every households, follow up and left monitorial note in some households.



Fig. 7 The type of mass media distributed to every households.



Fig. 8 Public relations board at two village

Budgeting

- Recycling bin 660 bins	=	\$ 2200 US
- Two Public relation boards	=	\$ 460 US
- Brochures 2 model	=	\$ 2026 US
- Community meeting 2 times	=	\$ 314 US
Total	=	\$ 5,000 US

Data Analysis

Before starting the project the quantity of solid waste at Phibulsongkram village is 1,008 kgs/day and Suan Klang Muang 3 is 214 kgs/day (Table 1). The project has been implemented in November 2001, the data collection of solid waste must be done the first. The quantity of solid waste in Phibulsongkram village is 1,008 kgs./day and Suan Klang Muang 3 is 214 kgs./day and the villager separated recycling material by themselves and the weight of recycle materials in Phibulaongkram village is 54.5 kgs/day (5.4%) and increase to 138 kgs/day (20.34%) in June and Suan Klang Muang 3 is 11.2 kgs./day (5.21%) and increase to 36.2 kgs./day (24%) in June. (Table 2-3)

Table 2 The weight of solid waste at Phibulsongkram Village

Month	Solid waste kgs./day	Recycling material kgs./day	Recycling rate (%)	Note
November, 01	1008	54.5	5.4	Preparation and collection data
December, 01	996	50.1	5.2	
January, 02	819	74	9.04	
February, 02	776	78.4	10.1	
March, 02	926	76.2	8.23	
April, 02	897	105	11.74	
May, 02	968	147	15.18	
June, 02	680	138	20.34	

Table 3 The weight of solid waste at Suan Klang Muang 3 Village

Month	Solid waste kgs./day	Recycling material kgs./day	Recycling rate (%)	Note
November, 01	214	11.2	5.21	Preparation and collection data
December, 01	215	10.1	4.8	
January, 02	139	16.3	9.75	
February, 02	173	20.2	11.64	
March, 02	204	23.5	9.11	
April, 02	150	20.2	13.42	
May, 02	115	21.7	18.67	
June, 02	151	36.2	24	

Composition of recycling material are paper, glass, plastic, metal, and other. 5% of recycling materials can be recycled and 25% is waste. The income of Phibulsongkram village increases from 344 bath/month to 993 bath/month. The income of Suan Klang Muang 3 increases from 223 bath/month to 637 bath/month. (Table 4-5)

Table 4 Composition of recycling materials at Phibulsongkram village

Month	Composition of recycling material (kgs)					Total (kgs.)	Income (Bath)
	Paper	Glass	Plastic	Metal	Other		
November, 01	365	373	230	92	575	1635	344
December, 01	324	361	199	137	533	1554	438
January, 02	427	604	485	154	517	2222	358
February, 02	381	664	473	141	571	2196	428
March, 02	363	726	546	181	545	2362	788
April, 02	475	921	713	236	786	3160	866
May, 02	695	1394	1043	346	1080	4558	988
June, 02	866	1294	779	192	1016	4147	993

Table 5 Composition of recycling material Suan Klang Muang 3 Village

Month	Composition of recycling material (kgs)					Total (kgs.)	Income (Bath)
	Paper	Glass	Plastic	Metal	Other		
November, 01	58	94	58	22	103	335	223
December, 01	59	88	56	15	93	311	260
January, 02	91	147	110	18	139	507	390
February, 02	91	160	123	24	166	565	420
March, 02	109	218	151	32	219	729	521
April, 02	95	190	125	36	171	607	577
May, 02	160	164	125	41	182	672	584
June, 02	189	335	252	59	251	1086	637

The quantity of solid waste of two village is decrease from 1.222 kgs./day in November to 831 kgs./day in June. Separation materials increased from 5.3% to 22.1% in average. Therefore, the solid waste/capital/day decrease from 0.95 kgs./day to 0.65 kgs./day. (Table 6)

Table 6 Weight of solid waste on Phibulsongkram and Suan Klang Muang 3 Village.

Village	Month	Weight of Solid Waste (kgs./day)							
		Nov, 01	Dec, 01	Jan, 02	Feb, 02	Mar, 02	Apr, 02	May, 02	June, 02
Phibulsongkram		1008	996	819	776	962	897	968	680
Suan Klang Muang 3		214	215	139	173	204	150	115	151
Total		1222	1211	958	949	1166	1047	1083	831
Solid waste/capita		0.95	0.94	0.75	0.74	0.91	0.82	0.84	0.65

Table 7 Weight of recycling material on Phibulsongkram and Suan Klang Muang 3 Village.

Village	Month	Weight of Solid Waste (kgs./day)							
		Nov, 01	Dec, 01	Jan, 02	Feb, 02	Mar, 02	Apr, 02	May, 02	June, 02
Phibulsongkram		54.5	50.1	74	78.4	76.2	105	147	138
Suan Klang Muang 3		11.2	10.1	16.3	20.2	23.5	20.2	21.7	36.2
Total		65.7	60.2	90.3	98.6	99.7	125.2	168.7	174.2
Recycling rate Avg. (%)		5.3	5.0	9.4	10.9	8.7	12.6	16.9	22.1

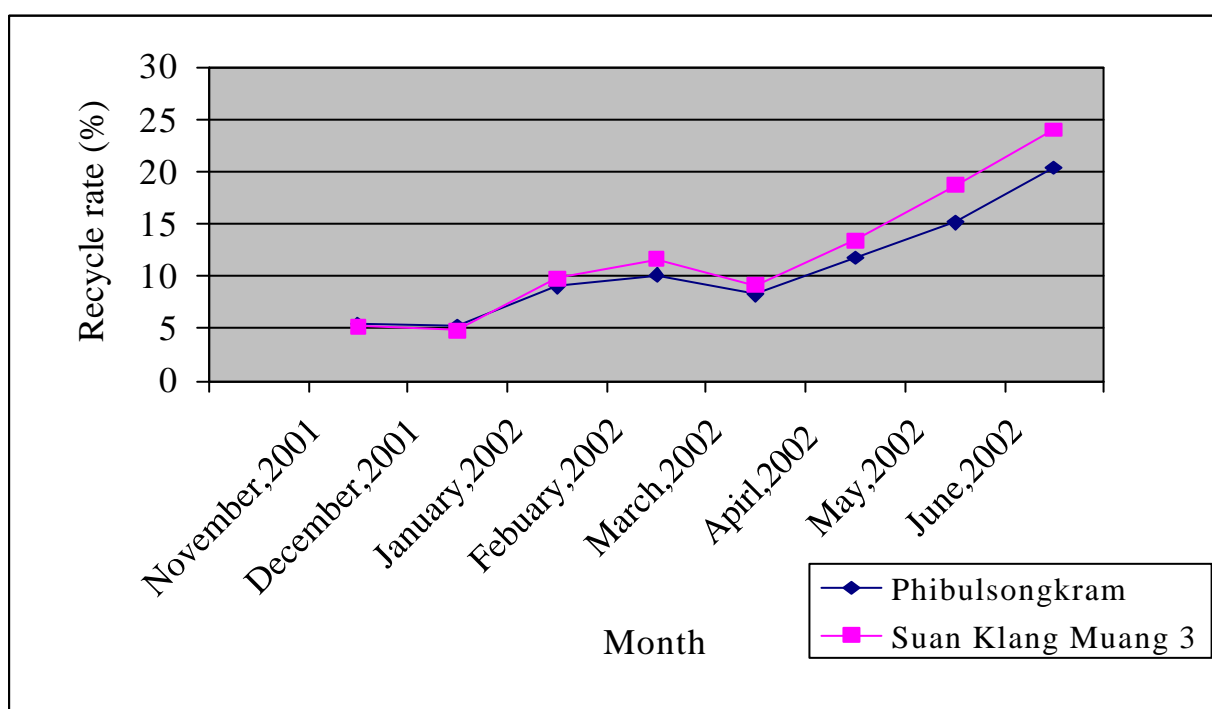


Fig.9 The comparison of recycle rate of Phibulsongkram and Suan Klang Muang 3

The results from implementation at Suan Klang Muang 3 village is 4% better than Phibulsongkram village. In the beginning project, the recycle rate of Phibulsongkram village is 5.4% and Suan Klang Muang 3 village is 5.21%, when the project has been implement the recycle rate increased and solid waste has been reduced. On June, 2002 the recycle rate of Phibulsongkram village is 20.34% and Suan Klang Muang 3 village is 24%. (Fig.9)

Conclusion: Output and Outcome

The result of the project is satisfaction in the first evaluation after 6 months. The trend of increasing recycling materials is high more than 20%. Before starting the project, Phibulsongkram and Suan Klang Muang 3 produced solid waste 1222 kgs./day there were recycling material 65.7 kgs./day. The model of solid waste separation in the pilot project was considered by committees and villagers including the public relation of the project by committees and staff of Nonthaburi municipality. The villagers had joint in the workshop of how to reduce solid waste from households. The recycling bins and plastic bags were distributed to every household in Phibulsongkram and Suan Klang Muang 3 village. The villager cooperated in the way to reduce solid waste by separation the recycling material before they put them in the bin. The garbage truck collected garbage twice a week (Tuesday and Friday) and the recycle truck collected in the same day.

The problem of solid waste management in the pilot project had been solved by villagers themselves. Besides that, they had encourage income from recycling material 1630 baths/month and they can improve environment and quality of life.

The output and the outcome are as follows:

- The recycling materials are 22% in average.
- The villagers change their behavior in separation of recycling material.
- Better cooperation between municipality and the villagers.
- To create awareness of the importance of environmental conservation.

Constraints

Lack of cooperation from a few households therefore public relations and monitoring is very important to simulate the villagers cooperate with this project.
