

*Asian Journal on
Energy and Environment*

ISSN 1513-4121

Available online at www.ajee.info

Case Study

Survey on Participation of Nongtha Tai Villagers (Lao PDR) in Household Waste Management

Souphab Khouangvichit.^{1*}, Warinthorn Songkasiri², Catalin Stefan³, Terry Commins⁴ and Visalsok Touch⁵

1. Faculty of Environmental Science and Development, National University of Laos, P.O. Box 7322, Vientiane, Lao PDR

2. National Center for Genetic Engineering & Biotechnology, Thailand Science Park, Klong Luang, Pathumthani, Thailand

3. Institute of Waste Management & Contaminated Site Treatment, Technical University of Dresden, Pratzschwitzer Str. 15, 01796 Pirna, Germany

4. King Mongkut's University of Technology Thonburi, Pracha Uthit Road, Ratburana, Bangkok 10140, Thailand

5. University of Battambang, National Road 5, Preaek Preah Sdach Commune, Battambang, Cambodia

*Author to whom correspondence should be addressed, email: souphabk@yahoo.com

This paper was developed as a case study under the EC-Asia Link Project INVENT.

Abstract. A survey involving personal interviews of 137 households was undertaken at Nongtha Tai Village in Vientiane to obtain a picture of waste management practices at the village/urban community level. The survey determined waste volume and usage, as well as recording villager's attitudes towards waste.

Results from the survey provide a clearer picture of problems occurring at the village level and the role of formal and informal groups. The paper concludes with suggestions for better waste management from the villagers themselves, as well as a number of recommendations for improvement.

Keywords: community, survey, waste disposal

Introduction

Nongtha Tai is a village in Chantabouly District of Vientiane Capital. The village is bordered on one side by a river and on the other by a main road. Depending on the level of the river, it also has a lake. While it falls within an urban area, there is ample land and water available for the improper disposal of household waste. Figure 1 provides an example of waste dumped on free land.



Figure 1. Waste disposed of on common land within the community.

In 2002, it was estimated that Vientiane generates about 230 tons of waste each day [1]. Under a campaign initiated by the government health organization called “Vientiane Sa-art”, or, Keep Vientiane Clean, households are encouraged to sign an agreement covering waste disposal. Nongtha Tai was selected for this study on the basis of almost 50% of households having signed such agreements. Villagers signing such agreements are in turn required to pay a standard fee for collection services.

Methodology

A total of 137 households were selected for interview and observations and interviews were conducted by a research team from the National University of Laos over a period of 25 days. Of the total households surveyed, 70 had signed an agreement, while 67 had not. 70 of the selected households were located next to the main road, thus having easier access for collection. Of these, 48 had signed agreements, while 22 had not. A further 67 households were located along smaller lanes within the village, thus making access for collection more difficult. Of these, 20 had signed agreements, while 47 had not.

According to a seminar on the environment of Vientiane Capital, held in February 1999, [2] waste is categorized into 3 major groups:

- Solid waste (rubbish, glass, metal, wood waste).
- Liquid waste (sewage, industrial wastewater, storm water).
- Gas waste (vehicle exhaust, smoke from factories, incineration).

The aim of the study was to determine waste composition in a typical village, the villager's methods of disposal and their level of awareness of environmental issues related to solid waste disposal and treatment.

Current Situation

A previous study [3] on solid waste within Vientiane Capital revealed that the bulk is comprised of wood and leaves. This is no doubt due to there being a lot of trees remaining in the city area and the traditional practice of having fruit trees around the house. Other studies in the inner urban area suggested the organic component was highest at 38% [4]. Table 1 shows the composition of waste collected in Vientiane Capital.

Of the total collected waste, it was estimated that around 30% can be directly sold, mainly for recycling or reuse. Some, such as paper and glass for example, is exported to Thailand for further recycling. It was also estimated that more than 40% of this waste could be classified as organic, including vegetable scraps and other food wastes, as well as un-waxed paper. This has potential for commercial recycling, such as animal feed, compost or biogas.

Table 1. Waste composition in Vientiane Capital.

Type of Waste	%
Garbage (kitchen waste)	15.2
Paper	3.8
Plastic	8.9
Glass & ceramic	7.5
Metal	5.1
Textile	2.5
Rubber & leather	2.5
Wood & leaves	34.2
Other (construction waste, etc.)	20.3

Source: Sayamung, 2003

Following separation of the recyclable or reusable components, the remaining waste, including hazardous components, is disposed to a landfill.

A number of laws have been enacted with specific reference to pollution and solid waste disposal. These are:

- EPL Charter 3, Section 3, Article 22, which covers responsibility on controlling pollution (2001). In Lao.
- EPL Article 23, Paragraphs 7-8, on pollution control and prevention policies (2001). In Lao.
- National Assembly, Article 46, covers penalties for pollution and illegal disposal (1999). In Lao.

Results

According to information provided by the households, waste is generated on a daily basis as shown in Table 2. An example of this waste is also shown in Figure 2 below.

Table 2. Daily waste generated.

Daily waste generation	No. of households	%
1—50g	2	1
50—100g	20	15
100—500g	58	43
> 500g	57	41
TOTAL	137	100

These figures conform with data collected during previous studies [5] [6], which found the daily average to be 0.3-0.5kg. It can be concluded from this table that the village generates about 500kg of waste per day.



Figure 2. An example of waste in a household backyard within the village.

The 67 households that had not yet signed any agreement, and therefore did not avail themselves of the regular collection system, were examined in greater detail to determine their views on waste disposal. Table 3 shows the responses from this group.

Table 3. Views of households not covered by agreement.

Households	Number	%
No access by truck	2	1
Waste burnt at home	50	75
Would like to have collection	9	13
Other	6	9
TOTAL	67	100

It is clear from this table that incineration by the householder is the most popular form of disposal for villagers not covered by any collection agreement. The bulk of this waste is most likely to be wood and leaves swept up in the compound (Table 1).

While surveying the 137 households, observations were also made as to the amount of visible waste in the immediate area surrounding the house. The results are shown in Table 4 and indicate that cleanliness is of a reasonably high standard.

Table 4. Waste in the household environs.

Waste in the household compound	No. of households	%
Considerable	14	10
Small amount	35	26
Very small amount	37	27
None	51	37
TOTAL	137	100

On the basis of these findings, the respondents were also surveyed as to how they normally dispose of their household waste. The results indicate that waste bins are the preferred method of disposal, as shown in Table 5. This also suggests that the provision of bins is critical to encouraging correct disposal. Figure 3 provides an example of waste simply dumped on the bordering fence between two households in the community.

Table 5. Waste management within the house.

Preferred or Usual Method of Disposal	No. of households	%
Burn	44	32.1
Bury	1	0.8
Throw in backyard	7	5.1
Throw in nearby lake	1	0.8
Place in a bin	73	53.2
Other	11	8.0
TOTAL	137	100



Figure 3. Waste dumped on the fence between two households.

The villagers were also asked who had primary responsibility for waste disposal within the family unit. It can be concluded that no particular gender has responsibility, as the task usually does not devolve to one particular person, although women seem to play a larger role than men. The results of this survey are shown in Figure 6. These results vary from the findings of the URI study [5], which concluded that men play the primary role in waste management at the household level.

Family Member	No. of Households	%
Husband	12	9
Wife	37	27
Anyone convenient in the household, including children	88	64
TOTAL	137	100

Figure 6. Participation of family members in waste disposal.

Views were also sought from each household as to what they felt were the most appropriate means to reduce household waste in the village. These were eventually grouped into 4 major suggestions, as shown in Table 7. There was a reasonably even spread of support for all 4 suggestions, with none being particularly favoured as a solution.

Table 7. Views on procedures to improve waste management.

Procedure	Significantly Agree	%	Agree	%	Partially Agree	%	Disagree	%
Provide waste education	71	25.8	65	28	4	17.5	0	0
Law enforcement	69	25.1	50	22	9	39.1	11	69
Sign agreement	66	24.0	57	25	9	39.1	5	31
Extend waste collection route	69	25.1	59	26	1	4.3	0	0
TOTAL	275	100	231	100	23	100	16	100

Although not conclusive, it can be assumed from this data that the enforcement of law is the least favoured solution.

More general comments offered by the villagers indicated that they felt the cost of waste collection was too high when compared to other villages. They also felt littering in any water sources should be prohibited and offenders identified and fined. It was also suggested that the size of the waste collection trucks should be matched to the size of the streets and lanes, to allow for easier access. Finally, they also suggested that the levy on waste collection should be based on the volume of waste generated.

Views were also sought as to why villagers felt waste exists in their community. A summary of these views is given below, not in any particular order:

- Lack of knowledge on waste and disposal issues generally.
- Lack of waste management at the household level.
- Low level of education and awareness.
- Relatively low number of waste agreements signed.
- Inefficient collection.
- Carelessness, lack of interest and responsibility.
- Avoidance of the collection charge, often considered to be high.
- No full participation in waste management campaigns.
- Rules and regulations not effectively enforced.
- Illegal dumping of waste in public areas during the night time.

Solutions offered by the villagers to solve their problems included raising awareness and organizing occasional clean-up activities. Lack of awareness was also cited as being a major consideration by Sengtianthr [7]. They also were of the view that a proper waste management system should be in place, including rules to control and limit waste.

Greater responsibility by collectors at the site should be encouraged to avoid spillage and collection contracts should be extended.

Conclusion

This study examined waste disposal problems at the urban village level from the perspective of the villagers themselves. Both survey and observation methods were used. While there was a general low level of awareness on the negative effects of waste, there was general agreement that it was a problem that needed to be addressed by the villagers themselves, without relying entirely on government or municipal supported collection.

The villagers expressed a desire that they be included in any discussion or decisions regarding waste within their village. They suggested there would be support for any waste separation activities and that specific bins or plastic bags should be provided for this purpose. They also showed interest in setting-up a biodegradable system at village level for the organic component, by using either vermiculture and/or producing fertilizer from compost. Basic technical support would be required for such activities.

References

1. Keep Vientiane Clean Newsletter (2001). Issue 1. Accessed at: <http://www.ist.cmu.ac.th/riseat/nl/kvc/issue001.pdf>
2. Seminar on Vientiane Environment (1999). Vol. 2-3, p.2 (in Lao).
3. Sayamung, N. (2003). Waste Management for Communities (in Lao).
4. Vientiane Environment Summary (2001). Science & Technology Agency [STEA] (in Lao).
5. Fongkhamdeng, B., Latanavongsa, S., Chanthavong, C., Chouelamontry, T. and Ongsakul R. (2007). Analysis of Household Waste Separation Practice for a Community-based Recycling Project in Sisattanak District, Lao PDR. Sea Uema Project – Jar Monograph Series, AIT, Thailand.
6. Khanal, B.R. and Souksavath, B. (2006). Environmental Management Measures and Current Practices in Solid Waste Management: A Case Study from Vientiane Lao PDR. Greater Mekong Sub-Region Academic and Research Network, AIT, Thailand.
7. Sengtianthr, Virany (2004). Solid Waste Management in Urban Areas of Vientiane Capital City using GIS. 30th WEDC International Conference, Vientiane, Lao PDR.

Note:

Although photographs in this paper were extracted from slides presented during a training course, they also appear in [5] above and should perhaps be credited to AIT.