Original article

The environmental and health impact of recyclable waste shop on the community; case study of Ban Kok, Khueng Nai, Ubon Ratchathani

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Abstract

The recyclable waste business is rising around the world because of developing and high consumption increase more waste. However, in developing country this business is occurred in informal recycle sector with traditional or inappropriate sorting process. These concerned about environmental and health impact on the worker, and people in their community. In Ubon Ratchathani, many local recyclable waste shops are established in Ban Kok community, Amphur Khueng Nai for over 20 years. Thus, this research aimed to study environmental and health impact of recyclable waste shop on the community, by survey and interviewed. The result showed 61 recyclable waste shops were spread over the community area, composed of various types; whole recyclable waste, plastic waste, electronics waste, motorcycle waste, automobile waste, and medical waste. The residents faced problems from waste, such as air pollution, pest and animal-borne disease disturbing, unsanitary waste straggle, and pollution effect on agricultural production from recyclable waste activities as 66.84%, 54.55%, 36.90%, and 36.10%, respectively. Most people in the community concerned about effect on their health 72.46%. Also, the residents have health effect, or ever sick from recyclable waste shop as 31.02%.

Keywords: recyclable waste shop, environment, community

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Introduction

Waste is a global problem that many countries concerned because of the increasing amount each year, including waste from agriculture, households, and hazardous chemicals. Thailand is suffering from waste because development and high consumption lead to waste rising. Many organizations are all aware of the problem and find out of ways to tackle the problem such as 3Rs theory (Reduce, Reuse, Recycle) to reduce waste, and useful resource by repeat using, and process waste into raw material for new products (Pollution Control Department, 2017). Recyclable was can be divided into five categories: plastic, paper, glass, metal, and aluminum, even, electronic equipment can be sorted for valuable metal. Recyclable waste is waste or waste materials, these can be reused by processed into raw materials in the production process such as glass, can, paper, plastic, and metal.

The municipal solid waste that brought to recycle is cause of expose to bio-aerosols from composting facilities and to pathogens from sewage treatment plants. Hundreds of epidemiological studies reported on the incidence of a wide range of possible illnesses on employees of waste facilities and on the resident population. The evidence of adverse health was outcomes for the general population living near landfill sites, incinerators, composting (Giusti, 2009). Furthermore, the studied in Thailand showed the waste disposal site effect many problem; environmental, health, mind, and socioeconomic of people nearby the area. [3]Including electronic waste (E-waste) that classified as hazardous waste, especially heavy metals was dangerous waste that cannot decompose. If this hazardous waste does not have the good process to manage or the deal is not appropriate, it will absolutely to human, environment and economic system. From the past to the present, electronic waste is a global ecological issue. It raises concern about water pollution, soil pollution and air pollution and even human exploitation. The risk of chemical exposure to human and contamination in the environment by Hg, Cd, Pb, Cu, Ni and other heavy metal (Ramesh Babu, Parande, Ahmed, 2007) . These e-waste activities cause severe damage to the environment and expose the workers and local residents to toxic chemicals through inhalation, dermal exposure, and oral intake (of contaminated food). Once taken into the body, toxic organic chemicals are stored in fatty tissues, bioaccumulation and increase the body burden of persistent toxic substances. In addition, air pollution from the spread of vapors and dust, which is harmful to recyclers in the community and people living around (Anna Leung, Zong Wei Cai and Ming Hung Wong, 2006).

In 2017, the volume of waste being generated in Thailand reached about 21.4 million tons (Pollution Control Department, 2018). but both public and private recycling initiatives are on the rise. There were many years that Thai government has been encouraging co-operation among various stakeholders to promote the 3Rs concept in the country. The central government has also been providing technical and financial support to local governments in order to improve existing waste management systems in their area. In addition, guidelines, measures, and standards related to the 3Rs concepts are being developed and disseminated to the local community. As a result of all these efforts, successful recycling projects have been implemented in the private sector as well as local communities (Waste management world, 2011), including in Ubon Ratchathani, there are many junk shop all over the province, but the area with plentifully of this business is located in one community; Ban Kok, Khueng Nai, Ubon Ratchathani, which a various type of recyclable waste, also, be surveyed in this study. However, there were traditional recyclable waste unit, which may cause effect on environmental and health to nearby community. Thus, this study research aimed to study environmental and health impact of recyclable waste shop on the community to reveal the problem in the community for improve the action plan, and prevent environmental and health impact of recycle business activity in the future.

Methodology

1) Research methodology

This study covered Ban Kok, Khueng Nai, Ubon Ratchathani. The study is aimed at identifying the environmental and health impacts of recyclable waste business; Informal recycle unit, sorting site, and junk shop on the human settlements around the area. We collected the data for this study from both primary and secondary sources to present the findings on the environmental and health impacts caused by Informal recycle unit and junk shop at Ban Kok, Khueng Nai, Ubon Ratchathani, Thailand. Firstly, we involved a study of secondary data where in documents and records relating to appropriate data sources including books, journals, newspapers, and activities both published and unpublished were studied to obtain background information on the environmental and health impacts of solid waste disposal. Secondly, we visited the recyclable waste shop area to survey the shop, by observe and interview the owners, and environmental and health impact on the community we interview the household residents in the surroundings, at random. The questions we designed were tailored to derive information on environmental and health impacts caused by solid waste disposal; thirdly, we administered structured questionnaires (both close and open ended designed questions) to 374 households which enabled us to obtain solid information. The first part of the questionnaire obtained data on socioeconomic characteristics such as employment status while the second part obtained information on residents' views on the environmental effect of the recyclable waste shop, and impact to the health of the residents' community.

2) Sample size

In this study, we administered questionnaires to two categories of respondents: nearby household residents to the informal recycle unit or junk shop (<50 meters) and far away household residents (>50 meters). The study area consists of 374 households. Sample size was determined by using a stratified random sampling method. Out of the 374 households, 263 (70%) were nearby residents, and 111 were faraway residents. 70% sample size was the representative population which was easy to manage and came up with good results. This method enabled us to make sure that there was no biasness in the selection of the population who were part of the sample.

Results

1. Type of the recyclable waste, and location

The type of the recyclable waste, and location in BanKok community was separated into 6 types; 1) Whole recyclable waste, plastic, glassed, metal, paper, 2) Plastic waste, 3) Electronics waste, 4) Motorcycle waste, 5) Automobile waste, and 6) Medical waste, peritoneal dialysis bag, which was 7, 20 , 13, 9, 11, and 1 shop, respectively. The received the recyclable waste from the buyer, or junk shop around northeast area of Thailand. The location of recyclable waste shop were spread throughout the community area (showed as Figure 1) The characteristic of their business was purchasing, waste sorting, and some of them processing the waste for selling to the company. There were 23 big entrepreneurs, 76 small entrepreneurs, and 9 wander buyers, which were only, buy the recyclable waste from the urban.

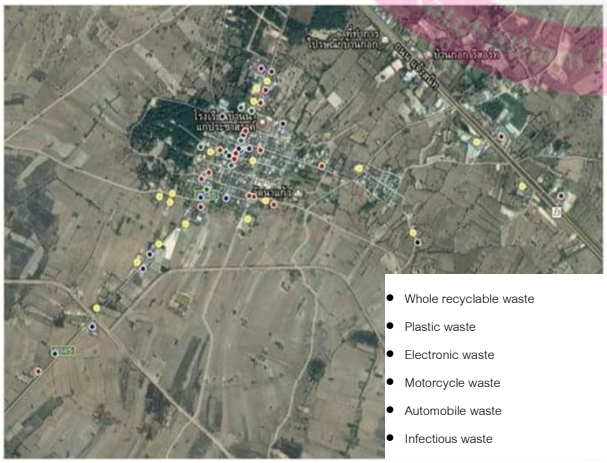

Figure 1 The location of recyclable waste shop in Ban Kok, Khueng Nai, Ubon Ratchathani

2. The personal information and socioeconomic characteristics of respondents

We studied personal information and socioeconomic characteristics of respondents; there were female 58.56% and male 41.44%. The range of the age were 41-50 , 51-60, 31-40, 61-70, 21-30, 71-80 , and over 81 years old with the percentage as 27.01%, 17.11%, 15.78%, 11.50%, 10.96%, 8.29%, 5.35%, and 4.01%, respectively. Most of their occupations were agricultural 61.50 %, government officials 13.37%, business 12.03%, housewife 8.82%, and others 4.28%. Member in family were over 5 persons or more 55.85%, 3-4 persons as 33.33%, and 1-2 persons as 10.81%. Majority of the respondents were not involved with the recycle business (76.74%), but some of them were agriculture as the main job, and part time job were junk shop business, because there were many shop, as source of more income. The water supply in the community; plumping water, and ground water for common use, the stream for agriculture, but for drinking, they buy the bottled water. These activities expose these residents to solid waste particularly hazardous wastes which can lead to various diseases through pollutant exposure.

3. The Environmental and Health Impact of recyclable waste shop on the community

The resident of responder 25% lived nearby the recycle shop (less than 50 meters), and 75% faraway, more than 50 meters. The results of residents' views on the environmental impact from the informal recycle shop, or junk shop showed that the majority of environmental problem was dust and smoke from transporting or burning, 66.84%, pest and animal-borne disease disturbing 54.55%, waste straggle from recycle waste; garbage fallen from the truck, sorting site, and from junk shop, unsanitary 36.90%. Also, effect on agriculture, such as cropping, livestock was effected from pollution around the junk shop (waste, waste water, odor) as 36.10%. The community ever has been accident by fire, or complaints by sorting site recycle waste pollution as 24.60%, and their water supply, household consumption water quality were changed, such as odor, turbid, and color as 20.86% (showed in Table 1).

Household residents, especially those who are closer to the junk shop are merely about the location of the junk shop in their community, because this business was started more over 20 years, and some of them work or involved in the business. However, they complained that the junk shop is close to their houses causing them some pollutant such as dust, and make the area unsanitary. Furthermore, they argued that their surroundings are smelly and filthy and some of the wastes from the junk shop overlap their houses causing pollution in the environment.

The result of health impact on the community showed resident highly concern about effect of pollutant from recyclable waste shop on their health (72.46%), because there were a variety type of recyclable waste shop, some of them is a source of air pollution such as dust, smoke, odor and chemical vapor. In the separating process with machinery make the noise pollution. Also, unsanitary storage waste, mess area cause pest and animal-borne disease habitat which involve people sickness. The residents have well

knowledge about impact of waste on health, because public health volunteer in the community and government agency usually stimulate the safety awareness by public relation. Moreover, the residents have health effect, or ever sick from recyclable waste shop (31.02%); for example headache, eye or skin irritation, nasal congestion, cough and sneeze.

Conclusion and Discussion

This study examined the environmental and health impacts of households living around (nearby) and away (far away) from the recyclable waste shop in Ban Kok, Khueng Nai, Ubonratchathani. Results from the analysis of data revealed that both nearby residents and far away residents be worried from related environmental and health impact due to the location of the recyclable waste shop close to their settlements (Foday Pinka Sankoh, Xiangbin Yan, Quangyen Tran, 2013). It was discovered that residents less than fifty meters from the recyclable waste shop are most affected by the recyclable waste shop. Hence they were sick of irritation of the skin, nose and eyes. This state of health of respondents in this study can be linked to pollution from the recyclable waste shop activities. Agree with the studied (Jutharat Boontho, Thitiya Netsanga, Kanayrath Saita, and Nilobol Kongpirun, 2008) revealed people that settle nearby waste disposal site were effected from three popular health problems respectively: Conjunctivitis, Asthma and Angina, and people also suffered from house flies, mosquitoes, rodent and cockroach. The most serious effects on their daily lives were odorous air pollution, contaminated water. It was also extent of water pollution rise in the raining season as a result of offensive and disease-carrying odor, as well as ground water pollution. In the dry season, dust from the transportation of the waste truck is an important source of air pollution for people living far away from the area. Although, they complained about pollution and health effect, but it cannot significantly identified. Because when they have a symptom, slightly sickness, they did not see the doctor. The study therefore concludes that the recyclable waste shop should be properly located and managed to minimize its effects on the environment. The residents have negative opinion, and most of the concern about health effect, though some of them involved with the recyclable waste business. This similar to studied (Chiraporn Lapkham, Chuleeporn Thepsaeng, Thitima Wonthong, 2016) that people nearby waste disposal site stand with environmental, health, mind, and socioeconomic problem. For improved environmental and health status of the people living nearby the junk shop, it could be improve the junk shop sanitation. Furthermore, efforts to provide regulation of junk shop, and educated the entrepreneurs by environmental and health motivation. It is important for develop this community by public participation which driven by responsible government agency.

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Table 1 The environmental impact from of recyclable waste shop on the community

Topic	percentage	
	yes	no
You or your family work or involve with the recyclable waste shop	23.26	76.74
You suffer from dust or smoke from recyclable waste transportation, dumping, or waste burning	66.84	27.54
There was waste straggle from recyclable waste truck, or sorting site which made your house unsanitary	36.90	63.10
Your cropping, livestock were effected from pollution around the junk shop (waste, waste water, odor)	36.10	63.90
Previously, there was accident by fire, or complaints by sorting site recycle waste pollution	24.60	75.40
Water supply, household consumption water quality were changed, such as odor, turbid, and color	20.86	79.14
There was pest and animal-borne disease disturbing in your house	54.55	45.45