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Scavengers Role in Sustainable Waste Management. Case Studies in Ngempon Subdistrict, District Bergas, Semarang Regency, Central Java Province

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Abstract: Waste has been a problem mostly in big cities, but now it has spread to suburban areas. In fact, garbage is inevitable in our life as both a problem and potential source for living. This research aims to find out the role of scavengers as one of important components in waste management. Scavengers play mutual symbiosis relationship with the society in which they serve as social asset and at the same time they earn living from the activity. However, some parts of the society look down to their presence. As a matter of fact, waste management through dicsrimation and classification of organic waste and non organic one has created positive image on the scavengers who have given sustainable contribution to the environment.

Key words: waste, garbage, scavengers, household livelihood, waste management

1. Introduction

Recently, waste has ranked top position in terms of ecological problems. The increasing number of population also increases the volume of waste. Besides, the changing pattern of consumption of the society has also created more complex varian and characteristic of the waste. In Indonesia many attempts have been conducted to deal with this problem, one of which is the establishment of the Law of Republic of Indonesia Number 18 Year 2008 about waste management. However, the output is still not considered satisfying as the waste still remains a big problem in some areas.

The number of population keeps on growing and creates the lack of job opportunity especially in formal sectors in many developing countries including Indonesia. The number of workforce is growing every year reaching the point of 69 percent which cannot be absorbed only by formal sector. Thus, 73.54 percent of the workforce was abosorbed by informal sector [1]. Informal sectors have attracted many job seekers since the jobs do not require specific educational background or skill and commonly do not have any contract or compulsory tasks, such as scavenger.

Many researches about waste and scavenger have been conducted in many countries including Indonesia. Scavengers street is the main street that has a job as a scavenger to support everyday life [2]. Moreover explained that waste is classified based on its origin, form, forming process, characteristic, and type [3]. Based on its origin waste is classified into ones coming from household, industry, agriculture, trade, and road. In terms of the form, waste is categorized into solid, liquid, and gas (fume, smoke). Waste is also classified into many types. For instance, based on the chemical substance it contains, waste is classified into organic and non organic. Mentions that in waste management

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there are many attempts might be taken, such as landfill, recycle, compost, and incenerator [4]. Recycling plastic waste management can generate heat and steam energy [5]. Most of the housewives who attended the workshop on compost production did not have a good understanding on the importance of waste discrimination [6]. Suggests an integrated approach for solid waste management seen from many aspects including social, economy, culture, politics, environment, involving stakeholders and considering bigger system for holistic care [7].

Even though there have been many researches about it, waste remains a big problem in many areas. Thus, further discussion and study on waste management and the role of scavengers is still relevant. This study focuses on the role of scavengers in terms of their relationship with waste management, environment, social, and economy as well as the strategies performed by the scavengers in managing non-organic waste.

Ngempon Subdistrict, Bergas District, Semarang Regency, is one of the locations for industrial activities. Most of the population work in argicultural and non-agricultural sectors. The emergence of non-agricultural activities is one indicator of economic diversification in the subdistrict [8]. In certain situation, households are vulnerable to risks caused by the changes, so they must have living activities including capability, asset, and activities, which rely on the outcome [9]. This brief paper will discuss how the scavengers play their role in waste management, their strategies and contribution to household income.

2. Research Methode

This research was conducted in Ngempon Subdistrict, Bergas District, Semarang Regency. The research location was one of four villages used as samples in a dissertation reseraach by the author. There were 45 households from each village used as the reserach subject and 11 percent of households in Ngempon Subdistrict Ngempon were reported to perform waste management activity. Eleven percent have the waste management activities are studied in this paper. Variables which were set are a working system, the role of scavengers of environmental, social, and economic, strategy undertaken, and its contribution to household livelihoods.

This study aims to investigate the role of the scavengers and their contribution to household income using survey approach, intensive interview. To obtain more complete data, performed data triangulation to community leaders and government related. Data analysis carried out ways descriptive analysis. Waste management system is working and linkages between types of waste and waste management were analyzed using a flow chart.

3. Research Area Characteristic

Ngempon experienced rural area diversification associated with middle-scale industry and had high accessibility as it was situated in the alternative road from Surakarta to Semarang and regularly used by public transportation. The villlage is located 2 kilometers from the center of Bergas District, 3 kilometers from Semarang Regency, and 17 kilometers from Semarang Municipality. Georaphically it is situated at 110°25'40"-110°26'33" East Longitude and between 7°10'55"-7° 11' 41" South Latitude.

The area covers 1.65 km^2 and is mostly used for non-agricultural field and some parts are used for farming. In 2013 the population of the village was 5,744 people with ratio 87 and 3-4 people per famili in average. The density of the population was 3,481 people per km^2. The main occupation of the people was mostly non-agricultural (95.52%) while the rest (4.48%) work in agricultural sector. Besides, the number of farmer households was 18.3 percent. The non-agricultural activities included civi servant (3.83%), labor (20.55%), construction labor (4.89%), traders and transportation (1.92%) and others (64.33%). Scavenger is included in this "others" group along wth other non-formal occupations.

4. Waste Management Characteristics and Types of Waste

Based on this research, there are 11 percent of households have non-agricultural activities in the field of waste management. Family head of the household is composed of 60 percent male and 40 percent female. All heads of households fall into the category of economically productive population. Working become waste management is the main occupation. Reasons to work into waste management is not requiring higher education, tractable, quickly got the cash. But it must be willing to work hard, because many rivals.

Types of waste management based on the type of waste, namely waste management of industrial wastes and waste management of the household. Garbage from industrial wastes as raw material for small household industry was made into a wide variety of clothing of household garbage recycling industry processed into various types of household appliances.

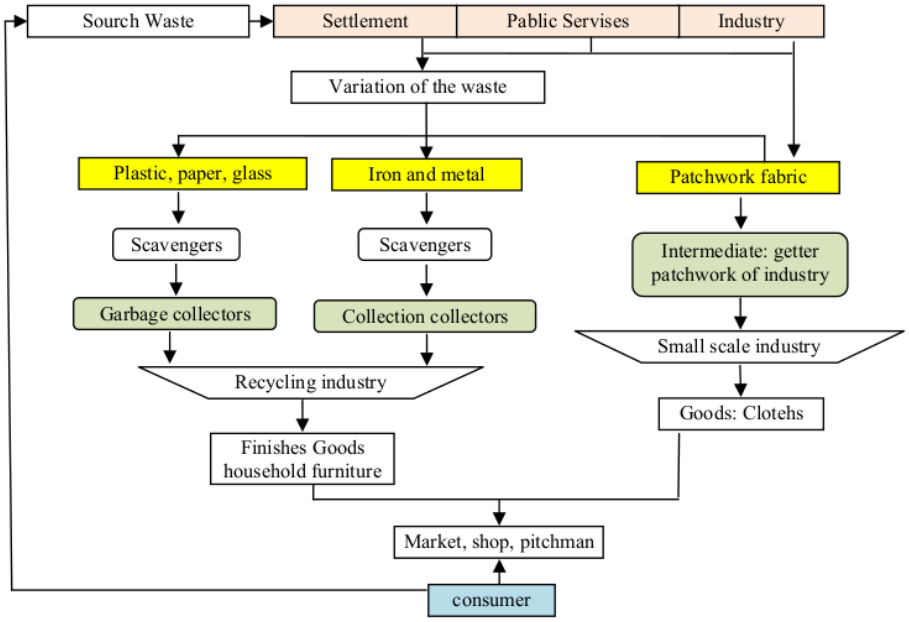

Fig. 1 Relationship between source, sorts and business waste in the recycling process.

5. Working System of the Scavengers

The workers in waste management include collectors, plastic bag scavengers, used stuff buyers, and recyclers. The collector purchases waste/used stuffs which are no longer usable but can be recycled from the scavengers. After discriminated, the waste was then selected and packed until ready in large scale to be then delivered to the recycling factories. There are two types of scavengers: first, plastic bag scavenger is one who walk around the area carrying plastic bag to pick waste/used stuff which can still be recycled. They do not need any capital since they do not have to purchase the stuff. The collected stuffs are then sold to the collector. Meanwhile, another one is used stuff buyers who purchases used stuff such as hardware or plastic stuff, so they need some capital to get the stuff. This type of scavengers usually use bicycle or motorcycle going around the area looikg for those who want to sell used stuff. The collected stuff is then sold to the collector.

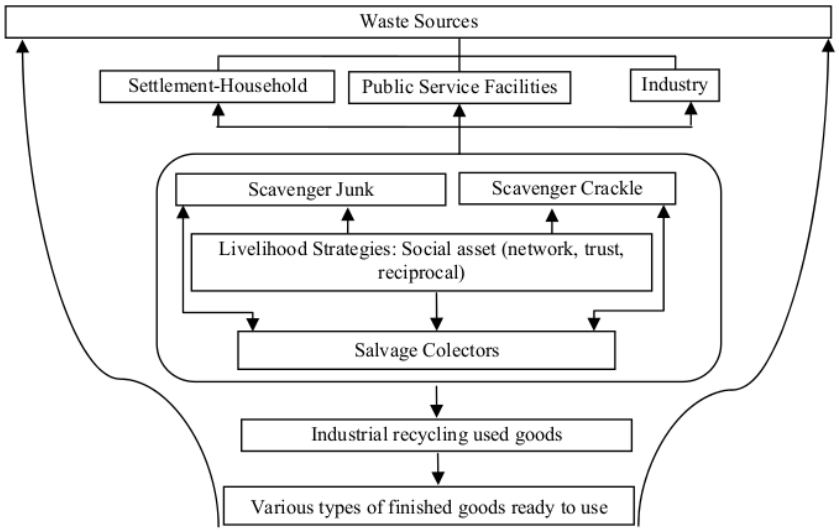

Fig. 2 Flowchart work systems scavengers in waste management.

The scavengers work eleven hours per day, going around housing and settlement, public services, such as market, hospital, shops, and industry. The collected stuff includes glass bottle, plastic bottle, other plastic stuffs, paper, cardbox, metal, can, etc.

This group of waste management work on a system in which each member has each its own role; the scavengers collect the stuff, the collector purchases the stuff from the scavengers, and then packs them to be delievered to recycling factories. This recycling industry recycles and reproduces new stuff to be then sold to consumers. After used by the consumers, at certain time the stuff will be then collected by the scavengers and the cycle starts all over again continuously.

6. Livelihood Strategies of the Scavengers

Strategy or method done by the scavengers for living is mainly social capital or asset including networking, trust, and reciprocal relationship. This networking strategy becomes essential in this job inn which the scavengers interract with anyone as long as they do not tresspass other's territory. This strategy is performed by all members in the system includes the owner of the used stuff, the collector, the reseller, and other officials.

Trust is a priceless social asset necessary in this job; from this trust can be buil solidarity among the members of the system. Besides, there is an interesting fact about the trust between the scavengers and the collector. The colector as the capital owner gives free loan without any interest to the scavengers; they only rely on the trust and honesty from the scavengers. The trust built between the collector and the scavengers can be maintained as they feel to be on the same boat; they work on the same sector. In Ngempon, one collector has 7-9 scavengers in which every week receive a loan 500.000 -1.000.000 rupiahs for each depending on the condition of the scavenger.

Reciprocal strategy done by the scavengers and the collector is possible since they have been helping one each other for quite long. Each of them expect rewards from the kindness they have performed. The scavengers need the collector who provide the capital, while the collector needs the scavengers to collect the used stuff. This relationship creates a mutual symbiosis.

Social asset which consists of networking, trust, and reciprocal relationship used by the scavengers at the same time also plays a social role in waste management.

This fact is relevant with opinion stated who explain that living strategy is necessary for sustainable life.

7. The Role of Scavengers in Waste Management

One of ways to manage the waste is recycling. The process of recyling non-organic waste begins with discriminating, collecting, shipping, and processing. The key to success in this process relies on the first stage (the discrimination) since without this step there will be new problem. The role of the scavengers in waste management for recycling is callsified into 3 types: ecology, social, and economy.

7.1 Ecology Role

The scavengers play the role in accelerating the decomposing process. By doing their job, picking and discriminating waste, the organic waste will be composed more easily. Besides, by picking out the waste from the environment, the volume of the waste also reduces. This activity helps the process of waste recycling.

The type of waste was mostly picked by the scavengers are paper, cadbox, plastic, metal, glass, bottle, in various amount. The scavengers plays the ecology role which is very essential in recycling process. The amoung of waste they collect is in line with the size of their contribution to the waste management in their environment.

One of the roles of the scavengers in recycling process in Ngempon is selling bottles (beer/syrup/sauce) to sauce factory. This activity creates a cycle of collecting the bottles, submitting them to the collector, and then selling them to the factory. The reproduced bottles are then sold to shop/market to be consumed.

This waste management strategy has given a huge benefit to the environemnt in which it has reduced the volume of waste and accellerate the decomposing process. This fact is relevant with an opinion stated that the technology of recycling plastic waste gives big contribution to waste management in terms of ecology [5].

7.2 Social Role

The scavengers plays a social role which is shown by the interraction among the scavengers, between the scavengers and the collector, between the scavengers and the society, and the collector and the recycling industry. The plastic bag scavengers walking around whike doing their jod; thus, they have to interract and behave politely in order to create a good harmony with the society.

The scavengers and the collectors have a good social interraction because they both have a relationship of patron and client. The patron needs the waste collected by the scavengers, while the scavengers need the patron to sell the waste they collect. The role ole scavengers in this recycling activity is very essential but often to be considered inferior. On one hand, the scavengers are tryinh to survive. On the other hand, they also have to face against dominating external power which puts them in the corner. In reality, these social pressure and social gap have put them into subordinate position and marginalized in the development process.

The relatioship built between the scavengers and th collector based on social and economical interest. The social interest is built by the reciprocal interraction mutually beneficial for both the scavengers and the collector. The collector as the patron gives space and trust to the scavengers without any guarantee.

7.3 Economy Role

The economy role of the scavengers is classified into two: the role in trading and the role in household living. The scavenger is an important actor in the chain of used non-organic stuff trade. Their presence also can support the economic activity because they are not the only actor in this economic activity. There are other actors such as the collector and the recycling industry. In large scale, the scavengers, the collector and the

recycling industry give big contribution to the econokic activity. The reccling industry cannot work without the supply from the collector and the collector cannot supply the the stuff if there is no scavengers. Tus, each of them has their own role.

This study result supports opinion stated by Sinaga [11] that the scavengers in the chain of recycling industry is placed as the producer. They are the actor who has the role of looking for the waste as the commodity to be processed and sold with higher value.

In household scale, economically speaking, the income of the scavengers gioves contribution to the living of the household about 50-60 percent. Those whose household relies only on this job gives bigger contribution than those who have other jobs. The income of a small scale plastic bag scavenger is smaller than the used stuff collector, which is around Rp 20.000-50.000, and Rp 30.000-55.000, every day. If there is an unexpected necessity the scavenger can easlily get loan from the collector. The collector has the capital who receives income Rp 3.75 juta per month, while the industry can earn 4 million per month. This result is relevant with the reserach conducted [12] explaining that the income of scavengers gives contribution to solve household necessities.

8. Conclusion

The scavengers plays ecology, social, and economic roles in waste management. Their role has to be seen as a part of society; they are professional, clean, and honest. The working system creates a cycle between patron and clien which are dependant one each other. The social asset includes networking, trust, and reciprocal relationship to be used as the survival trategy of theior household. Wate management by discriminating waste into organic and non-organic gives positive image to the scavengers and contribution to sustainable environment. Expected to be cooperation between government, private, and community, in waste management.

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