

Collaborating the Role of Stakeholders in Waste Management

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Abstract

The main problem of waste management on small islands is that the amount of waste often exceeds the capacity that the island can handle, due to the limited availability of land, volume of land, budget, and human resources. Unmanaged waste generation has ecological impacts such as environmental pollution, and loss of natural resources; economic impacts such as decreased productivity; social impacts such as the emergence of conflict, and health impacts such as increasing the number of environmental-based diseases in the community and the wider environment. The stakeholder role collaboration strategy is needed. This study aims to formulate a collaborative strategy for the role of stakeholders in the proper management of Penyengat Island, Tanjungpinang City. This research method is qualitative. Waste management on the island of Penyengat demands the role of the government, the private sector, and the community. The government moves in terms of regulations, facilities, and implementers. The role of the private sector is more to provide funds and empowerment. While the role of the community is more on empowering efforts to reduce waste and its utilization.

Keywords:

Collaboration, Stakeholders, Waste Management, The Small Island

INTRODUCTION

Increased production and consumption of goods manufacturing and packaging leads to an increase in waste production. Most countries struggle to cope with the increasing and complex waste problem [1], [2], [3].

Penyengat is a small island with a limited human and environmental carrying capacity. The waste generated is more than the island's ability to manage it, the limited availability of land, the volume of land as cover, and human resources in its operation. Lack of public understanding the awareness in waste management is a big problem. The generation of unmanaged waste has ecological impacts, environmental pollution, economy, and breeding grounds for vectors and nuisance animals to have an impact on increasing environmental-based diseases. Transporting waste from small islands is financially and environmentally beneficial [4] Activities to reduce the amount of waste by limiting the use of goods that generate waste,

reuse, and recycle waste into valuable items. Meanwhile, good waste management separates by type, collection, transportation, and waste processing for the final stage. The waste reduction should have been carried out at the source of waste by each individual. Agencies carry out waste management activities which responsible for cleanliness in an area, including a series of waste handling processes ranging from TPS (Waste Landfills) to TPAS (Final Waste Processing Sites) in an environmentally sound manner. The waste minimization model correlates with waste reduction: on-site waste segregation, reuse, and recycling. After training the waste minimization model, there was a significant decrease [5], [6], [7].

Collaborative partnerships between the environmental NGOs and stakeholders that has improved with stakeholder engagement, access to resources, financial support, transparency and accountability, and implementing key initiatives (separation of

sources, expansion of collection services, revision of fees, reuse of materials, education, and awareness and planning) of sustainable waste management [8]. The city government in Langkawi needs to find and adopt a model for waste management that emphasizes efficient and sustainable waste management on Langkawi Island, based on waste composition, and views of residents and tourists on the island's waste management issues [9].

One of the boosters for recycling and waste reduction in the Japanese context is the shortage of final processing sites due to the country's high population density [10] indicates limited waste management capacity boosted by increasing population policies. Sole ownership and management of the landfill site by the government (as opposed to joint ownership or the absence of a landfill site) assists in the segregation and collection of resources and extends the span of the landfill [11].

Empowerment is a concept oriented towards reducing formal and informal barriers, as well as efforts to give strength to communities, institutions, and government [12], [13], [14]. Empowerment is an effort to make the community independent so consciously, that they are competent in making decisions and solving problems independently. Empowerment of public health is an effort to raise awareness and the ability of the community to have the strength to live independently in realizing optimal health degrees. The occurrence of affective, cognitive, psychomotor, and conative empowerment can contribute to the creation of independence.

The wrong assumption in terms of community participation is that local governments must assume responsibility for waste management and the community is not expected to take part or contribute [15]. The level of community involvement in waste management depends on the initiatives of local authorities [16], [17]. Government agencies and citizens must take an active part

to realize the operational efficiency of waste management, and community participation in decision-making is mentioned by experts as a socio-cultural aspect [18] in addition, public awareness and social apathy for solutions [19].

METHOD

The research method is qualitative. A systems approach is applied to formulate a collaborative strategy for the role of stakeholders in the proper management of Penyengat Island, Tanjungpinang City. The qualitative approach was performed by in-depth interviews occupying interview guidelines aimed at exploring the implementation of the role of all stakeholders in responding to the needs of waste management on Penyengat Island, Tanjungpinang City. The results were refined with FDG and consensus deliberation in determining priority actions to be carried out as an implementation of the collaborative role of stakeholders in waste management on Penyengat Island, Tanjungpinang City.

The sampling method to determine informants for the qualitative approach who are relevant stakeholders to explore information and knowledge (acquisition of expert opinion) is determined/selected intentionally (purposive sampling).

The principal considerations in determining stakeholders use the following criteria: The existence of respondents and their willingness to be respondents. Has a reputation, position, or position and has demonstrated credibility as an expert or expert in the field under study. Have experience in the research field.

The stakeholders who occupied as respondents were six people; 17 represented stakeholders in this study which consisted of the government elements as a responsible agency and had duties and functions related to waste management. Other stakeholders are the community, religious leaders, traditional leaders, and cultural leaders. The private stakeholders are coming from NGOs and professional organizations

RESULTS AND DISCUSSION

Waste processing on Penyengat Island only lasts until the third stage, namely storage, collection, and transfer, without transportation and the final waste process. The container condition is open overly, without any sorting by type of waste. Garbage collection by the community by utilizing the containers provided on the side of the road is only a route to tourist attractions, while for public settlements, the amount is insufficient. Most people who live in coastal areas throw it into the sea. The stages of the collection and transfer process with the absence of sorting, leaking, and open conditions will cause pollution, both from community sources and government transportation facilities during the storage and transportation process. Community leaders on Penyengat Island stated:

“...tempat sampah untuk masyarakat daerah pesisir dari pemerintah belum ada. Untuk sampah yang berada di bawah rumah yang tok bisa bersihkan tok bersihkan, tok angkat dan bakar di darat. Tapi ya tak banyak soalnya berat juga...”
(Community Informant (A))

The Urban Village and also a resident of Penyengat Island stated:

"Ya... untuk sampah, masyarakat yang tinggal pesisir pantai, kadang ada kumpul dan dibuang ke wadah sampah yang disediakan oleh pemerintah, jika wadahnya tak jauh sangat dari rumah... tapi banyak jugalah yang hanya menggunakan kantong plastik saja..." (Urban village informant (A))

However, the community's response to this has not been seen; there is a lack of public awareness to provide trash cans on their initiative in households and throw the garbage into the landfill.

Garbage collection by the community on Penyengat Island, LPM stated:

"...bagi masyarakat wilayah pelantar tepi laut tak jarang dari

mereka langsung membuangnya ke laut, sampah ikan sayur tak terkecuali sampah plastik. Seharusnya masyarakat sendiri yang mengumpulkan dan memilah sampah, dan jangan membuang sampah ke laut terutama sampah plastik. Tapi mereka bilang dah biasa. Latah mereka sikit-sikit buang dekat laut...kan bisa langsung hilang, begitu tanggapan yang sering saya dengar dari mereka..." (LPM Informant (M))

Response from Public Works Office stated:

Kami memang hendak menata tata ruang Penyengat nih, artinya fasilitas apalagi berkaitan dengan sanitasi yang memang harus memperhatikan keberadaan situs, mengingat Penyengat adalah wilayah cagar budaya., maka dari itu memang ada tindak lanjut dari pertemuan minggu kamaren, untuk tata kelola Pulau Penyengat urung rembuk bersama masyarakat... (Government Informant (MH))

Operational technical of waste collection on Penyengat Island is adjusted to the geographical conditions and the available road facilities. A suitable fleet to use is a tricycle rickshaw with an open box at the back, but ideally, the box is closed and does not leak easily. The box already has a container that separates organic and inorganic waste.

Some land settlements use a communal pattern. Garbage is transported by cleaners from the Sanitation Office of Tanjungpinang City with a rhythm of transportation time only once a day in the morning. There are twelve officers appointed by the relevant offices for the coastal area, nine officers for the mainland area, and two officers for transporting garbage using a pick-up (3-wheeled motorbike). Waste is transported and collected at one landfill point at the edge of Penyengat Island.

Regarding the final processing of waste, the head of neighbourhood stated:

"...Di wilayah saya paling banyak terkena dampak sampah, sampah seluruh penyengat nih masuk ke wilayah saya, di tumpuk di ujung... kadang kala baunya dikeluhkan warga, belum lagi ada alat. Saya harap pada perhatian dari pemerintah kita bersama...lah... (The Head of Neighbourhood Informant (M))"

In Penyengat Island, it is impossible to transport waste from TPS Penyengat to TPA Ganet, Tanjungpinang City, because there are problems with inadequate waste transportation equipment and high operational costs.

Office of Public Housing, Sanitation dan Parking of Tanjungpinang City, Stated:

"...belum bisa dilakukan pengangkutan sampah dari Pulau Penyengat ke Pulau Bintan. Biayanya besar dan volume sampah pun tak sedikit. Wacana ke depan direncanakan pengadaan kapal urug yang bisa digunakan dalam pengangkutan sampah Penyengat ke TPA Kota yang ada di Ganet" ...disana pengelolaan sampahnya sudah baik dengan sistem sanitary landfill, ada tempat pengolahan kompos juga..." (Government Informant (SZ))"

Ideally, there should be a system through an institution that empowers the community so that the volume of the transported waste is not large, and the waste transported is only in the form of residual waste.

The Penyengat Urban village, and also Penyengat native stated:

"...Kami dari pihak Kelurahan sudah pernah melakukan pengangkutan sampah dari Penyengat ke Tanjungpinang dengan akses laut, namun biaya yang dikeluarkan besar untuk sekali pengangkutan, kisaran biaya kurang lebih Rp 400.000, -

per sekali pengangkutan (Urban Village Informant (S))

Due to the absence of a transporting waste process from TPS to City TPA according to the waste management system, so the waste accumulates on one land with mixed conditions of organic, non-organic, and B3 waste.

Environmental Office of Tanjungpinang City, stated:

"...Baiknya memang masyarakat dapat mengurangi sampah, memilah sampah, dan memanfaatkannya sehingga sampah yang diangkut keluar pulau hanyalah sampah sisa. Sebenarnya Kerjasama kita bisa sangat menguntungkan... minta tolong peran ustad dan tokoh agama serta tokoh masyarakat, serta sekolah baik juga bisa... sama-sama mengingatkan... untuk kebaikan Penyengat juga sebagai pulau warisan..." (Government Informant (SH))

The response from secondary school on Penyegat Island stated:

"...apapun itu kalau untuk kebaikan peningkatan pengetahuan dan pemahaman peserta didik, untuk memiliki karakter yang santun dan peduli lingkungan" pendidikan karakter saya setuju diberikan..." (School Informant (SF))

The response from the secondary school in Penyengat Island stated:

"...menerimanya tapi tolong bimbing kami apa yang harus kita lakukan, kami tak paham sangat soal itu... kalau semua jadi paham dan sadar apa salahnya..." (School Informant (EP))

...saya lihat penduduk dan anak di penyengat nih, kurang peduli ya... terhadap lingkungan, sikap cuek membuang sampah sembarangan. Dunia Pendidikan Insya Allah bisa mengubahnya. Penanaman rasa peduli kami coba buat dengan

menasehati mereka untuk tidak membuang sampah. Kami ingin langkah lebih jauh lagi dalam mendidik anak cinta lingkungan (School Informant (S))

Regarding coaching for Environmental care schools, Local NGO responded by stating:

“...saya dan pak (J) siap membantu untuk turun ke sekolah, kami dah lama juga ingin memberi pemahaman pada anak-anak melayu ... senang rasanya bermain sambil belajar tentang lingkungan dan sampah dengan mereka..., terima kasih dah ikutkan dan ingatkan PR (pekerjaan rumah) kami... yang sudah kami niatkan... bulan depan kami turun..., ya kak (SH) izin kami, menyapa pihak Dinas Lingkungan Hidup...” (NGOs Informant (K))

In terms of financing, there are no costs involved in managing waste on Penyengat Island, which is issued by the community both in the process of transporting, collecting, and disposing of waste. It is because the process is carried out by the cleaning service through officers. Aspects of legal regulations, regional regulations already have legal provisions governing waste management, namely regional regulations number 14 of 2009 and regional regulations number 3 of 2015.

Public Housing, Sanitation dan Parking Office of Tanjungpinang City, Stated:

.... ya, tentu. Pemerintah memiliki UU no. 18 tahun 2008. Untuk Pemerintah Kota Tanjungpinang memiliki Perda no. 12 tahun 2009, dan perda terbaru no. 3 tahun 2015...tapi dalam penerapannya masih jauh dari harapan... (Government Informant (SZ))

However, the lack of socialization in the delivery of local regulations, so that many people do not know the provisions of waste management, there are even people who throw garbage in the area of cultural heritage sites. This is evidenced by the ongoing processing of waste by burning.

Environmental Office of Tanjungpinang City, stated:

“...sosialisasi dan penyuluhan akan kita tingkatkan, setelah pemahaman itu ada, peraturan pun akan kita perketat (Government Informant...” (SH))

The aspect of community participation is still said to be lacking, the community has not been able to be involved in their initiative.

Public Housing, Sanitation dan Parking Office of Tanjungpinang City stated:

“...masih belum banyak masyarakat yang menerapkan pengelolaan sampah dari sumber...” (Government Informant (S))

Environmental Office of Tanjungpinang City stated:

“...penyampaian dalam bentuk sosialisasi dan himbauan melalui radio atau televisi. Pihak kelurahan juga melakukan himbauan kepada masyarakat...” (Government Informant (SH))

If there are institutions that carry out the wishes of a small part of the community, it can be facilitated and disseminated. Dissemination can be done by utilizing the literacy park which is already a library and a location for counseling and training with adequate supporting facilities.

NGOs stated:

“..ada hal yang mungkin kita harus kaji kembali, harus ada perhatian masyarakat akan lingkungan, alam dan lingkungan memberikan yang banyak, baiknya kita memberikan timbal balik menjaganya... tak salah juga mungkin ada wacana bahwa ada sejumlah dana yang di pungut untuk wisatawan yang datang kemari, sebagai bentuk kepedulian, dan penghargaan atas rasa indah, sejuk dan aman yang diberikan lingkungan kepadanya...(NGOs Informant (K)).

The participation of stakeholders, especially from the sanitary Office of Tanjungpinang

City and the Environmental office of Tanjungpinang City, must become a unified system in integrated and sustainable waste management. A bond that must continue to coordinate with each other, and collaborate in their roles. The Environmental Service is in the realm of waste reduction programs or upstream by providing awareness efforts to all parties, especially the community in terms of reducing waste, especially from good sources from the community and wider producers who produce goods, especially in the form of plastic packaging. The activity is carried out by empowering the community and there has been confirmation from the DLH that there are funds for the provision of tools and operational institutions that carry out waste management on Penyengat Island in the form of a Waste Bank.

Then the Sanitary Office of Tanjungpinang City is the agency responsible for the waste handling process program. Waste management starts from the collection, transportation to final management (at TPA Ganet Tanjungpinang City). Activities carried out in the form of a compost house. So on Penyengat Island, a TPS3R institution has been formed which has 2 (two) primary forms of activity, namely the Waste Bank and the Compost House as a form of waste reduction and handling effort. The rest of the waste (residual waste) from TPS3R's efforts will be transported by dredgers to the Sanitary office of Tanjungpinang City, with a certain period, according to the volume of waste and the level of TPS3R's efforts in reducing waste (confirmed with the relevant Office at the FGD event).

The amount of waste often exceeds the island's capacity due to the limited availability of land for waste disposal, budgetary funds, and human resources. As a result, much solid waste is burned or disposed of by the community, some even being dumped directly into the sea [20], [21]. The process of recycling waste often has difficulty in marketing [8], [22]. Waste management counseling can increase individual knowledge

about waste management. Waste management counseling provides individual awareness of the environment, knowledge, skills, values, and experience to solve environmental problems, including waste management. Training and counseling are needed to increase knowledge and environmental attitudes of the community to increase awareness in managing household waste [21], [23]. In the end, it will increase the individual's concern for the environment. Environmental concerns are related to waste sorting and recycling behavior [24]. That the level of education and income is also related to the behavior of sorting waste at the household level in Penyengat Island. People with low education are more likely to sort their waste than those in highly educated households. Previous research has shown that educated people are more likely to segregate waste than less educated people [23].

An integrated and sustainable waste management model (ISWM-Integrated Sustainable Waste Management) with a multi-actor focus, multi-layer agreement on technical social systems [25]. ISWM places the formal sector and informal business in the overall technical social system of waste management. The ISWM framework recognizes three main dimensions of waste management, namely stakeholders, elements of the waste system, and aspects of sustainability [23]. Integrated waste management combines technology by adapting local situations and conditions [26]. The success of waste management is not only the government's responsibility but also the support from the community. No matter how well the system is built, it still requires the role of the community as a producer group as well as waste management and utilization benefits from waste management. The support of government and private cooperation in fostering habits and culture of managing waste in an area. Participate in the form of cost, operational and maintenance investments in waste management on small islands [27].

Waste management from source to final disposal employing manufacture and separation, collection & transfer, processing, recycling, and final disposal is not enough. An enabling environment and stakeholder engagement that influence each other also play a significant role in providing impact in the sector of waste management. Good waste management must be supported by at least five main aspects, namely legal, institutional, financing, technological, and socio-cultural aspects. In this way, the three main objectives of waste management are public welfare, environmental quality, and turning waste into a resource. Consider the area of land, the volume of land to stockpile, the carrying capacity and capacity of the environment as well as from the aspect of financing and human resources in its operation. The importance of reviving community independence in terms of island waste management, then the most likely thing to do is TPS 3 Ron Penyengat island. This system will revive the community's independence because of a high sense of responsibility, need and concern for the sustainability of nature and the environment as well as common health. Incoming waste has been separated from the source. It is to optimize TPS 3R performance. Segregated waste collection can be performed by making bulkheads on garbage collection carts or by creating a scheduling mechanism for transporting waste according to its type, for example, intermittent waste for organic and inorganic. Waste processing through a process of sorting (physics), organic (biological) waste into compost, recycling of inorganic waste, compaction, or enumeration (physical process) to optimize the volume distributed to recyclers, as well as transporting waste to a waste landfill for residual waste. Meanwhile, Hazardous and Toxic Waste (B3) is collected and managed according to applicable regulations.

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related to the government, community agencies and the community

CONCLUSION AND SUGGESTIONS

Waste management on the island of Penyengat demands the role of the government, the private sector, and the community. The government moves in terms of regulations, facilities, and implementers. The role of the private sector is more to provide funds and empowerment. While the role of the community is more on empowering efforts to reduce waste and its utilization. Efforts are made with TPS 3R inorganic waste management through waste banks and organic through compost houses. Meanwhile, the remaining waste that cannot be processed is recommended to be transported by ship to the larger islands where it will be processed using a sanitary landfill system.

The Tanjungpinang City Government is expected to assist the waste care pilot village on Penyengat Island as a form of declaration of joint commitment so that it will become a model for its small island and will realize integrated small island management. The Tanjungpinang City Government is expected to coordinate waste management on Penyengat Island with the 3R TPS approach, with the synergy of the government, the private sector, and the community.

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