

Real situation and solutions for solid waste management in Tien Yen district (Quang Ninh province)

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Abstract

This article discusses the solid waste management status in Tien Yen district, Quang Ninh province. As a result, we have achieved exceptional results that significantly contribute to raising awareness of the hazards of solid waste to the environment and human life. Concurrently, this paper demonstrates solid waste management challenges and hurdles, as well as essential solutions to overcome problems in Tien Yen district (Quang Ninh province), thereby contributing to the protection of the environment and human life.

Key words: : Solid waste management; real situation; solutions

1. Introduction

As a result of socioeconomic development and rapid population growth, municipalities are currently producing an increasing amount of solid garbage. As a result, one of the top priorities for environment protection and sustainable development is solid waste management. The localities of Vietnam in general and Tien Yen district (Quang Ninh province) in particular, are increasingly developing and growing in terms of socioeconomic development, the rapid increase of the population, particularly the urban population, has created great pressure on the environment when the amount of solid waste is increasing due to a variety of emission sources.

Meanwhile, solid waste control and management remain limited, increasing the likelihood of severe impacts on the ecosystem and having a highly detrimental influence on the environment, as well as on health and life of local people. As a result, the proposal of some solutions to solid waste management in Tien Yen district (Quang Ninh province) is a critical and required task for the community.

2. The scope and method of case study

The current state of solid waste management in Tien Yen district, Quang Ninh province, is the subject of this paper's investigation. The article employed analysis, synthesis, and data processing methods to clarify the current condition, constraints, and difficulties in solid waste management in Tien Yen district, Quang Ninh province. The research findings primarily rely on secondary material gathered from publications, books, periodicals, and television.....

3. Tien Yen district solid waste management situation

Tien Yen district, Quang Ninh province, is undergoing economic and social development, with an increase in the number of manufacturing, commerce and service enterprises. On the one hand, creating jobs for employees; on the other hand, increasing the amount of solid waste generated in the district, putting strain on the environment.

In accordance with Decree No. 38/2015/ND-CP on the management of solid waste and scrap: "Solid waste is defined as waste that is solid or viscous (also known as sludge) and is discharged from manufacturing, business, service, daily life or other activities".

Currently, due to a lack of appropriate management systems, rules, policies, solid waste poses numerous health risks (including some infectious diseases, odors, ...), as well as environmental consequences (water pollution, soil pollution and air pollution...). The Asian Productivity Organization (AOP) published a report on Solid Waste Management: Issues and Challenges in Asia in 2007, this report included a chapter on Viet Nam, which pointed out that the management of MSW, to a certain extent, is inadequate, particularly in urban regions of the country. The report stated that there were practices of uncontrolled and long-term storage of waste, disposal site, nonengineered landfills and use of waste to fill-up the vacant areas. These practices have resulted in the percolation of water soluble hazardous components of the waste to the groundwater and contaminating the groundwater. The discharge of waste without adequate treatment in waterbodies, such as the rivers, is causing a contamination of surface water which is making the water unusable for drinking and becoming harmful to aquatic life. Open burning of the waste affects the air quality of the region [6].

Identify goals and offer some efficient solid waste management solutions that will contribute to improving environmental protection and boosting the long-term development of areas in general and the Tien Yen district in particular. Within the scope of the research, the paper focuses on examining and evaluating the current state of solid waste management in the Tien Yen area in order to identify

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flaws and limitations and to take appropriate measures to address those issues.

Rick LeBlanc, the author of a scientific article, contends that: "Solid waste management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economic, aesthetic, engineering and other environmental considerations" [7].

The primary goal of solid waste management is reducing and eliminating adverse impacts of waste materials on human health and the environment to support economic development and superior quality of life. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup [7].

The Government issued Decree No. 38/2015/ND-CP on April 24, 2015, plainly stating: "Management of hazardous waste, household waste, common industrial waste, liquid waste products, wastewater, industrial pollutants, other particular wastes and environmental preservation in the import of scrap are all included in solid waste management" [3].

Currently, the rapid economic and population growth is accompanied by an increase in waste production, which harms long-term economic and social development. The environment and people's livelihoods are negatively impacted in numerous ways by the deficiencies and inadequacies in solid waste management, notably as follows:

In the regions, numerous industrial clusters, hotels, offices and residential zones have high population density;



Figure 1. Tien Yen district landfill pollutes the ecosystem [8]

production and business activities are carried out on a regular basis.... As a result, there are numerous sources of solid waste creation, such as: (i) Family; (ii) Places used for commerce and services (markets, hotels, supermarkets, restaurants, etc.); (iii) Offices (offices, schools, hospitals, etc.); (iv) Public places (bus stations, parks, amusement parks, streets ...); (v) Services for cleaning (street sweeping, tree trimming ...); (vi) Manufacturing plants; (vii) Industrial parks, industrial clusters and craft villages.... These emission sources are causing an increase in the amount of home solid waste (which accounts for the lion's share), medical solid waste, industrial solid waste and so on in the communities, particularly in cities, making soil degradation,



Figure 2. Tien Yen district waste treatment with manual incinerators [4],[5]

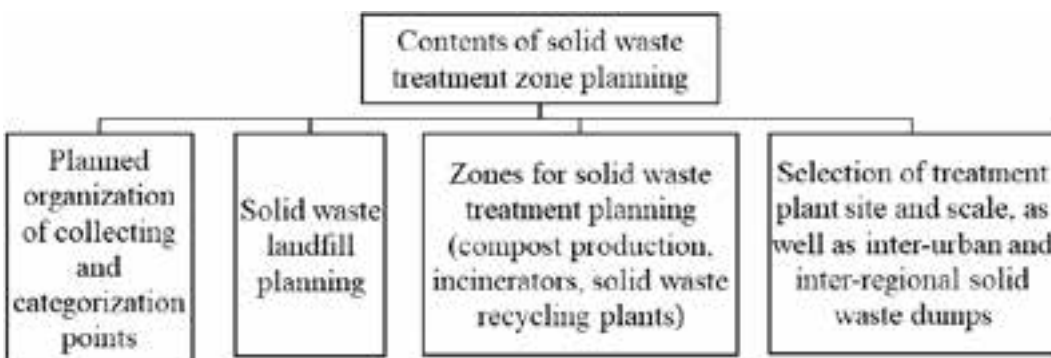


Figure 3. Solid waste treatment zone planning content



Figure 4. Solid waste segregation at the source

air pollution and water quality deterioration, endangering people's health and lives.

In recent years, in localities in general and in Tien Yen district in particular, a big percentage of people have turned to non-agricultural jobs and people's consumption has also changed. As a result, prior recycling initiatives have become overburdened with waste, jeopardizing land, water, air and human health.

Tien Yen town and communes in the district arrange daily waste collection after identifying dangers associated with solid waste management difficulties, concentrate on bringing to the landfill's treatment area of Cong To village, this is the location where domestic garbage from the district's eight communes and municipalities is gathered. However, over time, the landfill has become overburdened and the treatment procedure has become obsolete, negatively impacting the lives of nearby residents [8]. As a result, the district's policy was to close this landfill and transport it to the Tien Yen solid waste treatment complex, which was created in Tai Noong village, Dong Hai commune, with a capacity of 400 tons/day. The maximum design capacity for managing and eliminating home garbage is 250 tons per day and night; the maximum design capacity for treating industrial and medical waste is 150 tons per day and night [1].

However, solid waste in the Tien Yen area has not been classified at the source; the rate of solid waste collection in the Tien Yen district is approximately 70%, with rubbish collected and transported to the main dump; basic treatment by burial, manual burning and lime sprinklement [2].

For construction solid waste, preliminary classification is performed, the garbage can be used to generate economic value: plastic, packaging, iron and steel are sold to agencies scrap purchasing division.

Đối với chất thải rắn xây dựng, việc phân loại thực hiện một cách sơ bộ, các chất thải có thể tận dụng được mang lại giá trị kinh tế: nhựa, bao bì, sắt thép..... được bán cho các cơ sở thu mua

phế liệu. Other non-recyclable waste must be mixed with household waste, such as dirt, sand, concrete, broken bricks and tiles....(a component is utilized for additional reasons such as leveling and foundation leveling.....).

There are also many difficulties in treating medical solid waste because of the medical stations in Tien Yen area, only Tien Yen hospital has invested in developing a wastewater and solid waste treatment system, the hazardous waste satisfies the standard; on average, 10-15kg of hazardous waste can be handled per day; there are three medical stations nearby that have carried hazardous waste to the hospital for treatment. The remaining medical stations are 10-30 kilometers away and staff is scarce, making it difficult to transport and collect rubbish from the stations to the incinerator, simple methods of hazardous waste disposal include burial or manual burning in brick kilns using charcoal fuel [2].

In terms of household waste treatment, most people gather according to household and treat themselves in the traditional rural manner (self-burning). Toxic waste from agricultural output, as well as industrial and handicraft production facilities, has received little attention, primarily self-collect, rent or dispose of according to rules [2].

4. Provide some solutions

4.1 Plan for and locate solid waste treatment zones that are appropriate for local conditions.

The planning of a solid waste management and treatment system that includes both municipal solid waste and hazardous waste in a synchronized and environmentally friendly manner is critical in zoning planning.

Cities must prioritize the planning of solid waste management and treatment systems during the development phase; the specific requirements are detailed in Figure 3 below:

Simultaneously, carry out socioeconomic growth in tandem with Environment protection in a holistic manner, with a plan to limit the adverse impacts of solid waste on the natural urban environment, thereby avoiding environmental

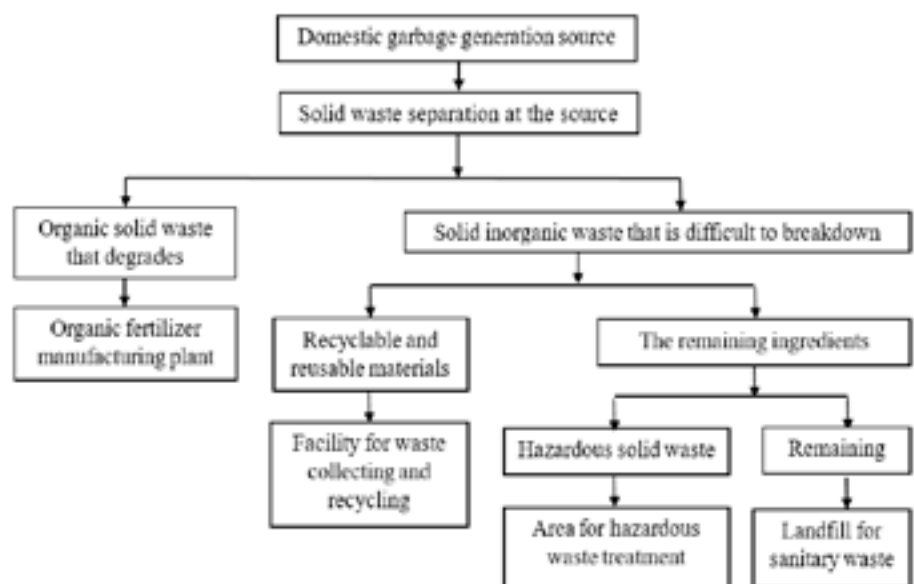


Figure 5. The sequence of classification, collection and treatment of domestic solid waste

damage. natural landscape and reduce pollution of the air, land and water environments caused by exhaust gas, wastewater and garbage.

To establish an acceptable location for a solid waste treatment area, solid waste generated by living quarters and other works must be identified at the source, then collected and delivered to transfer stations located throughout each region and commune. The waste will be preliminarily handled at the transfer station by compacting and sorting each form of recyclable waste, resulting in a source of "clean" biodegradable organic solid waste (food solid waste, food waste, etc.). branches, leaves, wood, paper and so on), no hazardous wastes in everyday life (cleaning chemicals, pesticides, rat poisons, plant protection, etc), the waste is then transferred by mobile vehicle to the Tien Yen solid waste treatment complex in Dong Hai commune to be composted and processed into organic fertilizers, micro-organic fertilizers and high-quality bio-fertilizers.

4.2 Separate and treat solid waste at the source

Solid waste collection and segregation are critical components of solid waste management. Tien Yen district can research and implement a number of specific measures to treat solid waste thoroughly and effectively, including:

- Set a target and aggressively apply it on the collection rate as follows: The household solid waste collection rate is 85%, while the industrial, construction and hospital solid waste collection rates are 95%. Towards forming a model of a circular society, encouraging sorting, 3R (Reduce, Reuse, Recycle) treatment measures and minimizing waste waste, with the long-term goal of applying technology treated by incineration which is now widely used in countries such as

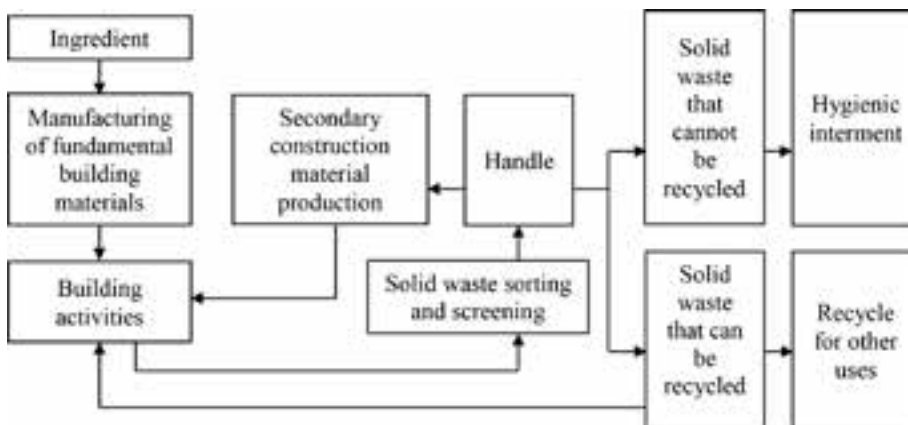


Figure 7. The sequence of construction solid waste classification, collection and treatment

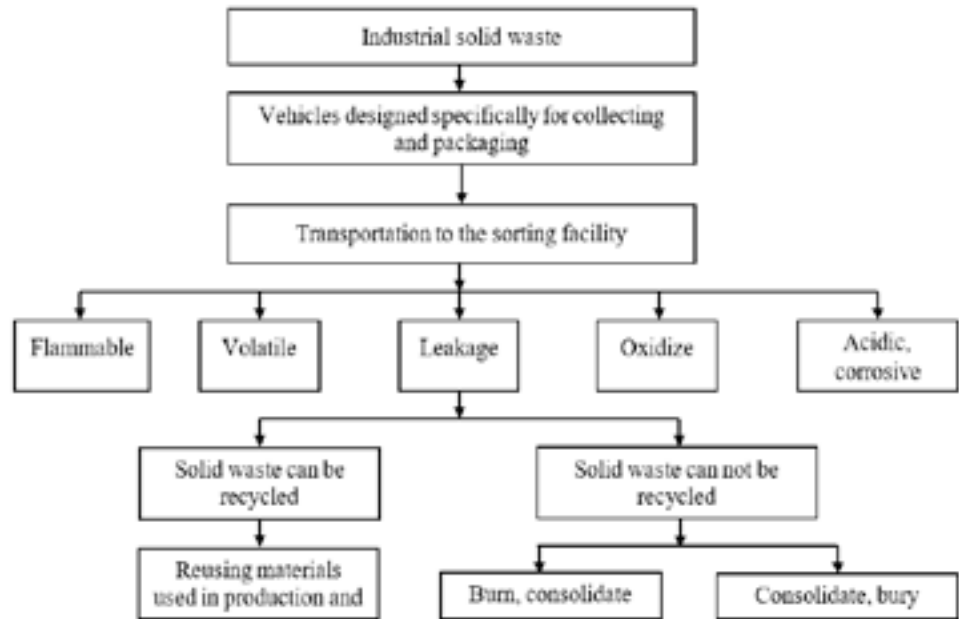


Figure 6. The sequence of industrial solid waste classification, collection and treatment

Japan, Germany, Switzerland, the Netherlands and others.

- In order to treat residential solid waste: Separation of biodegradable organic waste (vegetables, leftovers, etc.) from non-biodegradable inorganic garbage at the source (rubber, plastic, metal, etc.) and be labeled. Increase the efficiency and volume of reuse and recycling processes. Encourage the best possible use of food waste to produce organic fertilizer and animal feed. Raise environmental awareness and contribute to the objective of "sustainable development and green growth."

Improper solid waste disposal results in accumulated waste that becomes a problem for both the environment and the community. Biodegradable materials decay and degrade under unique, unregulated and unhygienic conditions as a result of massive garbage disposal. It becomes a breeding habitat for dangerous insects and infectious organisms after a few days of decomposition. A foul odor is produced, which detracts from the area's aesthetic appeal. As a result, solids collection time management is both required and critical.

To reduce polluting odors, solid waste collection locations should be treated with biological products; decomposing solid waste and hard-to-decompose solid waste are easy to treat.

- For the treatment of industrial solid waste:

- + Solid industrial waste can be recycled and utilized: It will be stored in a separate garbage container before being sold to recycling units or enterprises that need to utilize this waste in the manufacturing process.

- + Solid industrial waste can not be recycled and utilized: These

garbage will be collected and handled at landfills after being collected and stored in separate bins with distinct labels and colors to distinguish them

+ Industrial solid waste that is hazardous: Production facilities contracted with permitted functional units gather the waste, which is subsequently delivered to the combined treatment area for burning in compliance with laws.

- For the treatment of medical solid waste:

+ Medical solid waste in general: To be kept in separate containers and be transferred to a landfill by the household garbage collection unit. Medical solid waste is collected and sent to medical waste treatment clusters in accordance with rules.

+ Medical solid waste that is hazardous: To be treated where hazardous solid waste is generated during the course of living and producing in order to ensure environmental cleanliness and human life safety. In particular, considering the recent problematic developments of the Covid-19 pandemic, medical solid waste disposal should be given top priority and attention. To avoid illness transmission to the community, ensure strict collection, transportation and treatment; Prioritize treatment based on the cluster model of medical facilities and hazardous waste treatment facilities with the role of treating medical waste in the community to ensure the shortest collecting distance from the point of creation to the treatment facility.

- Treatment of construction solid waste: Investors or contractors are responsible for contracting with this unit to collect, sort and transport materials using specialized equipment. Because construction solid waste has a very high reusable composition, classifying it at the source will have significant economic benefits as well as help safeguard the environment for the building sector.

- Treatment of other hazardous solid waste: Set up a centralized hazardous solid waste treatment station to use hazardous solid waste generated during everyday life and production to provide environmental sanitation and safety during the hazardous solid waste treatment process.

- Zones of planned solid waste treatment, Prioritize advanced treatment technology investment projects, can sort and recycle rubbish, compost organic waste and burn hazardous waste in an incinerator, only bury the rubbish that cannot be treated, 15% maximum burial rate. The landfill

must meet environmental sanitation standards and include a leachate collection and treatment system. Incinerators must have exhaust gas treatment systems and operating modes must prevent the production of dioxins and furans.

4.3 Increase the effectiveness of state and local solid waste management policies

Increase the district's application of guidelines and regulations for solid waste classification at the source in urban areas, handicraft zones and craft villages. Improve the organizational structure of the solid waste management system at each level and sector on a continuous basis, focusing on decentralization, explicitly allocating roles and improving the management apparatus at all levels and localities.

Improve the administration of collection locations, transfer stations and solid waste treatment facilities, assist municipalities in conducting a study of collection, classification, transportation, transshipment facilities, dispose of rubbish at authorized solid waste disposal sites. Investigate and implement investment attraction methods, advantageous processes and regulations to encourage active investor interest in the establishment of solid waste treatment zones.

Comprehensive solid waste management legislation in the area; Propagating and rallying individuals to effectively implement the Environmental Protection Act, provide legal incentive mechanisms for solid waste reduction and recycling, to limit solid waste creation and enhance solid waste separation at the source in accordance with rules.

5. Conclusion

One of the primary sources of pollution in the environment is solid waste, specifically, contaminating land, water, air and negatively impacting people's life. As a result, improving solid waste management practices such as prevention, reduction, monitoring, categorization, collection, transportation, reuse, recycling and solid waste treatment is critical. The essay examines the current state of the solid waste management in Tien Yen district (QuangNinh province) as well as its limitations. The deficiencies of solid waste management will be addressed to some extent if some of the aforementioned solutions are successfully implemented, so helping to prevent future adverse effects on the environment and the lives of the inhabitants in the Tien Yen district./.

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