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A study on solid waste management in the industrial area of Chumoukedima

IKOTO YEPTHO

Independent Researcher

Not Applicable

Abstract

One inevitable byproduct of human activity is waste. A rise in the quantity and complexity of waste generated has been attributed to urbanization, economic expansion, and growing living standards in urban areas. Most solid waste disposal occurs by open dumping in the low-lying sections of the town. Environmental pollution results from the open disposal of solid trash near roadways, riverbanks, low-lying areas on the fringes of towns, etc. Finding an appropriate disposal area for the proper disposal of solid waste is necessary. To maximize the vehicle routing system, it is equally crucial to choose a transportation route that takes environmental factors into account when dumping solid trash into landfills from transit stops. The deterioration of air quality and groundwater quality in the Chumoukedima area is caused by industrial activity and the careless disposal of solid waste.

Keywords: Solid waste, Economic, environment, problem

INTRODUCTION

The quality and diversity of trash produced have increased due to the rising living standards of the world's population. Therefore, it is now crucial to manage solid waste to reduce the negative consequences of solid waste. In this regard, it is important to emphasize the three R's: reduce, reuse, and recycle before destroying anything and store waste in a safe location. Wastes might be either organic or inorganic, biodegradable or not, thus classifying them from the source is essential for efficient solid waste management. Wastes from homes, businesses, and other sources—regardless of level—have become an ongoing issue because they keep the environment polluted and degraded. Inadequate waste management practices combined with warm weather lead to a growing number of environmental issues that have a major impact locally and globally. An effective solid waste management system must be developed so that waste management planners and decision-makers can handle the growing complexity,

ambiguity, subjectivity, and multi objectivity of this issue. To prevent the deterioration of the environment caused by dumping in public and to reduce both immediate and long term issues associated about waste management, a suitable landfill site must be selected for the appropriate disposal of solid waste. The process of sanitary landfilling entails several steps, including site selection, planning, construction of the site by the plan, site closure, and environmental monitoring. The most crucial step is choosing the site because it sets the tone for the other steps. While many scavengers still benefit somewhat from insufficient institutional trash management approaches, the government faces significant issues.

RESEARCH OBJECTIVES

The objectives are as follows:

a. To assess the current solid waste management practices and the environmental issues.
b. To suggest a plan for collecting solid trash, including the route between transit stations and the dump, the number of vehicles needed, and their schedule.
c. To recommend the best course of action for Chumoukedima solid waste management.

SOURCES OF SOLID WASTES

Huge amounts of solid waste are dumped at multiple waste sites every day. Homes, workplaces, businesses, and other agriculturally associated undertakings produced this waste. These disposal sites release an unpleasant stench when waste is not managed and stored appropriately. Dumped wastes has the potential to severely harm human health, wildlife health, and the environment by contaminating the air in the vicinity.

The principal sources of solid waste are as follows:

a. Residential: Residential buildings, such as houses and apartments, are one of the primary contributors to solid trash. The trash collected at these locations includes food waste, plastics, paper, glass, leather, cardboard, metals, yard waste, ashes, and special wastes items like electronics, tires, batteries, old mattresses, diapers, and used oil.
b. Industrial: It is widely acknowledged that the industrial sector is one of the primary contributors of solid waste. Construction sites, fabrication facilities, power and chemical plants, and light and heavy industrial enterprises are among them. Solid waste from these industries includes ashes, food and housekeeping wastes, packaging wastes, medical wastes, etc. It also includes materials used in construction and demolition projects.
c. Commercial: Buildings and other commercial establishments are currently another source of solid waste. In this context, "commercial buildings and facilities" include go-downs, stores, restaurants, hotels, markets, and office buildings. Plastics, food wastes, metals, paper, and glass are wastes produced.

d. Institutional: Solid waste is also produced by institutions of higher learning, jails, military barracks, and other government facilities. Common solid wastes collected from these locations include metal, electronics, glass, rubber, plastics, food waste, wood, and paper.
e. Construction site: The solid waste issue is exacerbated by construction projects such as building and road construction, building refurbishment, and road maintenance. These locations create a variety of solid wastes.
f. Biomedical: Hospitals and medical equipment are referred to as "biomedical". Hospitals generate several solid waste products such as syringes, bandages, used gloves, paper, plastics, food waste, chemicals, etc. These must all be disposed of appropriately to avoid causing major issues for both the environment and individuals.

METHODS OF SOLID WASTE COLLECTION AND DISPOSAL IN CHUMOUKEDIMA

Chumoukedima's sources of solid waste generation include homes, marketplaces, bus stops, hotels, restaurants, government buildings, and hospitals. The Town Council works with the Local Administration Department to handle solid waste. The solid garbage is now being disposed of in Khuvanala. At the location, there is no formal garbage disposal procedure in place. Generally, the solid garbage collection trucks from Chumoukedima dispose of the waste in convenient areas. There is no routine monitoring of collection vehicles at the disposal site. There is no systematic planning for the main collection method. Major and minor street inventories are not kept up to date. Rather than according to need, the maintenance schedule and the allocation of specific conservancy labor to certain streets are done on a haphazard basis. In a situation like this, some streets receive more attention than others while some are completely ignored. In a similar vein, the location of dustbins is woefully inadequate. This results in the town's streets and lanes being used for the careless disposal of solid waste. A crucial connection between the locations of waste creation and disposal is the secondary collecting system. It is important to structure the secondary collection arrangements in a way that the garbage collected from the residences is dumped at the appropriate transfer stations, from whence the truck may pick it up and take it to the landfill, guaranteeing a minimum of 90% collection efficiency. Currently, neither residential nor business locations formally separate their recyclable waste. But whether the waste is disposed of in street-based bins or just tossed there, the rag pickers collect the recyclable trash by deconstructing the entire contents of the bins. While rag picking helps the recycling sector, it also ugliness the waste storage area and exposes rag pickers to several health risks.

RESULTS AND DISCUSSIONS

Any industrial or developing civilization must manage its waste, and factors like population growth, public awareness of environmental issues, and governmental policies all have an impact on how waste is generated and disposed of. According to a study, the real issue is not so much the amount of waste generated but the capacity of government employees and waste management companies to manage waste and the environment. In Chumoukedima town, careless trash disposal has resulted in numerous environmental issues, including water

contamination from some inhabitants disposing of their waste in bodies of water, air pollution from dumpsite burning, and blockage of waterways that intensify floods during rainy seasons. Rainwater occasionally can carry trash and street litter into the rivers, contributing to the town's visual pollution. Individuals have an impact on the community when they clean their own homes and leave trash in the immediate area. Biodegradable materials can break down in an unregulated and unsanitary environment due to dumping. This breeds a variety of insects and provides a poultry odor. Additionally, toxic materials could seep into the earth and contaminate it.

Waste Minimisation

Chumoukedima council authorities should implement management reforms to eliminate unsightly places where solid trash has been improperly disposed of or left uncollected. Reducing the amount of rubbish that gets to the drop-off locations would be part of this. The three R's—Reduce, Reuse, and Recycle of Wastes—are becoming important. Source reduction in MSW (Management of Solid Waste) refers to strategies like designing and packaging products to be easily reused, utilizing pre-existing packaging materials instead of creating new ones, extending product life to reduce the frequency of replacement, and creating. Another issue that requires special attention is waste minimization by segregation of recyclable items such as plastics, glass, metals, etc. The recyclables might be delivered directly to recycling facilities, increasing the communities' revenue by generating a specific amount of income.

Collection and Segregation of Waste

Infrastructure, upkeep, and modernization are lacking in the areas of trash collection, transportation, and disposal. The collecting of waste, however, is the weakest link in the waste management cycle. Ensuring that waste is properly separated into its constituent parts and collected separately can undoubtedly result in significant systemic improvements. Providing community trash cans at appropriate distances for the public to dispose of their waste is one of the first steps toward revamping the current structure of the collection services. By doing this, it will be ensured that individuals do not construct open dumpsites by throwing solid garbage on the highways. This will help to preserve the attractiveness of the surrounding area while enabling sanitation workers to move waste to collection trucks swiftly and efficiently with the least amount of health risk.

Separating garbage into components that are biodegradable and non-biodegradable at the source should be the second step. This would be a laborious endeavor because it requires individuals to alter their attitudes and must be implemented gradually and with great planning. Before implementing segregation, the general public must be aware of the necessity and benefits of doing so. Waste must be segregated at the source since hazardous materials such as paints, dyes, batteries, and other materials might react with local solid waste, making it dangerous. Better options and chances for the scientific disposal of trash would result from proper segregation. Penalties should be imposed on offenders of regulations about improper disposal of solid waste and littering. The town council may request that the waste from hotels and restaurants be collected once or twice a day on a cost-recovery basis, or the

association of hotels and restaurants may do so under a contract. The organization or town council may set tariffs and privatize the entire collection and transportation system.

The stores need to keep the garbage produced in the proper containers. Shops that produce recyclable and organic waste must segregate the waste at the source into two different bins. Offices and other institutions will be required to separate the increasing amounts of paper and plastic waste they produce so that it can be collected separately and transported to the recycling industry.

Community Participation

One such activity where public engagement is essential to success is solid waste management. Regardless of the amount of money invested, the local government or town council cannot succeed in SWM without the active engagement of the community. The local bodies which elect members from a limited electorate are the embodiment of grassroots democracy. Additionally, it has a ward-level outreach program that allows readily communicating with the public virtually in all major problems. Therefore, the local government ought to give community involvement significant thought.

Institutional aspects and Capacity Building

Chumoukedima solid waste management (SWM) system has been disregarded which has led to a woefully low and insufficient level of service. The local body or town council must take the necessary steps to strengthen the institution by hiring professionals, delegating authority, developing human resources, and working with the private sector. Administration must be decentralized at the ward, zonal, and city levels. To raise the caliber of services provided in Chumoukedima and enhance the local body's reputation, the administration should make a concentrated effort to instill in its officers and employees a sense of pride in proper waste management.

Financial Structure

When allocating funds, SWM should be prioritized above all other vital services. Currently, several commercial establishments including restaurants, wedding venues, motels, and hotels, charge a set fee. The fee structure ought to be weight-based, with different charges applied based on the establishment's grade and size. Since SWM is a public utility, it is best to administer it on a no-profit, no-loss basis. The combined bills for the town council's services such as the supply of water and electricity should be increased to collect solid waste user charge. Varying categories of offenders should have varying additional cleaning charge amounts, with repeat offenders receiving greater charges. Protecting public health, enhancing environmental quality, fostering sustainability, and bolstering economic output are the main goals of SWM. In order to achieve these objectives, local governments must fully embrace sustainable solid waste management systems and work with the public and commercial sectors to implement them.

SUGGESTIONS

a. Educate the public about environmental issues by teaching them about the need to sort waste at home, in schools, workplaces, and universities, as well as the consequences of their activities.
b. Recyclables should be collected, and residents should be given dry and wet dust bins to encourage them.
c. Engage the community by conducting weekly sanitation exercises within and around the community
d. Conduct of awareness campaigns in Chumoukedima town.

CONCLUSION

The groundwater and air quality were used to evaluate the environmental issues associated with the dumpsites located in Chumoukedima town. Burning materials release polychlorinated biphenyls and dioxin, which can lead to several diseases, including cancer. Place a strong emphasis on the three R's: reduce, reuse, and recycle before destroying anything and storing garbage safely. Reducing, reusing, and recycling helps to save resources such as money, energy, raw materials, land, and pollution. To reduce the effects of solid waste and stop the spread of disease, one need to raise awareness about solid waste management. There is a garbage mountain and threat due to agencies' inadequate waste disposal systems. People trash their surrounding which impact the community and environment, even as they clean their houses and places of employment.

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