

Operation of solid waste in intermunicipal sanitary landfills in the province of Cañete - Region Lima, 2018

Bessy Castillo Santa María^{a, *}, Rubén Andrés Moreno Sotomayor^a

^aUniversidad Nacional de Cañete, Peru.
bcastillosm@hotmail.com

Resumen

El presente trabajo de investigación, tiene como objetivo determinar la relación que existe entre la operación de los residuos sólidos en rellenos sanitarios intermunicipales de la provincia de Cañete - Región Lima, 2018. A fin de plantear herramientas para su implementación y evitar la contaminación que viene ocasionando en los diferentes distritos de la provincia. Se empleó el enfoque cuantitativo, diseño no experimental, tipo correlacional, mediante la técnica de encuesta y como instrumento el cuestionario, una población de 120 personas, 20 por distrito de Cerro Azul, Nuevo Imperial y Quilmana. En el resultado no existen correlación significativa entre la variable relleno sanitario y residuos sólidos, ya que la significancia 0,05 es menor que a 0,59 por tanto no es significativa y el coeficiente de correlación Pearson ($r=,050$) nos indica que existe una relación moderada entre ambas variables. Se concluye la existencia moderada entre las variables relleno sanitarios y residuos sólidos intermunicipal de la provincia de Cañete 2018, refleja el poco interés en propiciar cambios de conducta entre autoridades de los diferentes distritos enfocados la investigación, provocando la vulnerabilidad por carecer de rellenos sanitario formales y sostenibles

Palabras clave: Relleno sanitario, residuos sólidos, contaminación, vulnerabilidad.

Abstract

The objective of this research work is to determine the relationship between the operation of solid waste in intermunicipal sanitary landfills in the province of Cañete - Lima Region, 2018. In order to propose tools for its implementation and avoid the pollution that has been causing in the different districts of the province. The quantitative approach, non-experimental design, correlational type, was used through the survey technique and as an instrument the questionnaire, a population of 120 people, 20 per district of Cerro Azul, Nuevo Imperial and Quilmana. In the result there is no significant correlation between the sanitary landfill variable and solid waste, since the significance 0.05 is less than 0.59, therefore it is not significant and the correlation coefficient Pearson ($r=,050$) indicates that there is a moderate relationship between both variables. The moderate existence between the variables sanitary landfill and intermunicipal solid waste of the province of Cañete 2018 is concluded, it reflects the little interest in propitiating changes of behavior between authorities of the different districts focused on the investigation, provoking the vulnerability due to the lack of formal and sustainable sanitary landfills.

Keywords: Landfill, solid waste, pollution and vulnerability.

1. Introduction

Solid waste management is a common problem in most cities in the country, due to various factors such as population growth, the increasing amount of waste generated by the population, poor education and community participation among others. Paper being the main waste generated and

organic waste is the second place with greater generation and evidence of a reduction in its quantity (Rojas and Bogantes, 2018).

Lack of cleanliness of public areas, existence of dumps, leads to the reproduction of vectors transmitting diseases, generation of bad odors and landscape deterioration affecting the environment. And the use of organic solid waste can reduce emissions of tons of CO₂ emitted into the atmosphere, based on the economic principle of utility that determines environmental viability and sustainability in plants using organic solid waste. (Castañeda and Rodriguez, 2017)

The recovery of solid waste is 78% usable and not sent directly to final disposal, this allows to lengthen the useful life of waste disposal sites (Araiza et al, 2017) and the lack of Management in Solid Waste Management and the alarming growth of this, in cities generates environmental pollution, and open-pit dumps or garbage dumps pollute the surrounding areas, putting serious risks to public health. This problem focuses on entire families, children, the elderly and the destitute who work as informal segregation agents in garbage dumps or in the garbage bags left by the neighbors of a certain area, without the basic protections necessary for this work, being exposed to various diseases. The growing generation of solid waste and the loss of the potential for its use are identified as fundamental aspects of environmental problems (Lara and Velasquez (2016) and is a pending task in the challenge of waste management, implies deficit in infrastructure (Jimenez, 2015).

A weakened municipal policy and the State, has no perception regarding its competences that corresponds to it according to the normativity, agreeing that the three groups of actors of the Community are mainly the cause of the origin of the problem (Niño et al, 2017).

The solid waste from the informal dumps is a concern of the society that lives in the nearby areas for the incidence of diseases, generating environmental vulnerability. Therefore, solid waste constitutes one of the major concerns of contemporary societies and a global challenge for environmental management (Severiche et al, 2014).

Article 3 of Minam (2000) indicates that the purpose of solid waste management in the country is integral and sustainable management, through the articulation, integration and sharing of policies, plans, programs, strategies and actions of those who intervene in the management and handling of solid waste. Thus, the existing dump in the province of Cañete is contaminating the area where it is located. What is the relationship between solid waste and intermunicipal sanitary landfills in the province of Cañete - Lima Region, 2018?

2. Materials and Methods

The research work focuses on the province of Cañete, in the Lima region, which does not have a sanitary landfill for solid waste treatment, and in each district the health of the population is being harmed by informal dumps. The methodology used in the research is quantitative, not correlational. Whose population is made up of:

Table 1: Distribution of the population

N°	Distrit	Population	amount
1	Cerro Azul	5010	55
2	Nuevo Imperial	4150	50
3	Quilmana	4520	69
	Total	13680	174

Obtaining the sample size:

$$n = \frac{z^2 p.q .N}{e^2(N-1) + z^2 p.q} \quad n = \frac{(1.96)^2(0.5)(0.5)x(174)}{0.05^2(174-1)+1.96^2(0.5)(0.5)} \quad n = \frac{167}{1.3929} = 119.8 = 120$$

Table 2. Distribution of the population sample size

N°	Distrit	Population	Fh	Stratified Sample
1	Cerro Azul	55	0.316	38
2	Nuevo Imperial	50	0.287	34
3	Quilmana	69	0.396	48
	Total	174		120

3. Results

Description of solid waste and landfill levels.

In Table 3, it is noted that out of 100 % of people surveyed, 5 % think that solid waste collection is deficient, 81.7% report that it is regular and 13.3 consider that it is efficient, reflecting in the population that there is regular interest in solid waste. And it coincides with the research of (Severiche, Acevedo, & Jaimes, 2014) where they state that solid waste is one of the major concerns of contemporary societies.

Table 3. Solid waste level

		Frequency	Percentage
Valid	Deficient	6	5,0
	Regular	98	81,7
	Efficient	16	13,3
	Total	120	100,0

In table 4, it is noted that out of 100 % of people surveyed 19.2% think that the distribution of landfill level is deficient, 66.7% report that it is regular and 14.2% consider that it is efficient.

Table 4. Distribution of landfill levels

		Frequency	Percentage
Valid	Deficient	23	19,2
	Regular	80	66,7
	Efficient	17	14,2
	Total	120	100,0

There is no significant correlation between the landfill variable and solid waste, since the significance 0.05 is less than 0.59, therefore it is not significant and the Pearson correlation coefficient ($r=,050$) indicates that there is a moderate relationship between both variables. In this respect the research carried out by (Castañeda and Rodriguez, 2017) reports the importance of the use of organic solid waste allows to reduce the emissions of tons of CO₂ emitted to the atmosphere, based on the economic principle of utility that determines the environmental feasibility and sustainability in plants using organic solid waste.

Table 5: Correlation between landfill and solid waste

	Sanitary Landfill	Residues Solids
Sanitary Landfill	Pearson Correlation	1
	Sig. (bilateral)	,050
	N	120
Residues Solids	Pearson Correlation	,050
	Sig. (bilateral)	,591
	N	120

4. Conclusions

A moderate correlation has been found between the variables sanitary landfill and intermunicipal solid waste in the province of Cañete 2018, which reflects the lack of interest in propitiating changes in behavior among the authorities of the different districts focused on research.

There is a weak interest on the part of the authorities in managing landfills that generate income through a treatment plant.

Vulnerability increases due to the contamination of solid waste due to the lack of sanitary landfills. And this in turn by effect of informality, being in these dumps where the burning of waste occurs, which directly affects the ecology and health of people.

Acknowledgements

We gratefully acknowledge to Bach. In Civil Engineer: Escalante France, Deny Miki; Félix Medrano, Yosehana Melanie; Luyo Ramos, Isabel Marcelina; Cuzcano Barreto, Carlos William and Rivera Miranda, Ronald, for their support in developing the survey.

References

- Araiza J. A., Chavez J. C., Moreno J. A. 2017. Quantification of solid urban waste generated in the municipality of Berriozábal, Chiapas, Mexico. 9. DOI: 10.20937/RICA.2017.33.04.12
- Castañeda S., Rodriguez J. P. 2017. Modelo de aprovechamiento sustentable de residuos sólidos orgánicos en Cundinamarca, Colombia. doi:<http://dx.doi.org/10.22267/rus.171901.75>
- Jimenez N. M. 2015. Integral management of solid urban waste in Mexico: between intention and reality. Letras verdes. doi:<https://doi.org/10.17141/letrasverdes.17.2015.1419>
- Lara D., Velasquez L. F. 2016. Proposal for the management of solid waste generated in the market square of the urban casoco of the municipality of Mesa Cundinamarca. Bogota: Universidad Libre.
- Minam. 2000. General Law of Solid Waste. Law No. 27314. Sinia. Available in: <http://sinia.minam.gob.pe/download/file/fid/37508>

- Niño A. M., Trujillo J. M., Niño A. P. (January - June 2017). Management of solid household waste in the city of Villavicencio. A view from the interest groups: Company, State and Community. *Blue Moon* (44). DOI: 10.17151/luaz.2017.44.11
- Rojas Vargas, J., & Bogantes, J. 2018. Quantification and characterization of the ordinary solid waste of the National University of Costa Rica, disposed in sanitary landfills. *UNICIENCIA*, 32(57 - 69). doi:<https://doi.org/10.15359/ru.32-2.4>
- Severiche Carlos, Acevedo Rosa, Jaimes Jose. 2014, Producción + Limpia. *Rev. P+L* [online]. vol.9, n.1, pp.115-123. ISSN 1909-0455. Available in: http://www.scielo.org.co/scielo.php?pid=S1909-04552014000100009&script=sci_abstract&lng=es