

## Municipal Intervention For The Segregation Of Polluting And Domestic Waste In The San Pedro De Cachora District-Abancay-2021

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### Abstract:

*The study addresses the need to propose a management model for the Municipality of the San Pedro de Cachora District, located at the main access point to the Choquequirao archaeological park in Peru. The article, titled 'Municipal Intervention for the Segregation of Contaminating and Domestic Waste in the San Pedro de Cachora District-Abancay-2021', is based on the premise that the final disposal of waste is a significant concern in Latin America, compounded by the ongoing pandemic. The general objective is to implement a solid waste management system in urban and rural areas, considering the socio-cultural context of the study object and adhering to national regulations focused on environmental care. The lack of municipal management in waste handling poses a factual threat to public health. The scope of the study focuses on the San Pedro de Cachora District, which serves as the main route to the Choquequirao Archaeological Complex, where tourism is one of the primary economic activities. It has been observed that there is currently no authorized sanitary landfill, and waste collected by the municipality is either dumped in an improvised landfill or incinerated, negatively impacting the environment, residents' health, and national and foreign tourists. A search for updated literature is required to enhance waste generation, segregation, classification, and final disposal processes in harmony with the environment and to reduce risks to public health.*

**Keywords:** Waste, solid waste, municipal-management, waste, environment.

### Introduction.-

Final disposal in most countries regarding waste treatment and environmental control has been carried out in precarious and anti-technical conditions. Very few countries in Latin America took this problem seriously by building treatment plants that comply with established and certified technical characteristics for operation, with emphasis on environmental conservation, as well as health sustainability according to the regulations stipulated by the Pan American Health Organization.

The criteria and indicators make it possible to assess the environmental impact with sustainable development strategies. The Municipalities lead the process of final destination of urban and rural solid waste (RSUR), through sanitary landfills, avoiding a negative impact on the environment, affecting sustainable development. (Machorro-Román, A., Rosano-Ortega, G., Tavera-Cortés, Martínez-Gallegos, S., Rodríguez-Espinosa, PF 2020)

In 2002, it was estimated that municipal solid waste was generated nationwide at 12,986 tons per day, equivalent to 4.74 million tons per year; of this total, only 73.7% was collected by municipal services and only 19.7% of the total was disposed of in sanitary landfills.

Ministry of the Environment (2016) National Plan for Integrated Solid Waste Management, <https://sinia.minam.gob.pe>

As an additional problem, currently the waste generated due to the pandemic such as masks, gloves, medicines, can be mixed with common waste, which must be separated and classified differently and collected in the same way by municipal servants, another factor that adds is the increase in demand for the use of disposable utensils due to the issue of contagion in the health situation that increases The accumulation of waste that directly threatens the environment, ignored by government regulations, has exponentially increased. The main phase is the final destination and they must be transported to a duly authorized sanitary landfill implemented with infrastructure, equipment and trained personnel that allow the solid waste to be disposed of in a safe, environmental and sanitary manner, guaranteeing the health of the population. (Barrios, H. 2021)

The general objective is to propose strategies, design a management tool and implement an acceptable system in the treatment of solid waste in the urban and rural areas according to the socio-cultural and economic problems of the District of San Pedro de Cachora, according to the guidelines of national regulations with emphasis on the care of the environment and public health. framed in the Fundamentals of the National Environmental Policy and General Law of Solid Waste, which will strengthen the process and logistics of solid waste management at the level of local government with regional and national significance, creating guidelines oriented to education, training for an efficient and effective sustainable development over time with the continuous improvements that are established according to the change of needs and priorities as the case warrants. The capacities of authorities and operational personnel will be strengthened for the sustainable management of polluting solid waste and common waste; Ministry of the Environment (2016) General Law on Solid Waste, <https://sinia.minam.gob.pe>

The increase in urban and rural solid waste (RSUR) puts at risk the health of the inhabitants of the District under study and the environment due to its toxicity, mutative genetic activity and carcinogenicity. The continuous increase in RSUR, together with the strict regulations, makes it possible to eliminate waste through the process of collection, classification and final destination of waste, and it must be considered within the strategic activities with effectiveness, efficiency and economic responsibility. (Zhu, Y., Zhang, Y., Luo, D., (...), Li, E., Kong, X, 2021)

**Material and Methods.**-A search and systematic review of recently published articles related to the research topic was carried out, considering that new and scarce information was identified within the proposed variables of solid waste generated in the pandemic, which will allow updating and expanding the knowledge between the waste management association and the health risk of the population identified in the scope of study. (Scientific Electronic Library Online., (2010) Practical Guide to Publishing Articles in Journals, <https://www.scielo.org>; Publish your articles - Revista Científica (2020); [www.masscience.com](http://www.masscience.com), Basic Guide to Publishing Articles in Research Journals (2013) <https://www.udec.edu.mx>

**Search criteria.**-It has been considered to work in a sequential and orderly manner, identifying three phases of search, Planning, Review and documentation, as well as the search criteria, filters of broad criteria helping them to get closer to the object of study, in this case the search platform of SCOPUS, EBSCO and Google Scholar (we consider time as a limitation).

**Planning phase.**-In this phase we identify the keywords and search protocols that will allow us to create the search chain, generating scientific and academic information that is related to the topic of study, considering articles, journals and other types of bibliography. It is also important to find patents or citations, although it is true that we cannot download, but it is an option that allows us to know more details of the contents of the research work.

In the elaboration of the search chain, keywords were determined based on basic guidelines established in the title of the research and others directly linked to the problem; as established, Boolean connectors were used that allow the logical articulation of related words to give a common sense to the search, as similar alternatives using OR and AND. or exclusionary ones such as NOT. TITLE-ABS-KEY ( solids AND waste AND treatment ) OR ( LIMIT-TO ( "ALLI" ) ) AND ( LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2021 ) , 2019 ) OR LIMIT A ( PUBYEAR , 2018 ) ) AND ( LIMIT. ) . (Scientific Electronic Library Online., (2010) Practical Guide to Publishing Articles in Journals, <https://www.scielo.org>; Publish your articles - Revista Científica (2020); [www.masscience.com](http://www.masscience.com), Basic Guide to Publishing Articles in Research Journals (2013) [ttps://www.udec.edu.mx](https://www.udec.edu.mx)

The sources of information were identified in two recognized and important platforms or databases in the academic field, such as SCOPUS as part of the University's virtual library, SCOPUS, EBSCO and Google Scholar, taking into consideration their ease of access.

The search process was carried out with all the criteria indicated in the system menu, using filters to reduce information as well as the date range of last 04 years, field of study "Social Sciences" and environment, articles in English and Spanish, university institutions, research articles published in journals.

**Results.-** SCOPUS, initially a universe of 1544 results was found, of which 1542 in English and 02 in Spanish, later the search filters based on 2020 and 2021 publications were readjusted, considering that the covid-19 pandemic is recent, obtaining a result of 189 publications. In EBSCO and Google Scholar with a result of more than 30000 approximately to the phrase "Municipal management in waste management".

Subsequently, the articles of interest that most resemble or have similar content to the object of study of the research were classified, considerably reducing the range of classification and study.

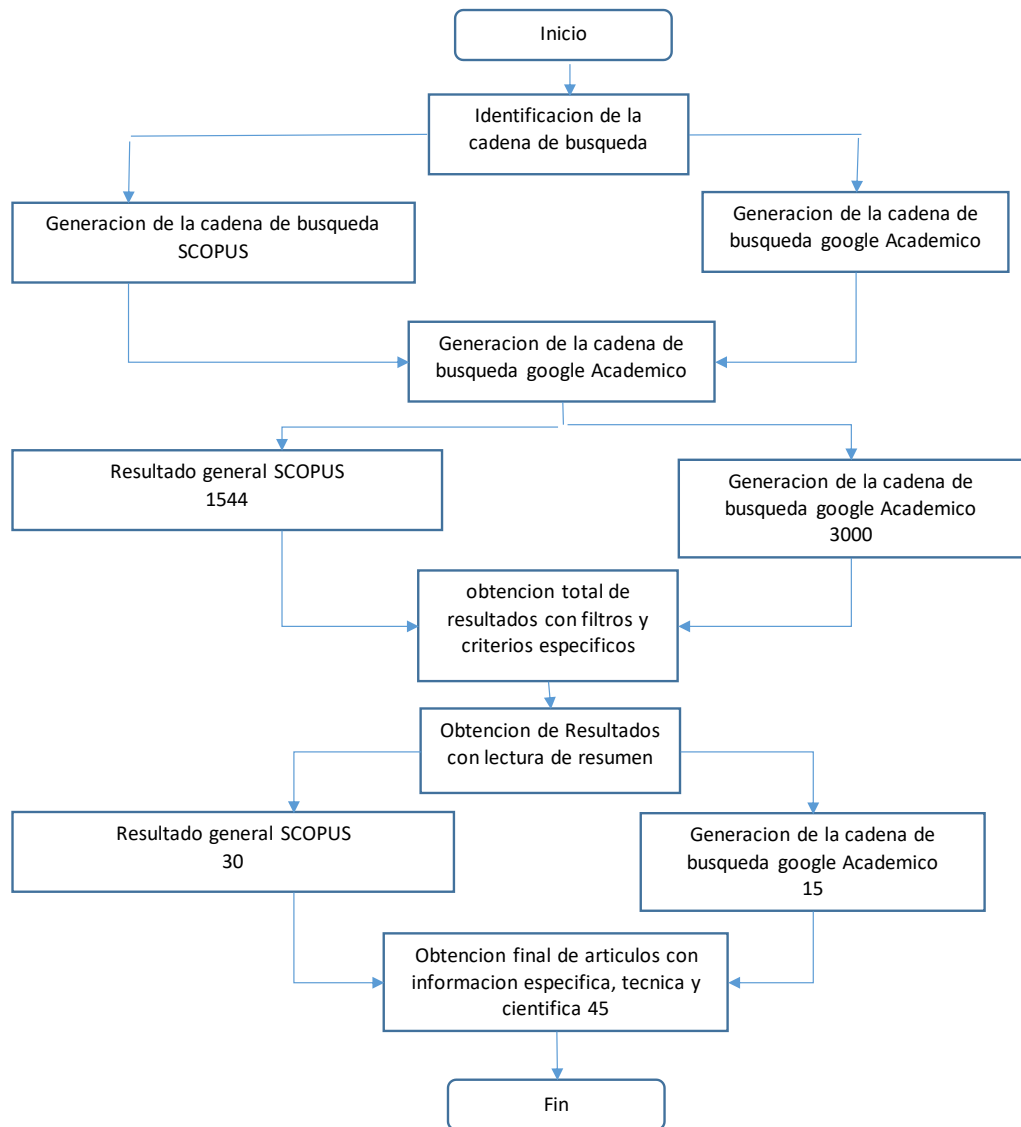
In the final phase of identifying results, the abstracts of the articles with characteristics in common with the search string were manually reviewed and quickly read.

**Documentation.-**In this phase we will focus on establishing the final results that meet the search requirements, the important content in the contribution of ideas, conclusions for the article and subsequently improve the research process of the topic raised. Increase the final bibliography.

A flowchart of processes is made to analyze the search procedure and final result:

(Scientific Electronic Library Online., (2010) Practical Guide to Publishing Articles in Journals, <https://www.scielo.org>; Publish your articles - Revista Científica (2020); [www.masscience.com](http://www.masscience.com), Basic Guide to Publishing Articles in Research Journals (2013) [ttps://www.udec.edu.mx](https://www.udec.edu.mx)

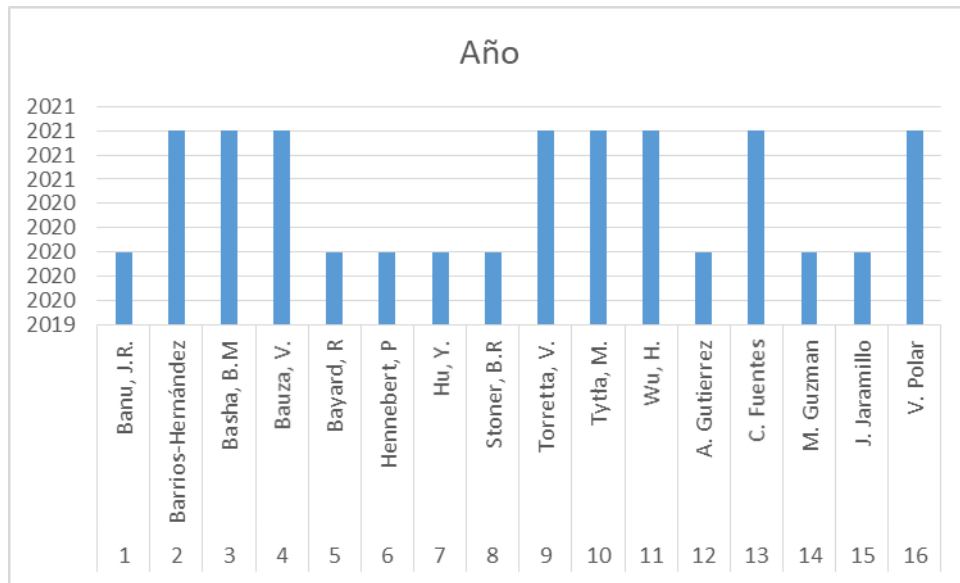
Figure No. 001. Search Strategies.



**Table 1** Results of Publications Systematic search. In original language: Spanish



**Figure 02 Statistics on publications by year**



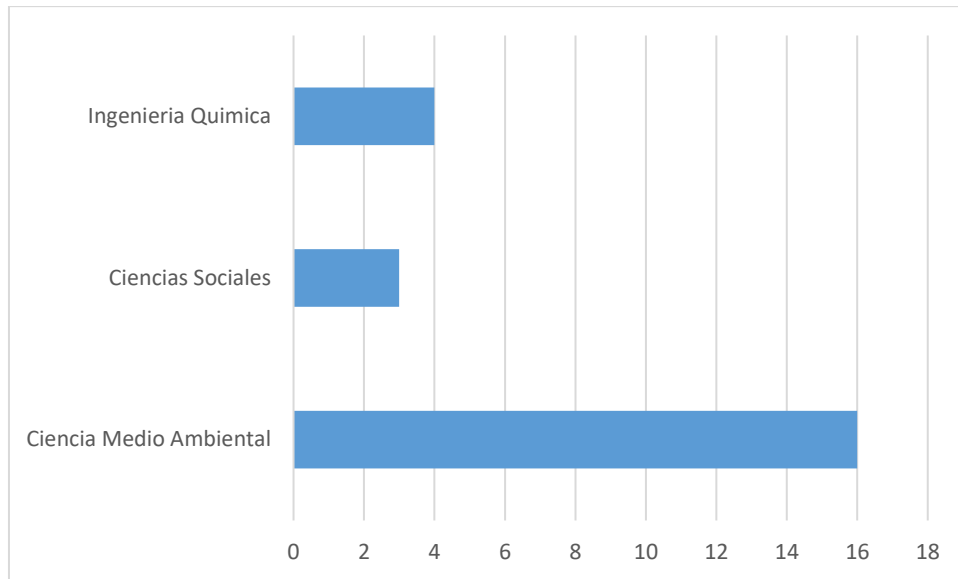
**Table No. 02.** In original language: Spanish

Results of Publications Thematic Area.

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N°	Título	Autor	Año	Arte Tematico
1	Incineration", "11", "Unit 22", "1", "Government of the United Kingdom", "1", ".....	Banu, J.R.	2020	Ciencia Medio Ambiental
2	andemic", "11", "BIOENTECH Company	Barrios-Hernández	2021	Ciencias Sociales
3	Generation Regulatory Authority	Basha, B.M	2021	Ingeniería Química
4	Sludge Treatment	Bauza, V.	2021	Ingeniería Química
5	Surface Water	Bayard, R	2020	Ciencia Medio Ambiental
6	Waste Water Management	Hennebert, P	2020	Ciencia Medio Ambiental
7	Waste Water Treatment Plant	Hu, Y.	2020	Ingeniería Química
8	Recycling	Stoner, B.R	2020	Ciencia Medio Ambiental
9	Environmental Impact	Torretta, V.	2021	Ciencias Sociales
10	Water Treatmen	Tytlá, M.	2021	Ciencias Sociales
11	Wastewater Treatment Plant	Wu, H.	2021	Ingeniería Química
12	Gestión municipal y manejo de residuos sólidos domiciliarios	A. Gutierrez	2020	Ciencia Medio Ambiental
13	Gestión de residuos sólidos municipales	C. Fuentes	2021	Ciencia Medio Ambiental
14	El manejo de los residuos sólidos municipales: un enfoque antropológico. El caso de San Luis Potosí, México	M. Guzman	2020	Ciencia Medio Ambiental
15	Gestión integral de residuos sólidos municipales-GIRSM	J. Jaramillo	2020	Ciencia Medio Ambiental
16	La gestión municipal de residuos plásticos y su influencia en la satisfacción de la población del distrito de Characato, Arequipa, 2017	V. Polar	2021	Ciencia Medio Ambiental
17	Contaminación de aguas superficiales por residuos en Venezuela y otros países de América Latina	Benítez-Díaz, P. , Miranda-Contreras	2013	Ciencia Medio Ambiental
18	Una revisión de los residuos sólidos urbanos en China: características, composiciones, factores influyentes y tecnologías de tratamiento	Zhu, Y. , Zhang, Y. , Luo, D. , (...), Li, E. , Kong, X.	2021	Ciencia Medio Ambiental
19	Residuos sólidos peligrosos confinados en botadero cerrado de morelia: un pasivo ambiental urgente a atender en países en desarrollo	Gonzalez-Arqueros, ML , Domínguez-Vázquez, G. , Alfaro-	2021	Ciencia Medio Ambiental
20	Modelado de un relleno sanitario para países en desarrollo para mejorar la confiabilidad de los estudios de Evaluación del Ciclo de Vida	Gutierrez, KG , Fernandes, MAO , Chernicharo, CAL	2019	Ciencia Medio Ambiental
21	Gestión de residuos sólidos urbanos desde la experiencia de São Leopoldo / Brasil y Zurich / Suiza	Ghesla, PL , Gomes, LP , Caetano, MO , Miranda, LA , Dai-Prá, LB	2018	Ciencia Medio Ambiental
22	Residuos sólidos peligrosos confinados en botadero cerrado de morelia: un pasivo ambiental urgente a atender en países en desarrollo	Gonzalez-Arqueros, ML , Domínguez-Vázquez, G. , Alfaro-Cuevas-	2021	Ciencia Medio Ambiental
23	Experiencia de participación comunitaria en la adecuación del manejo de residuos sólidos urbanos en México	, Bolaños, RR , Hernández, U.Á. , (...), Siller, ST ,	2015	Ciencia Medio Ambiental

Figure N° 03 Statistics by Thematic Area. In original language: Spanish



In the final summary, it can be seen in figure N° 03 the search statistics by Thematic area, concluding that: 10 corresponds to the area of Environmental Science, 03 to Social Sciences and 04 to Chemical Engineering, therefore the largest amount of information is related to environmental protection as a social problem.

The search result focuses on criteria and techniques analysis, based on the Research topic. Considering that the topic is topical due to the topic of pandemic, it was concretized in the search of the last 03 years 2019, 2020 and 2021, with publications that resemble the research topic and that will serve as a great contribution to the scientific article in execution with the following publication result, also considering authors with criteria concordant with the research topic:



Table 03. Variables. In original language: Spanish

VARIABLE	DIMENSIONES	AUTOR A	AUTOR B	AUTOR C	AUTOR D	AUTOR E	DISCUSION	CONCLUSION	
GENERACION DE DESPERDICIOS	RESIDUOS SOLIDOS	Rodriguez, J	Polar, V. (2020)	Banu J.R.(2020)	Gutierrez, A	Hu Y. (2019)	Residuos sólidos y su incidencia en la contaminación ambiental en la comunidad de Lircay, provincia de Angaraes, Huncavelica	El presente estudio se enmarca en los Fundamentos de la Política Nacional del Ambiente y Ley General de Residuos Sólidos, que permitirá fortalecer el proceso y logística de la gestión de residuos sólidos a Nivel de los gobiernos locales y regionales con trascendencia nacional; creando lineamiento orientados a la educación, capacitación para un desenvolvimiento eficiente y eficaz que además sea sostenible en el tiempo con las mejoras continuas que se establezca según el cambio de necesidades y prioridades como el caso amerite, como el estado de emergencia por la pandemia de Covid-19, que tuvimos que reinventarnos en todos los aspectos económicos, políticos y de salubridad;	
							La identificación de residuos sólidos se ha realizado en 03 localidades con diferentes ingresos económicos, los residuos se recolectaron durante un periodo de 01 año, en el cual se ha obtenido mayor cantidad de residuos orgánicos con un 48%, seguido de		
							En el presente libro se puede encontrar los paradigmas sobre manejo de residuos sólidos en América Latina, en los últimos 30 años hemos tenido un cambio drástico en el sistema de vida rutinaria a consecuencias de políticas		
							El trabajo planteado en base a un proceso de investigación asume la Hipótesis General planteada, en el cual se puede demostrar que los desechos sólidos determinan drásticamente en la contaminación del medio ambiente en la localidad de Lircay, Huancavelica, con niveles altos, indicando una dependencia arraigada entre dos variables principales		
	CONTAMINACION DE AGUA Y MEDIO AMBIENTE	Ohoa, M (2020)	Aliaga, W. (2020)	Rodriguez, J	Meendez, M.(2009)				El trabajo planteado en base a un proceso de investigación asume la Hipótesis General planteada, en el cual se puede demostrar que los desechos sólidos determinan drásticamente en la contaminación del medio ambiente
									La gestión de los residuos sólidos en los municipios es un aspecto importante para la protección de la salud y el medioambiente
									Ginebra, 24 de marzo de 2020.- Los gobiernos deben considerar la gestión de residuos un servicio público urgente y esencial en el marco de la pandemia del COVID-19 con el fin de minimizar posibles impactos secundarios sobre la salud y el
									Es un contexto amplio de inclusión y participación, la investigación ambiental se constituye un gran reto para conocer nuestro entorno físico-biótico
						La integración del medio ambiente a las estrategias empresariales del sector turismo es fundamental; el desarrollo sostenible incide significativamente con la contaminación por residuos sólidos en el sector turismo que implica un adecuado equilibrio de aspectos ambientales, económicos y sociales; educación tiene un papel importante para enfrentar los retos ambientales"			

### Discussion:

**Focus of the development of the topic.-** From the review and analysis of the systematic search, it has been possible to evidence examples of socio-environmental, academic, and scientific practices in different countries of Latin America and the world with various procedures of execution with efficiency and in many cases limitations that prevent reaching an adequate procedure linked to the health standards that demand the quality of the service with repercussions on the health of citizens and the environment. environment with emphasis on the socio-cultural and geographical environment, which necessarily leads us to a qualitative and quantitative study.

Therefore, this article allows us to carry out the analysis with orderly and progressive approaches according to the origin of the conception of the problem.

The Pan American Health Organization states in its technical report that the final destination of waste is one of the most critical aspects in Latin America. The final disposal and environmental control has been carried out in precarious and anti-technical conditions. Very few municipalities in Peru consider the problem of garbage seriously, this tendency is ignored by the central government and control institutions that do not have the technical and logistical capacity to carry out the adequate and existing control in compliance with

existing regulations and directives to guarantee the technical handling and final destination of waste that in its bad practice threatens the environment. V. Polar (2021).

Currently, according to statistics carried out by the Ministry of the Environment, it was determined that the segregation of domestic waste in Peru in 2020 was 12.97 tons per day, which is equivalent to 7.73 million tons per year, of this only 73% are collected by municipal management and only 19% are referred to authorized and guaranteed dumps. Much of the waste collected is dumped in common dumps in public spaces, increasing the risk of health.

MINAM. (2020). National Plan for Integrated Solid Waste Management. 2020, file:///C:/Users/Usuario/Downloads/plan\_nacional\_rrss%20(1).pdf

The main phase is the final destination and they must be transported to a duly authorized sanitary landfill implemented with infrastructure, equipment and trained personnel that allow the solid waste to be disposed of in a safe, environmental and sanitary manner, guaranteeing the health of the population. Banu, J.R. (2020); J. Jaramillo (2020); González-Arqueros, M.L., Domínguez-Vázquez, G., Alfaro-Cuevas-Villanueva, R., Israde-Alcántara, I., Buenrostro-Delgado, O. (2021).

**Triangulation:** For the present research and analysis work, we will consider the triangulation method for the discussion study, considering the keywords that have been recurrent in the field of systematic search, so it has been possible to identify some specific ones for discussion and analysis, such as the authors' points of view and subsequent concatenated conclusion.

#### **HEALTH RISK:**

(A. Gutierrez 2020) "Municipal Management and Household Solid Waste Management",

They state that waste management represents a threat to public health if it is not managed responsibly, consequently, the importance of carrying out an epidemiological report on waste management practices and the health risks that this would cause to the inhabitants and residents of the place or area of application of the study.

Studies published from January 2005 to 2020 following the guidelines of PRISMA MSW, treatment sites or final waste disposal sites were considered, finding as synonyms landfills, incineration equipment, open air waste burning, transfer station, recycling places, among others; Occupational diseases that are directly involved in the collection and final destination process were not considered; The study focuses in a general way on the population, determining the risks found, which were, respiratory infections, skin diseases, vector-borne diseases, cancer, gastrointestinal diseases due to consumption of contaminated water, among others, with greater incidence in the proximity of landfills; There is still a lot of research pending, for example, birth defects, which will be a more thorough and scientific work.

#### **COLLECTION AND SORTING MANAGEMENT.**

(Benítez-Díaz, P., Miranda-Contreras, L., 2019) International Journal of Environmental Pollution, manifests. The existence of wastes for agricultural use, such as fungicides, herbicides, among others considered carcinogenic, are disposed of in streams or springs, being detected in high concentrations, exceeding the limits established by the WHO and local health institutions such as the MINSA, also reporting other polluting substances such as minerals harmful to health, prohibited elements, establishing themselves as unfit for human consumption. These sources also cause harm to animals, acquiring intestinal diseases such as fasciola, among others, which could generate contagion through meat or organ meats, which are frequently consumed in the population.

(Zhu, Y., Zhang, Y., Luo, D., (...), Li, E., Kong, X., 2021) Environment, Development and Sustainability. Solid waste (MSW) seriously threatens human health and the ecological environment due to its toxicity, mutagenic activity, and carcinogenicity. The continued increase in MSW along with strict regulations. Waste sorting and recycling has been recognized as an efficient and economical treatment strategy. By analyzing research data from 31 provinces between 2000 and 2017, the overall objective of this work was to determine the characterizations and compositions of MSW in Latin America, then to provide tips for the classification, transport, storage, and disposal of MSW.

#### **FINAL DESTINATION:**

(González-Arqueros, M.L., Domínguez-Vázquez, G., Alfaro-Cuevas-Villanueva, R., Israde-Alcántara, I., Buenrostro-Delgado, O. 2021).

In developing countries, municipal solid waste (MSW) landfills are a major source of pollution. The contamination is mainly due to poor location of design, operation and lack of lining, which allows the dispersion of the pollutants, this study provides evidence on the habitual and illegal practice of landfills and the lack of competent legislation on the matter. This information is essential to establish precedents for improving laws and assisting decision-making authorities in territorial planning to improve public and environmental health.

(Gutierrez, KG, Fernandes, MAO, Chernicharo, CAL, 2019), Earth and Environmental Sciences.

As a result of the existing reality, the objective of this study was to design a management tool that corresponds to the case of these countries and provides a methodology to improve the significance of environmental studies, which can also be used with primary data. The model used data from the literature based on the Brazilian reality, considering the operation of the landfill (transport and emissions and use of waste spreading); biogas generation and treatment; Generation and treatment of leachate through stabilization lagoons and their emissions.

(Ghesla, P.L., Gomes, L.P., Caetano, M.O., Miranda, L.A., Dai-Prá, LB, 2018)

#### **Sustainability**

The challenge of governments in developing countries in solid waste management (MSW) is complex, often ineffective and does not meet the required technical sustainability, which involves environmental, social and financial aspects.

(Carmona, AR, Bolaños, RR, Hernández, U.Á., (...), Siller, ST, Serrano, MM 2015) Experience of Community Participation in the Adaptation of Urban Solid Waste Management in Mexico | [Experience of Community Participation for the Proper Management of Urban Solid Waste in Mexico]

#### **Conclusions:**

The objective of this study is framed in the Fundamentals of the National Environmental Policy and General Law of Solid Waste, which will strengthen the process and logistics of solid waste management at the level of local and regional governments with national significance; creating guidelines oriented to education, training for an efficient and effective development that is also sustainable over time with the continuous improvements that are established according to the change of needs and priorities.

The essential results of the hypothesis determine that RSUR waste has a direct and significant impact on the contamination process in the district of San Pedro de Cachora. Flores (2005) determines that organic solid waste is that which comes from the remains of inputs of organic origin, therefore the highest percentage would be biodegradable, that is,

its decomposition is natural. They disintegrate quickly considering the climatological conditions, they are transformed into another type of substance or organic material, such as food, stationery, even inorganic, metals with a slower degradation process. Polyethylene or plastic is excluded from these materials because it contains another composition despite having organic compounds with different molecular structure, very complex, generating a very slow decomposition, therefore the recycling procedure in a treatment plant is a social and economic alternative.

Carmona, AR , Bolaños, RR , Hernández, U.Á. , (...), Siller, ST , Serrano (2015), It has been determined that one of the main procedures to provide solutions to the problem of common waste management are the new study innovations as well as the use of new technologies aimed at caring for the environment and reducing risks due to pollution and health care of the population; According to Soto (2019), one of the main alternatives at the national level with reference to other successful practices in the world is compost technology, this process allows an organic substance to be obtained through the process of decomposition, obtaining a substrate for soil improvement.

The process of solid waste management must be related to national and international government provisions, currently there is no real interest in this problem, currently in Peru there are 03 authorized dumps at the national level. There are still inconsistencies in the procedure or flow of collection, classification and final destination, municipalities or authorities still do not have the commitment to implement defined policies aimed at awareness and care for the environment. Likewise, a political decision is needed to define the joint effort in the procedure of a new urban culture that allows for important modifications in each of the stages of the waste collection cycle. Generation Regulatory Authority, (2021); Hu, Y. (2019); Carmona, A.R., Bolaños, RR, Hernández, U.Á., (...), Siller, ST, Serrano (2015).

The purpose of this research, specifically in the scope of study of this article, Municipality of San Pedro de Cachora, is to determine the procedures and application of the process that allow to know, disseminate, the legal technical standards, to the entire population and technical personnel in the collection process, for this it is important the participation of the population and local authorities. referring to the management of domestic solid waste, pollutants and final destination at the Municipal level as a Pilot District at the level of the Apurimac Region and for its high probability of tourist development as the main access to the Archaeological remains of Choquequirao, the second largest in Peru. In order to meet the objectives, a budget item must be determined to meet the basic requirements; identification and determination of the area for the construction of a sanitary landfill that meets the established technical characteristics, acquisition of mobile collection units, duly trained personnel, and provision of protective equipment; Showing citizens as a team of actions and activities in health prevention is essential to achieve success in the process of community intervention. We recommend the use of a participatory methodology in the established proposal. Gutierrez, KG, Fernandes, MAO, Chernicharo, CAL (2019); C. Fuentes (2021); Ghesla, P.L., Gomes, L.P., Caetano, M.O., Miranda, L.A., Dai-Prá, LB (2018); Zhu, Y., Zhang, Y., Luo, D., (...), Li, E., Kong, X.(2021); Benítez-Díaz, P., Miranda-Contreras (2013); González-Arqueros, M.L., Domínguez-Vázquez, G., Alfaro-Cuevas-Villanueva, R., Israde-Alcántara, I., Buenrostro-Delgado, O.(2020)

## **BIBLIOGRAPHIC REFERENCES**

- 2016-2024/National Plan for Integrated Solid Waste Management/ Ministry of the Environment.
- 2020/Solid waste management in times of COVID-19/<https://www.pucp.edu.pe/climadecambio/entrevistas/gestion-de-residuos-solidos-en-tiempos-de-covid-19/>
- 2020/SOLID WASTE MANAGEMENT/<https://cdn.www.gob.pe/uploads/document/file>

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- Ascadnio, F. (2017). [Urban solid waste management plan for the district of El Tambo according to the recommendations of Agenda 21 ]. Universidad Nacional del Centro del Perú-Grado Doctorate.
- Chumbella, A. (2017). Solid Waste Management Policies and Environmental Impacts in the District Municipalities of Ayapata and Ollachea" / PhD degree.
- Garate R. (2017)Collection of solid waste and environmental pollution in the Lima Region, 2016.
- Rodriguez J. (2018) Solid waste and its impact on environmental pollution in the town of Lircay, province of Angaraes - Huancavelica, 2017"/ Universidad Nacional de Huancavelica, doctoral degree.
- 2020/Solid Waste Management/  
[https://cdn.www.gob.pe/uploads/document/file/711161/ANEXO\\_RM.\\_099-2020.MINAM\\_Recomendacionespara\\_el\\_manejo\\_de\\_residuos\\_solidos\\_durante\\_la\\_emergencia\\_sanitaria\\_por\\_covid-19.pdf](https://cdn.www.gob.pe/uploads/document/file/711161/ANEXO_RM._099-2020.MINAM_Recomendacionespara_el_manejo_de_residuos_solidos_durante_la_emergencia_sanitaria_por_covid-19.pdf)
- Ascadnio, F. (2017). [Urban solid waste management plan for the district of El Tambo according to the recommendations of Agenda 21 ]. Universidad Nacional del Centro del Perú-Grado Doctorate.
- 2020/The International Solid Waste Association Management/ [www.iswa.org](http://www.iswa.org)
- 2020/Various Waste Disposal Problems/ [www.conserve-energy-future.com](http://www.conserve-energy-future.com)