

Solid Waste Management from the Perspective of the Right to a Healthy Environment: Progress and Challenges in Peru, Mexico and Chile

Julissa Mozombite Paredes¹, Martín Pinchi Bartra²

Abstract

This research work contemplates the reality that is being experienced regarding the management of solid waste in Peru, Mexico and Chile from a legal perspective, related to the fundamental value of the right to a healthy environment. It is argued that the progress achieved with the proper use of solid waste, the management of such advances has been positive or has remained only in documents prepared by the public management for a better management of solid waste and contemplate a better panorama of the law. To this end, the documentation of policies and reports of the problems that persist over time regarding the proper use of solid waste in three Latin American cities such as Lima, Mexico City and Santiago de Chile is analyzed; and, consequently, relate the effect of these documents to improve the relationship of the fundamental right to a healthy environment, constitutionally protected by the laws of the cities in question. Likewise, the constitution that gives the importance of promoting a call to all citizens and authorities in order to achieve the long-awaited sustainable development for the common good of people and the environment in which they live.

Keywords: *Solid waste, right to a healthy environment, Sustainable development.*

Introduction

Solid waste management from the perspective of the right to a healthy environment is an issue of great importance in the most polluted cities in Latin America. The right to a healthy environment is recognized in several legal frameworks and constitutions in Latin America, and seeks to guarantee people access to a healthy environment free of ecological risks. Waste or solid waste caused by human groups has always been a problem of enormous magnitude, but its disposal as an environmental problem has been a matter of much thought in recent years. Solid waste comes from human growth that is reflected in the exploitation of ecosystems and in the consumption and productivity of capitalist industry (Alcocer, 2019). The accumulation of waste and the waste of wealth is a major concern from the perspective of the rights of nature. In Peru, Mexico City and Santiago de Chile, there is an interesting perspective on the different environmental challenges due to their size, urban growth and industrial activities, which makes it possible to analyze the impact of various sources of pollution and evaluate the measures implemented to address these problems.

The study is justified in the most polluted cities in Latin America such as Lima, Mexico City and Santiago de Chile that face significant challenges in solid waste management. These challenges include the lack of adequate infrastructure for waste collection and disposal, lack of environmental awareness, and inadequate waste management practices, therefore, when this problem occurs, it is essential to implement effective policies and measures to address these challenges and promote adequate solid waste management (Sánchez and Cruz, 2019). This involves implementing efficient collection systems, promoting waste separation and recycling, building adequate infrastructure for waste disposal, and environmental education to foster community awareness and participation.

The right to a healthy environment in Latin America emerges as an essential principle to guarantee the health and well-being of present and future generations. In a region characterized by its cultural, ecological and geographical diversity, this right acquires a unique relevance that goes beyond legal aspects, becoming an ethical and social imperative. In a context in which Latin American populations face challenges such as rapid urbanization, the exploitation of natural resources and the intensification of industrial production, the right to a healthy environment is presented as a guiding beacon. This right implies the obligation to

¹ PhD student in the PhD Graduate Program at the César Vallejo University, Peru, Master's degree in Public Management from the Cesar Vallejo University, Peru. ORCID: 0000-0002-1657-4928. Email: jmozombitep@ucvvirtual.edu.pe.

² Master's Degree in Criminal Law and Criminal Procedure and Public Management. PhD student in the PhD Graduate Program at the César Vallejo University, Peru. ORCID: orcid.org/0000-0002-3265-6544, Email: mpinchib@ucvvirtual.edu.pe.

safeguard the health of communities in the face of environmental threats, while promoting equity in access to a safe and healthy environment.

The Pacific Alliance, which is made up of Chile, Colombia, Mexico and Peru, aims to preserve the environment and guarantee a fundamental right to a healthy environment to explore collaborative strategies to address environmental challenges, in particular, solid waste management. In Latin America, where sustainability and equitable development are priorities, the Pacific Alliance is presented as a favorable framework for cooperation in the implementation of shared environmental policies.

With regard to the Political Constitution of Peru on fundamental rights, mention is made of article 2 as a fundamental right to a healthy environment for all citizens, paragraph 22 of the legal norm, emphasizing that the right to live in an adequate environment has taken on relevance to be distinguished as a right accredited as elementary for the human being. Benefiting a harmonious relationship of the environment in which we live. Being part of the collective, the guarantee of environmental protection is required, with an observation of various fields; the first from an aspect of legitimate benefit of resources, and the other, from understanding the responsibilities that we all have in order to preserve nature from generation to generation. It is necessary to say that this right itself has a special autonomy from others, because it encompasses relations of the human being with his environment. However, when both directions are violated, it is where conflict and imbalance abound as consequences of poor solid waste management, greatly affecting that universal value (Constitución Política del Perú, 1993)(Gómez, 2022).

In this sense, the objective of this study is to analyze the policies and programs on solid waste management and the right to a healthy environment. In addition, determine if policies and programs are close to the management of adequate solid waste and to finding a healthy environment. That is why the following question was raised: ¿will the policy proposals and programs be contributions that help guarantee adequate solid waste management and the right to a healthy environment?

Method

The methodology presented is designed as a non-experimental descriptive one, because the study variable was not manipulated. It was descriptive of qualitative approach, because the analysis of the documentary review and the compilation of government sources, environmental reports and academic studies was made for the comparison of solid waste management and the right to a healthy environment in the cities of Lima, Santiago de Chile and Mexico City. In accordance with the policies and their programs that guarantee adequate solid waste management and the right to a healthy environment.

Theoretical Support For Solid Waste And The Right To A Healthy Environment

Theoretical Bases of the Right to a Healthy Environment

In the context of solid waste management in Latin America, there are several theories and approaches that are relevant to addressing the specific challenges of the region. These theories and approaches are critical to developing effective strategies that promote sustainability and responsible waste management.

Alexy (1993) explains that the theory of fundamental rights maintains that we must recognize that this theory is understood as the idea of being able to make rights effective horizontally (horizontal effectiveness), vis-à-vis individuals as well as vis-à-vis the State: This theory is based on the idea that all rights are interrelated with duties. Ensure that all people live in a democratic society. This concept of basic rights is important. Because we are talking about a superior source of fundamental environmental rights. But that aggressive phase is sensible.

In this way, Lorenzetti (2008) in his theory of environmental law explains that the ecological model complements the collective benefit by including tasks that are characterized as positive and negative: the first refers to the task of preserving ecosystems, that is, natural resources; The second focuses on behaviors

that do not contaminate or harm others. The interest in collective protection arises in the exercise of individual rights when they irrevocably threaten the common good.

From the theory of the circular economy, he proposes a paradigm shift from the linear model of "use and dispose" to a circular model that encourages reuse, recycling and waste reduction (Guzmán & Fontela, 2003). In Latin America, this approach involves promoting practices that maximize the value of products, materials, and resources throughout their life cycle, thereby reducing waste generation. On the theory of Extended Producer Responsibility (EPR), it establishes that producers must assume responsibility for products from their design to their final disposal (De Titto & Savino, 2022). In Latin America, the implementation of EPR systems can incentivize producers to design more sustainable products and to properly manage the waste generated by their products.

On the theory of environmental education is key to changing behaviors and promoting sustainable practices in waste management (Márquez et al., 2021). In Latin America, educational programs can increase awareness about the importance of properly sorting waste, reducing consumption, and engaging in recycling initiatives, and environmental justice theory addresses inequalities in the distribution of environmental impacts, ensuring that the most vulnerable communities are not disproportionately affected. In Latin America, this approach is relevant to ensure that waste management policies do not harm marginalized groups.

The right to a healthy environment is a crucial component of human and environmental rights. Its definition reflects the recognition that all people have the inherent right to live in an environment that promotes health, well-being, and quality of life *vida.es* recognized in various constitutions, international treaties, and national legislation (Restrepo, 2021). The Rio Declaration on Environment and Development (1992) states that individuals have the fundamental right to a healthy and balanced living environment. This right has been incorporated into constitutions in several Latin American countries and around the world.

In Peru, the right to a healthy environment is recognized and supported by the Political Constitution of Peru, as well as by various environmental laws and regulations, provided for in the Political Constitution of Peru, which establishes in its article 2, paragraph 22, the right of every person to enjoy a balanced and adequate environment for the development of his or her life. In addition, it establishes the responsibility of the State and society in general to contribute to the preservation of the environment, as well as regulations such as the General Environmental Law, Law No. 28611 and the Law on Integrated Management of Solid Waste, Law No. 27314, which establish the rules for the comprehensive management of solid waste. Its objective is to guarantee the protection of people's health and the environment, promoting the reduction, reuse and recycling of waste and having a healthy environment.

Likewise, in Mexico the right to a healthy environment is recognized in the Political Constitution of the United Mexican States and is reinforced through various environmental laws and regulations, as in Article 4 of the Constitution recognizes the right to a healthy environment. It establishes that every person has the right to an environment adequate for his or her development and well-being, as well as the duty to preserve it. In Chile, the right to a healthy environment is also supported by the Political Constitution and various environmental laws, where the Chilean constitution establishes in its article 19 the right to live in an environment free of pollution. In addition, it recognizes the obligation of the State to ensure that this right is not affected and to protect the diversity of the environment

Solid waste management and environmental importance

The various local governments are actors with responsibility for being able to properly manage the final disposal of such waste. However, many of the difficulties are reflected in the disorganization that comes to pass, also because of the few resources and above all because of the difficulty of what it is to entail decision-making in different countries. The concept of solid waste is defined as being the result of different actions caused by ourselves. This means that these actions can be admitted as not useful or that within a time they can be discarded at some point disposable for people, likewise waste can be used for a good and beneficial purpose for the environment and the relationship we have with it. Therefore, solid waste is everything that

contains a heterogeneous mass of garbage produced by an urban society with a more homogeneous accumulation of waste, such as industrial, mineral, and agricultural waste (Velez et al., 2022).

Integrated solid waste management is an option to take advantage of solid waste, through treatment for its transformation and to have controlled final disposal in favor of the ecosystem and the common good of people. The Environmental Protection Agency aims to reorganize good consumption habits in people, so there is an improvement that not only lies in throwing the trash can; but also in a correct classification of these, trying to minimize contamination due to this waste caused (Raza & Acosta, 2022).

Main difficulties in working with the population

Lack of awareness, there is still a high gap for all citizens to know how relevant it is to be able to organize solid waste for the benefit of obtaining a healthy environment and above all to be able to maintain balance with the ecosystem without polluting it. In the absence of encouraging the correct management of solid waste, each country has its own way of carrying out the final disposal of garbage waste, and as they have a regulation that is only based on creating more and more legal regulations, without putting into practice that the important thing is to create habits so that citizens do not feel obligated, the important thing is that each individual wants to do it. Limited resources, financing is an activity that must contain adequate control so that urban waste management programs can be counteracted and, as far as possible, minimize the volume they cause (Candia et al., 2021)

Political importance

Public policies refer to how disappointing are the few practices that are carried out on environmental issues. It is necessary to have a lot of conviction to make transformations towards sustainable development or sometimes to carry out fair acts to have a political impact in unpleasant situations with the environment or other problems. Strategic allies possess a substantial connection between state spheres and the scope to improve public policy objectives. For the most part, it is facilitated when the authorities have access to the situation of the problem, therefore, they become the main authors of the resolution of the conflict. The main characteristics of the governmental character are change if the implementation of policies does not work positively. (Moreno, 2020)

Solid waste management and the right to a healthy environment have a high level of political importance with significant implications for the well-being of society and environmental sustainability, where important aspects such as public health stand out, having the implementation of efficient waste management policies contributes to safeguarding the health of the population, and thus the preservation of the environment, promoting recycling and waste reduction practices, which contributes to the conservation of biodiversity and the quality of the ecosystem.

Universal human right: the right to a healthy environment.

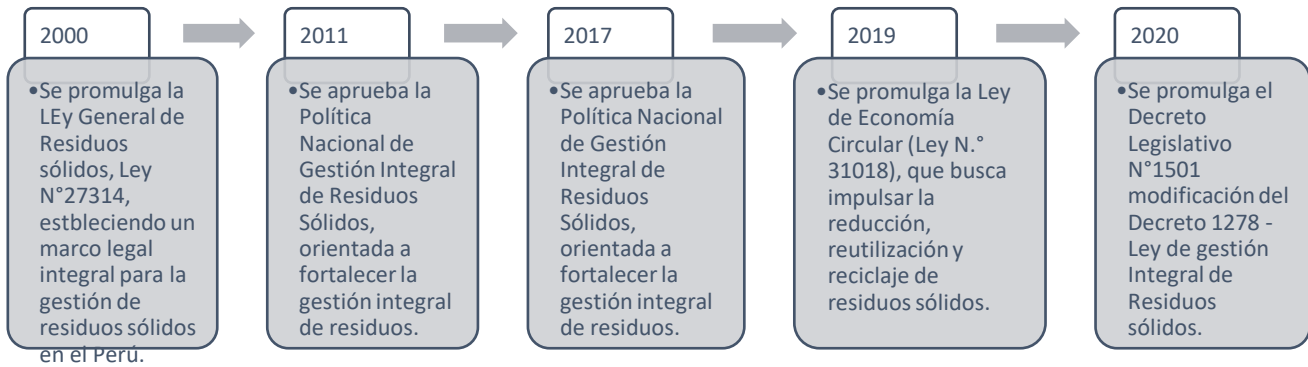
The essential right to an ideal environment requires multiple weights from the State and the private sector. The state has the responsibility and obligation to encourage environmental protection policies, trying to maintain the conservation of the place where we live (Andrade & De la Cruz, 2022). Article 25 of the American Convention on Human Rights describes the protection of the environment, this form of protection values the international sphere until each state constitutionally declares this universal right like any other fundamental right (Fristán & Revuelta, 2022).

The concepts are mentioned in the American Convention, because there are repeated occasions that there are events that occur in States that affect this right for all persons. The violation transcends other fundamental rights, such as: health, and often even life. Advisory opinion 23/17 presented by Cerqueira in 2020, refers to the healthy environment instrument, as an autonomous value and above all of a justifiable nature within the framework of Article 26 of the American Commission on Human Rights; being so, what happened in 2017 from the Lagos event v. Peru, where the direct affectation of several rights with protective guarantees in the aforementioned provision is proclaimed (Brun, 2021).

Solid waste and its regulatory evolution.

The way in which the standard has evolved in relation to the current changes in the environment, is to be able to describe the important step that has been taken in reference to the need of the environment where we live and how it has been interacted with, preserving or not preserving its conservation:

Figure 1. Timeline of the regulatory evolution of solid waste in Peru.



Source: Authors.

First, Law No. 27314 General Law on Solid Waste was adopted, a creation granted by the Congress of the Republic of Peru in 2000, adjusting to the principles of the same Environmental and Natural Resources Code that was approved through Legislative Decree No. 613, and mainly this first aspect was the beginning of trying to establish an integral culture of management of good residual practices in the Peruvian country.¹⁴ Some time later, in the face of climate change and the advanced growth of the population that lives in this part of the world. The need arises to regulate and modify certain changes in decision-making on the correct performance of the garbage that increases. For this reason, Legislative Decree 1278^o - Law on Integrated Management of Solid Waste is formed.

In 2020, regulatory changes were made again, issuing Legislative Decree No. 1501 that modifies the decree mentioned above. The variety is exposed in terms of some articles that according to reality was accommodated according to environmental problems, some of the articles are: 9, 13, 16, 19, 23, 24, 28, etc.

Figure 2. Timeline of the regulatory evolution of solid waste in Mexico



Source: Authors.

The regulatory evolution of solid waste in Mexico began in 2003 when the General Law for the Prevention and Integral Management of Waste (LGPGIR) was published, which is the legislation that establishes the regulatory framework for the sustainable management of solid waste, which aimed to prevent and reduce

the generation of waste. promote proper management, encourage recycling and establish clear responsibilities for the various actors involved in waste management. In 2010, the Official Mexican Standard NOM-161-SEMARNAT-2010 was approved, which established the criteria for the separation of urban solid waste at the generating source in Mexico.

In 2012, the Program for the Prevention and Integral Management of Waste (PGRIR) was launched, seeking to strengthen actions for the management of solid waste. For the year 2022, the Official Mexican Standard NOM-004-SEMARNAT-2019 is approved, which establishes the criteria for the comprehensive management of solid waste.

Figure 3. Timeline of the regulatory evolution of solid waste in Chile.



Source: Authors.

The timeline reflects the progressive evolution of Chilean regulations on solid waste, highlighting the shift towards more comprehensive approaches, the incorporation of extended producer responsibility and the promotion of the circular economy as fundamental pillars for more sustainable and efficient waste management in the country of Chile.

Fundamental right to enjoy an adequate environment

The habitat in which we live and its form of protection in the world have been reasons to be treated in recent times. Law, being a type of science, always adapts to reality and establishes new regulations that at first start from a problem in order to be able to give a legal basis in the end so as not to transgress rights and/or duties. The fundamental right is often a term that is given equal value when mentioning a human right; however, both terms are totally different (Restrepo, 2021).

Advances

The main cause of the generation and spread of solid waste is above all due to the growth of people in each city of the country. However, the desire to be able to solve this problem is to start from the government itself, and how do you know decentralization is a way of governing that Peru has in order to have a more direct relationship, of the citizen with his authority. The management of garbage waste, through reuse in composting and obtaining material for recycling, will make economic actions can serve to give job opportunities to people who are interested in this area.

The General Director of Solid Waste of the Ministry of the Environment in 2021, explains that Peru has approximately 70 million Peruvian citizens. To this end, a solid waste production estimated at 21 thousand tons of municipal garbage on a daily basis. It is necessary to say that the per capita generation of what each inhabitant produces is 0.8 kilograms of consumption, having as an effect how much waste is being produced. More than half of the waste generated in organic matter, being imported: food preparation waste (Huamaní et al., 2020).

There is the National Solid Waste Management Plan, with a projection from 2016 to 2024, which focuses on good actions to address as much as possible the minimization of environmental pollution in different cities of the country, formulating environmental policies with tools such as this one, which establish directions or guidelines in order to be able to enhance the activities that have been practiced with solid waste. Public policies in solid waste management have important objectives that develop, differences in three classifications: 1) It seeks to promote and achieve the total guarantee that the cleaning service complies with the prevention of environmental pollution and safeguards the health of citizens. 2) Encourage the expansion and implementation of reduction strategies, as well as reuse and recycling of solid waste, with environmental responsibility oriented towards sustainable development. 3) Improve comprehensive management, with adequate regulation of the institutions that help to form citizen participation and corporate responsibility.

Challenges

The challenges are related to issues that have not yet been fully improved. Despite the fact that the state has good regulations, the practice of this has been scarce with the advances exposed. Because to the extent that what is desired is to achieve all the objectives that the state agenda has is issues of environmental protection in relation to a healthy environment. Some challenges are:

- a) Develop principles of minimization of solid waste, to the extent that citizens must be responsible with our consumption, thinking and planning what to do with the waste that is being generated. On this basis, one will decide for oneself what appropriate destination to give to the classification of these. Responsible consumption is essential to be able to start with good environmental practices, seeking awareness among the authorities and training in environmental education, from the different levels of government.
- b) The existence of gaps in terms of the final disposal of solid waste, there is a joint strategy with the Ministry of Economy and Finance, in order to recover organic waste, valorize inorganic waste that can be recycled. The gap indicates that there is still a lack of progress because there is only 50% progress.
- c) Promote works by tax, apply this mechanism for public investment projects, in the field of municipal solid waste in alliance with regional and local governments.
- d) Promote information systems, put more emphasis on the practice of the municipal diverse information system in order to monitor and accompany so that everything that is reflected in the state policy can be complied with and presented with the transparency of life.

Discussion of Results

From the results and the documentary review of the policies and programs applied to solid waste management in Lima, Peru, various policies and programs have been implemented to address solid waste management and promote a healthy environment, finding as an important part the Law on Integrated Solid Waste Management (Law No. 27314). which establishes the provisions for the comprehensive management of solid waste in the country. It provides a legal framework for the classification, collection, transport, treatment and final disposal of solid waste, with the aim of promoting more sustainable practices, which by laying the foundations for the regulation and supervision of waste management, has generated a great impact promoting the reduction in waste generation and encouraging citizen participation in proper classification.

In this way, the Municipality of Lima has implemented the Source Separation Program "Recicla Lima", which is a program that promotes the separation of waste at the source. Through awareness campaigns, the proper classification of waste in households is promoted, which has contributed to increasing recycling rates by facilitating the recovery of recyclable materials at the source, with the participation of society and the community, which has been an important point to achieve the expected changes, these functions are

supported by Legislative Decree No. 1278 and modified by Resolution Ministerial No. 098-2023-MINAM. That by means of a supreme decree amending the Regulations of Legislative Decree No. 1278, the Legislative Decree approving the Law on Integrated Management of Solid Waste, approved by Supreme Decree No. 014-2017-MINAM, and the Regulations of Law No. 29419, the Law regulating the activity of recyclers, approved by Supreme Decree No. 005-2010-MINAM, the same that generates the incentive for the creation and strengthening of companies dedicated to recycling in Lima. Collaboration with the private sector has been key to increasing efficiency in waste management and strengthening the recycling chain, this promotion of recycling companies has contributed to the generation of employment and the increase of recycling capacity, reducing the amount of waste sent to landfills

Through this implementation, Recicla Lima obtained significant results such as the education of the population of Lima on the correct way to segregate their solid waste and the same that has promoted responsible environmental behaviors in citizens, emphasizing the selection, segregation and recycling of waste at home and institution, the installation of recycling stations has been made in the Cercado de Lima, which has contributed to the awareness of neighbors and has achieved the participation of more than 14,321 people. One of the most striking results is that during 2021, about 1,445 tons of usable waste, including paper, cardboard, glass and plastic, were collected through the Recicla Lima program. In addition, about 16,648 citizens were sensitized and the district's formalized recyclers were supported through the Lima School of Recyclers. The program has been included in the "En Casa Yo Reciclo" application of the Ministry of the Environment, which allows more citizens to access information on the correct segregation of solid waste

From the results, according to the documentary review of policies and programs that have encouraged solid waste management and the right to a healthy environment in the city of Santiago de Chile, the Law for the Promotion of Recycling and Extended Producer Responsibility (REP Law) is available, which establishes extended producer responsibility, forcing companies to properly manage the waste generated by their products. It also promotes recycling and sets specific goals for the recovery of priority packaging and products.

The same that has had significant results and advances in waste management and the promotion of recycling, which has led to the creation of selective collection and recycling systems for various products, such as packaging, tires, lubricating oils, batteries and batteries, among others. These systems seek to increase the recycling rate and reduce the amount of waste that reaches landfills by establishing collection and recycling goals for the different products subject to the REP Act. These goals are established by the Ministry of the Environment and seek to encourage producers to comply with their responsibilities in terms of waste management. It has also promoted environmental education and awareness about the importance of recycling. Dissemination campaigns and education programmes have been developed to encourage citizen participation in the separation and recycling of waste.

In the city of Chile, Recycling Programs and Clean Points have been made, places where citizens can take recyclable materials. These programs facilitate the proper disposal of waste and encourage the recovery of valuable materials, which has had a great impact on increasing the amount of recyclable materials collected and has promoted a culture of recycling in the community. These programs have had a great result taking into account the certification of grassroots recyclers and the implementation of recyclable waste collection programs in the commune, which has benefited hundreds of homes and households. Also the installation of green points in the community of Peñalolén, which has expanded the existing network of clean points and the pilot recycling plan at Santiago Airport, which has quadrupled the amount of waste recovered monthly. Therefore, this means that recycling programs and clean points are generating positive results in terms of increasing the amount of waste recycled and raising awareness of the importance of the circular economy.

In comparison with the documentary review of policies and programs that have encouraged solid waste management and the right to a healthy environment in Mexico City, there is the "Solid Waste Law of the Federal District". This law aims to regulate the comprehensive management of solid waste in the Federal District. In Mexico City, the integrated management of solid waste is based on various regulations, such as

the Political Constitution of the United Mexican States, the General Law of Ecological Balance and Environmental Protection, and the General Law for Prevention and Integral Management of Waste and its regulations, the Solid Waste Law of the Federal District and its regulations, and the Integrated Waste Management Program for Mexico City 2021-2025, the waste policy of the Government of Mexico City focuses on the prevention and minimization of waste, following the Circular Economy approach. Actions, operations and processes are implemented to reduce the amount of waste at each stage: generation, collection, collection, storage, treatment and proper disposal. In addition, inter-institutional coordination of the administrative areas involved is promoted.

Within the fulfillment of the results of society and its rulers, it has had mixed results in terms of its compliance. Although actions and programs have been implemented to improve the integrated management of solid waste in Mexico City, there are still challenges and areas for improvement. Within the procedure for the implementation of the law, documentary and technical diagnoses have been carried out, actions have been proposed and indicators have been proposed to evaluate progress in its compliance. In addition, responsible production and consumption have been promoted, establishing the principles of circular economy in production systems and fostering environmental culture.

However, it is important to note that the implementation and enforcement of the law faces challenges. For example, the reduction in waste generation and the prohibition of plastic bags and single-use products have been implemented measures, but it is necessary to ensure compliance and raise awareness among the population about their importance. Greater coordination and participation of the actors involved, including street vendors, is also required to ensure compliance with the provisions of the law.

From the discussion of results on Solid Waste Management and the right to a healthy environment in Lima-Peru, Santiago de Chile and Mexico City, a comprehensive vision of the policies and programs implemented to address solid waste management and promote a healthy environment is contextualized, having as key points in what concerns the city of Lima the importance of Law No. 27314 as a legal framework in the management of solid waste in Peru. This law addresses the classification, collection, transportation, treatment and final disposal of solid waste, promoting sustainable practices and the implementation of this program by the Municipality of Lima demonstrates a proactive approach to encourage waste separation at the source. Citizen participation is highlighted as a key component for the success of the program with collaboration with the private sector, supported by regulations such as Legislative Decree No. 1278, has been essential to increase efficiency in waste management. This has contributed to the strengthening of the recycling chain and the generation of employment, generating positive results, such as the collection of tons of usable waste, citizen awareness and support for formalized recyclers, indicate the positive impact of the Recicla Lima program in the community.

Likewise, what was obtained from the results of the city, Santiago de Chile is very important, the Law for the Promotion of Recycling and Extended Producer Responsibility is presented as a legal framework that obliges companies to properly manage the waste generated by their products. Specific goals are mentioned for the recovery of priority packaging and products. Taking into account that the implementation of recycling programs and clean points has been done, the importance of providing the community with options for the proper disposal of waste is highlighted. The increase in the amount of recycled waste and awareness of the circular economy are highlighted. Therefore, public-private collaboration and educational campaigns are mentioned as key elements to increase the recycling rate and reduce the amount of waste sent to landfills.

From the results of the review of Mexico City's documentation, the "Solid Waste Law of the Federal District" is mentioned as part of the legal framework that regulates integrated waste management in Mexico City, which stands out for a way of adopting a circular economy approach in waste management. promoting the prevention and minimisation of waste at all stages. Although actions have been implemented to improve waste management, challenges are recognized, such as ensuring compliance with measures such as the reduction in waste generation and the prohibition of single-use products.

In all three cases, citizen participation is presented as an essential component for the success of the programs. Environmental education and awareness are key tools to change behaviors. Having effective collaboration between the public and private sectors is highlighted in all cases as a determining factor to improve efficiency in waste management and strengthen the recycling chain. Tangible results are highlighted, such as the amount of waste recycled and citizen awareness, to demonstrate the positive impact of the programs implemented. Overall, the cases of Lima-Peru, Santiago de Chile, and Mexico City reflect significant efforts to address the challenges of solid waste management, with a focus on sustainability and community engagement.

Conclusion

1. The implementation of various policies and programs, supported by the Law on Integrated Solid Waste Management (Law No. 27314), has had a positive impact on solid waste management in Lima. Citizen participation, highlighted through the "Recicla Lima" Program, has contributed to the reduction of waste generation and the increase of recycling rates with effective collaboration between the public and private sectors, evidenced in the collaboration with recycling companies, has strengthened efficiency in waste management. This collaboration has not only reduced the amount of waste sent to landfills, but has also created jobs and increased recycling capacity.
2. In Mexico there are solid regulations for solid waste management, the gap between theory and practice persists as a prominent challenge. Effective implementation and monitoring are essential to ensure the effectiveness of existing policies. Better inter-agency coordination, stricter enforcement of regulations, and a more comprehensive approach to community engagement can significantly strengthen waste management programs. In addition, the promotion of innovation and sustainable technologies could make a difference in the sustainable approach to this problem.
3. According to policies and programs, Chile stands out for its advances in solid waste management, supported by effective regulations and a more robust infrastructure. Despite these achievements, specific challenges persist in hazardous waste management and in some regions of the country. Consolidating efforts to address these problem areas, along with the continued incorporation of sustainable technologies, can lead to substantial improvements. Chilean society, already actively engaged, has the potential to play a critical role in the continued success of waste management programs and in promoting a healthy environment for all.

References

- Alcocer, P. R. (2019). Improvement of the integrated management of urban solid waste in the canton of Quevedo, Ecuador. *University and Society*, 11(5), 362-367. <https://rus.ucf.edu.cu/index.php/rus/article/view/1385>.
- Alexy, R. (1993). *Theory of Fundamental Rights*. Centro de Estudios Madrid.
- Andrade, C., & De la Cruz, O. (2022). Corporate social responsibility: a strategy to promote and guarantee the protection of the fundamental right to a healthy and balanced environment. *Revista de Derecho Ambiental*, 2(18), 197-229. <https://doi.org/10.5354/0719-4633.2022.66370>
- Brun, M. (2021). The legal protection of the human right to a healthy environment in Uruguay. *Revista de Derecho*(23), 116-141. <https://doi.org/10.22235/rd23.2517>
- Candia, D., Cid, D., Rojas, J. G., & Sepúlveda, G. (2021). Household Waste Management and Recycling Policy in the municipality of Villarrica. *Territories and regionalisms*(4), 1-10. <https://revistas.udec.cl/index.php/rtr/article/view/3324>.
- Congress of Mexico City. (2023). *Solid Waste Law of the Federal District*. https://congresocdmx.gob.mx/archivos/transparencia/LEY_DE_RESIDUOS_SOLIDOS_DEL_DISTRITO_FEDERAL.pdf
- Political Constitution of Peru. (1993). Article 2, paragraph 22.
- Legislative Decree No. 1278, Law on Integrated Solid Waste Management (December 23) of 2016). *System National of Environmental Information*. <https://sinia.minam.gob.pe/normas/decreto-legislativo-que-modifica-decreto-legislativo-no-1278-that-approves>
- Legislative Decree No. 1501, Legislative Decree that modifies Legislative Decree No. 1278. *National Environmental Information System*. file:///D:/Downloads/d_leg_no_1501.pdf.
- De Titto, E., & Savino, A. (2022). What are we talking about when we talk about extended producer responsibility? *Isalud*, 17(82).

- Gómez, H. M. (2022). Right to a Healthy Environment. The case of the Laguna del Carpintero Mangrove. *IUS*, 16(49), 65-107. <https://doi.org/10.35487/rius.v16i49.2022.714>
- Guzmán, J., & Fontela, E. (2003). The circular theory of development. A complex approach. *Estudios de Economía Aplicada*, 21(2), 221-242. <http://hdl.handle.net/11441/16477>.
- Huamani, C., Tudela, J. W., & Huamani, A. (2020). Solid waste management in the city of Juliaca (Puno, Peru). *Journal of High Andean Research*, 22(1), 106-115. <https://doi.org/10.18271/ria.2020.541>
- 2021 Results Evaluation Report-National Environmental Policy to 2030. <https://www.minam.gob.pe/transparencia-wpcontent/uploads/sites/48/2022/06/REPORTE-DE-EVALUACION-2021-PNA.pdf>.
- Law No. 28611, "General Law of the Environment", 2005, available at: <https://www.gob.pe/institucion/congreso-de-la-republica/normaslegales/>
- Law No. 27314, General Law on Solid Waste (July 20, 2000). <https://sinia.minam.gob.pe/normas/ley-general-residuos-solidos>.
- Lorenzetti, R. L. (2008). Theory of Environmental Law. Porrúa.
- Márquez, D. L., Hernández, A., Márquez, L. H., & Casas, M. (2021). Environmental education: conceptual and methodological evolution towards the objectives of sustainable development. *University and Society*, 13(2), 301-310. <https://rus.ucf.edu.cu/index.php/rus/article/view/1968>.
- Ministry of the Environment of Peru. (2021). Results and advances in solid waste management in Peru. Video archive [YouTube]. <https://www.youtube.com/watch?v=dGXta-cmeQg>.
- Ministry of the Environment of Chile. (2016). Framework Law for Waste Management, Extended Producer Responsibility and Promotion of Recycling. Law No. 20,920. Chile. <https://www.bcn.cl/leychile/navegar?idNorma=1090894>
- Ministry of the Environment. (2023) Ministerial Resolution No. 098-2023-MINAM. <https://www.gob.pe/institucion/minam/normas-legales/4007714-098-2023-minam>
- Moreno, I. d. (2020). Grassroots Organizations and Environmental Injustice: The Relevance of Strategic Alliances for Public Policy Advocacy. The case of waste policies in the Metropolitan Region of Buenos Aires. *Management and Public Policy*, 29(1), 131-162. <https://doi.org/10.29265/gypv.v29i1.659>
- National Plan for Integrated Solid Waste Management 2016 to 2024. Ministry of the Environment. file:///D:/Downloads/plan_nacional_rrss.pdf.
- Raza, D., & Acosta, J. (2022). Environmental planning and the recycling of urban solid waste. *Economy, Society and Territory*, 22(69), 519-544. <https://doi.org/10.22136/est20221696>
- Restrepo, J. F. (2021). A healthy environment as a fundamental right in Colombia. *Journal of Bioethics and Law*(52), 287-301. <https://doi.org/10.1344/rbd2021.52.31986>
- Sánchez, M. d., & Cruz, J. G. (2019). Urban solid waste management in Latin America: an analysis from the perspective of generation. *Journal of Finance and Economic Policy*, 11(2), 321-336. <https://doi.org/10.14718/revfinanzpolitecon.2019.11.2.6>
- Ministry of Environment and Natural Resources (SEMARNAT). (2003). General Law for the Prevention and Integral Management of Waste (LGPGIR). *Official Gazette of the Federation*, October 8, 2003. https://www.dof.gob.mx/nota_detalle.php?codigo=723556&fecha=08/10/2003
- Ministry of Environment and Natural Resources (SEMARNAT). (2010). Official Mexican Standard NOM-161-SEMARNAT-2010, which establishes the criteria for the separation of urban solid waste at the generating source. *Official Gazette of the Federation*, May 24, 2010. https://www.dof.gob.mx/nota_detalle.php?codigo=5146073&fecha=24/05/2010
- Ministry of Environment and Natural Resources (SEMARNAT). (2019). Official Mexican Standard NOM-004-SEMARNAT-2019, which establishes the criteria for the comprehensive management of hazardous waste. *Official Gazette of the Federation*, December 11, 2019. https://www.dof.gob.mx/nota_detalle.php?codigo=5585594&fecha=11/12/2019
- Tristán, M. S., & Revuelta, B. (2022). Urban Environmental Justice: Lights and Shadows in the Mexican Legal System. *Economy, Society and Territory*, 23(71), 1-28. <https://doi.org/10.22136/est20231793>
- Vélez, D. A., Vargas Restrepo, C. M., Gutiérrez Monsalve, J. A., Gómez Bentacur, M. A., Aguirre cardona, D. A., Quintero Osorio, L. A., & Franco Montoya, J. C. (2022). Solid waste management management: an environmental problem in the university. *Scientific Journal Thought and Management*(50), 153-185. <https://rcientificas.uninorte.edu.co/index.php/pensamiento/article/view/13420>.