

# **Effectiveness of Waste Management in the United States of America**

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### **Abstract**

Waste is a significant concern at this time. No matter what country, waste will always exist in people's daily lives, including the United States. To deal with all types of waste, the United States has implemented policies and regulations called the Environmental Protection Agency (EPA) and 3R. This study aims to see the effectiveness and sustainability of the United States solid waste management policy through the Environmental Protection Agency (EPA). This research was investigated using a green theory framework. The findings showed that the United States has implemented several policies, including the Environmental Protection Agency (EPA) and 3R. This program also implements several activities such as improving the entire solid waste stream and utilizing 50% of solid waste to be used as new goods by 2025, identifying and fixing regulatory barriers to make solid waste utilization more effectively, ensuring that all Americans have equal access to the waste recycling program.

**Keywords:** Green Theory; Environmental Protection Agency; Waste Management; United States

## Introduction

One of the problems faced by urban managers worldwide, including in the United States, is waste management. Along with the increase in economic growth, the standard of living of the population also increases; economic growth is indicated by an increase in production and consumption activities – increased production and consumption activities will impact increasing the number, types, and diversity of characteristics of landfills. In many countries, waste often creates problems. Waste handling that is not managed correctly can cause environmental pollution and disturb aesthetics. Accumulation of garbage or littering in open areas will result in soil pollution, impacting groundwater drains.

Meanwhile, burning waste will result in air pollution. Disposing of garbage into rivers also results in water pollution and clogging of waterways which can cause flooding in the rainy season, odor pollution, and aesthetic disturbances. Furthermore, incomplete waste handling will lead to social problems, such as mass rage, clashes between residents, blocking final processing sites, and others.

In the United States, the President has issued several executive orders alluding to solid waste management in the government. The first executive order, issued in 1993, stated that: "in accordance with the demand for efficiency and cost effectiveness, the head of each executive agency must play a role in preventing the occurrence of

waste and recycling of waste from daily operations" (U.S. Environmental Protection Agency 1993) – as a result of this strategy, the government has succeeded in stimulating the market for recycled goods; the 1993 strategy was followed by the executive order number 13101 namely greening the government through the prevention of wasting waste, recycling, which was strengthened by the need for waste management in the central government (U.S. Environmental Protection Agency 1993) . Landfills for municipal solid waste (MSW) are regulated under Subtitle D of the Resource Conservation and Recovery Act (RCRA). Landfill owners/operators (in the future referred to as operators) are: closed landfills need to be monitored and maintained – iris called the post-closure care (PCC) period (Federal Register n.a) . PCC's four critical elements under Subtitle D are leachate management, groundwater monitoring, final cover inspection, maintenance, and control and monitoring of offsite methane (CH<sub>4</sub>) migration (usually active landfill gas control), depending on the operation of the system is included which receptors can be disclosed to pollutants via limited migration pathways (U.S. Environmental Protection Agency 1993). The EPA delegates the ultimate authority to the states to determine what constitutes the PCC's achievement, but not all states have specific regulations or guidance. State regulations generally require regulations that specify performance-based demonstrations of functional stability in long-term emission potential

(e.g., Washington and Florida) and demonstrations of organic stabilization within waste masses. It is divided into regulations (e.g., Wisconsin).

The United States is a superpower country that has developed a program driven by the U.S Environmental Protection Agency (EPA). This is done because the United States is classified as a country with the most significant level of waste accumulation in the world, especially for solid waste consisting of toxic and hazardous waste, e-waste, and medical waste. Local people consume and use glass, paper, newspapers, cardboard, single-use plastic, cardboard, aluminum, materials in cans, textile waste. Therefore, to minimize the spread of solid waste that can damage the environment and damage human health, the United States has taken the initiative to issue policies in handling solid waste in their country. Through the Environmental Protection Agency (EPA) in 1970, the United States has implemented several resource recovery programs. In this regard, resource recovery includes various technologies that are useful for restoring waste streams. At the start of this decade, the EPA targeted that recycling could increase by 5% to 7% of the total solid waste landfill. Since then, the United States has made recycling an effective way to reduce solid waste. Finally, solid waste management developed by focusing on developing infrastructure technology to manage solid waste around 1980. In this case, can see the effectiveness of concrete waste policies

driven by The United States can see the significance of concrete waste policies driven The United States from the level of implementation and the stability of the number of people who follow regulations such as recycling and placing solid waste in its place. Since 1970 the EPA has attempted to make environmental improvements by implementing the United States government's environmental policies. This is proven to help improve pollution and the environment to suppress global ecological problems. Then, to ensure the success of this program, the Environmental Protection Agency issued The Resource Conservation and Recovery Act (RCRA), which is a law that regulates the disposal of solid and hazardous waste. This law gives the EPA the responsibility for controlling hazardous waste from all necessary stages such as generation, transport, processing, storage, and disposal. Based on the description above, this study aims to see the effectiveness and sustainability of the United States solid waste management policy through the Environmental Protection Agency (EPA).

### **Research Method**

A method is used to solve the problem of an object being examined. This research uses the qualitative descriptive research method. Descriptive research is collecting data based on the factors that support the object of research, then analyzing these factors to look for their role (Arikunto 2010) . Qualitative research is research that deals with ideas, perceptions, opinions, beliefs of the people to be

studied and all of them cannot be measured by numbers. In this study, the theory used in the study is not forced to obtain a complete picture of a thing according to the human view that has been studied (Basuki 2006). Qualitative descriptive approach method is a method of data processing by analyzing factors related to the object of research by presenting data in more depth to the object of research. Qualitative descriptive approach method is a method of data processing by analyzing factors related to the object of research by presenting data in more depth to the object of research.

## **Result**

### **1. Type of Waste**

#### **1.1 Toxic and Hazardous Waste**

During the Industrial Revolution, the chemicals used for the production of certain goods experienced a significant increase. Precisely at the end of World War II, the increase in the use of chemicals was in terms of quantity and the level of damage that a substance would experience if exposed directly to organisms. This is triggered by the desire of the industry to obtain high profits, thus requiring them to produce high quantities of products and variants. The increase in production and various variants will also produce more and more various waste (Damanhuri 2010). It can be said that almost every industry produces toxic and hazardous waste, or it is also called Hazardous and Toxic Waste (B3). The type of waste in question is

waste with a higher level of damage to the environment than other wastes. These wastes are pesticides, paints, heavy metals, cyanide, oil, dyes, solvents. Not only threatens the environment, but this B3 waste also threatens health. As happened in one developed country, the United States. This incident is known as the "Love Canal Tragedy," a love canal in the Niagara Falls area, Newyork. In 1893, an unfinished construction project in the canal area right on the Niagara River left a hole. In the 1940s, there was an electrochemical company looking for a waste disposal site. After going through several processes, the company was granted permission to dispose of its company's waste in the canal. Disposal lasted until 1953, with an estimated 21,000 tonnes of the chemical. Among them are alkalines, dechlorinated hydrocarbons, caustics, and fatty acids. As a result of this waste disposal, environmental pollution impacts human health, such as cancer and physical and mental disabilities in human birth: chlorinated hydrocarbons, caustics, and fatty acids. As a result of this waste disposal, environmental pollution impacts human health, such as cancer and physical and mental disabilities in human birth: chlorinated hydrocarbons, caustics, and fatty acids. As a result of this waste disposal, environmental pollution also impacts human health, such as cancer and physical and mental disabilities in human birth (Riyanto 2013).

## 1.2 E-Waste

. All waste originating from the hospital from medical or non-medical activities, both solid and liquid, is likely to contain toxic chemicals, radioactive substances, and other microorganisms. This requires severe handling and attention because if it is not adequately cared for, it will cause problems, especially in the service aspect, and can also cause environmental damage and a source of disease transmission (nosocomial infection) (Chandra 2006) . In America, attention to the dangers of medical waste emerged in 1987 when at that time along the coast of New Jersey and New York became a nest of used syringes, and this is in line with the increase in the percentage of the amount of medical waste which every year has increased, this is stealing the public's attention.

Furthermore, public fear of the spread of AIDS is increasing (US Bio Clean n.a). The United States is known as the country with some of the most considerable health care and pharmaceutical companies producing medical waste and residue in North America, with an estimated amount of medical waste of around 6 million tonnes annually (Cision PR Newswire 2020) . The United States Environmental Protection Agency revealed that medical waste is a collection of waste originating from health facilities, such as hospitals, doctor's offices, dental practices, veterinary clinics, medical laboratories, and blood banks. Included in the category of medical waste are sharp objects and red bags. Sharp objects are syringes,



scalpels, and several others that can injure. Meanwhile, the red bag is a container used to put materials with the potential or contaminated by blood or other infectious materials (OnSite n.a).

## **2. Waste Management in the United States of America**

Today, people in the United States have disposed of more than 2 tons of solid waste every day. For example, they consume and use glass, paper including newspapers and cartons, disposable plastics, cardboard, aluminum, materials in cans, textile waste, etc. The number of solid limbs produced by the United States per year always increases many times. Structured, solid waste produced by the United States can not be ascertained in the number of charts or by percentage because of the large amount of waste produced. However, according to the U.S. Environmental Protection Agency (EPA), the agency predicts there are about 207 million tons of solid waste produced by the United States so far.

Moreover, around 1993, an estimated 307 tons of solid waste flooded the United States, including household waste and other hazardous waste. Surprisingly, most Americans do not seem to care about solid waste. They do throw waste into the trash, but they do not know how much waste has accumulated in landfills so far. As for tackling solid waste that floods the region, the United States has a solid waste treatment. The solid waste recycling process has been implemented in the United States as part of solid waste management

by designing a modern and open landfill. Another collaborative movement in combating solid waste is to market recovered materials and purchase recycled products in bulk. Thus allowing local governments, especially in large cities, to distribute costs in waste management wisely. Then, because the United States is made up of states and federal governments, state and central governments consult on initiatives to combat solid waste. Therefore, they took the initiative to build an agency that houses solid waste and enacted laws governing solid waste, including waste reduction practices, local solid waste management, recycling, etc. Then, some states also submit technical patronization for local governments. Some agencies that regulate state solid waste policies also actively encourage the development of the recycling market, including incentives, such as tax credits, low-interest loans, and grants, in several places to stabilize and strengthen the market. Fortunately, many states have also implemented regulations related to landfills and the provision of waste management facilities from waste to energy (National Renewable Energy Laboratory 1998).

Since 1970, the United States, through its central agency for solid waste affairs, or Environmental Protection Agency (EPA), has enacted several resource recovery programs. In this case, resource recovery includes a variety of technologies that are useful for restoring waste flow. At the beginning of a decade like this, the EPA targets that recycling could increase by 5% to 7% of the total solid waste deposits.

Since that day, the United States has seen that recycling is an effective way of reducing the amount of solid waste by trialing cans, bottles, aluminum, and paper. Finally, solid waste management was developed by focusing on developing infrastructure technology to manage solid waste around 1980. The progress of the waste industry distributed into energy in the early 1990s declined. Most environmental volunteers question the effectiveness of recycling solid waste into energy. As a result, growth in the industry decreased, and public confidence in waste recycling policy decreased. Recycling also aims to boost economic growth, as recyclable solids will be resold. Initially, solid materials that can be recycled only paper such as newspapers or cardboard and aluminum cans and even damaged solid equipment can not be included as solid waste that can recycle like a damaged car. However, the most commonly recycled is aluminum because of its high price and can save energy. This recycling uses separation techniques that include reduction or destruction efforts, filtration or trommels, space classification, the last is magnetic separation. Long-term planning at the domestic, state, and even regional levels is another way to realize environmental stability with adequate infrastructure tools. We all know that today the U.S. is a superpower rich in natural resources and can monitor global policy. So no wonder the technological excellence that he has sometimes raised a security dilemma in the region. Therefore, the U.S. should allocate existing resources with advanced

technology to sustainably manage solid waste (Tchobanoglous and Kreith 2002). Today, the U.S. already has tools to recycle modern solid waste while banning the sale of single-use goods, including single-use plastics that cannot easily recycle. For example, San Francisco has successfully diverted 80% of material from solid waste through the "Zero Waste by 2020" program. According to him, now is the time to reduce, reuse, and recycle to create a safe environment (Alex 2018). In this case, the EPA is responsible for implementing legislation passed by Congress known as the Pollution Prevention Act of 1990. Epa is also responsible for preventing pollution by eliminating solid waste by modifying production processes, promoting non-toxic materials, enacting conservation techniques, and reusing recyclables. The Pollution Prevention Act defines it as an environmentally friendly practice by reducing the number of hazardous substances or pollutants that meet solid waste flow. Epa re-enacted the recycling system through the Pollution Prevention Act by:

1. Pollution should be prevented as quickly as possible where possible;
2. Waste that cannot prevent (sustainable use) must be recycled in a way that is safe for the environment;
3. Waste that cannot recycle must be addressed using environmentally safe means;

4. Strongly condemn waste disposal into waters, including nearby rivers, but this is used as a final effort and must still include ecological elements in it (Environmental Protection Agency n.d.).

Besides, local governments in the U.S. also play an important role in conserving resources by enacting policies and programs and working to reach out to environmental communities, including initiatives in reducing waste sources. For example, in some cities, there are special locations that the government serves as a place for residents to dispose of the waste for later in recycling according to its type. It then promotes programs that provide financial incentives for waste reduction, such as the recovery of funds for waste recycling programs. Then supervise waste management that is useful for waste identification (Plan 2013). To encourage more utilization of solid waste, the EPA contains:

1. Strive to improve the entire flow of solid waste and utilize 50% of solid waste to be used as new goods by 2025;
2. Identify and improve regulatory barriers to make the utilization of solid waste more effective;
3. Ensure that all U.S. communities have equal access to waste recycling programs;
4. Work with regional partners and local communities to encourage manufacturing and distribution systems to facilitate waste utilization;

5. Fully support the development of the recycling market by providing information and technical assistance to the community, corporations, local governments, even organizations regarding how important it is to utilize waste and its long-term effects if not improved;
6. Support the use of useful products ranging from industrial to commercial
7. Facilitate and expand household B3 waste management opportunities, organic waste, pharmaceutical waste, construction, and demolition waste (Michigan Department of Environmental Quality 2017).

## **Discussion and Analysis**

### **Effectiveness of Waste Management in the United States of America**

The US Environmental Protection Agency, better known as the EPA, is an American national environmental agency formed as a form of public anger and concern in the public environment. The EPA acts as a protection and preservation of the natural environment and enhances human health with impact and policy limits on pollutants' use (Kenton 2020) . Since 1970 the EPA has attempted to make environmental improvements by implementing the United States government's environmental policies. This is proven to help improve

pollution and the environment to suppress global environmental problems (Scientific America 2011).

The Clean Air Act is a policy program from the EPA to control dangerous air policies in 1970. At that time, using paint with lead and also in gasoline content aims to improve engine performance. At least the EPA estimates that there are approximately 5,000 people who die from heart disease due to poisoning and children with a low IQ from lead use. EPA standard use of lead from gasoline fuel and right in 1995 the EPA implemented this practice, and there were significant casualties and toxic substances that had been poisoning (Howard dan Kunzig 2018). The Resource Conservation and Recovery Act (RCRA) is a law that regulates the disposal of solid and hazardous waste. This law gives the EPA the responsibility for controlling hazardous waste from all necessary stages such as generation, transport, processing, storage, and disposal. The United States Congress initiated and passed the RCRA to solve the United States' waste problem due to an increase in the amount of industrial and municipal waste (Biomedical Waste Service 2016).

The objectives of RCRA are, among others, to save energy and natural resources, reduce waste generated from the recycling process and reduce existing waste sources, protect the natural environment from the disposal of toxic and hazardous waste, and protect human health, and finally, waste management, which does not damage the

environment (Biomedical Waste Service 2016) . RCRA is a law that sets standards for solid waste management and overall standards for hazardous waste management. At present, this program is more than 2.5 billion tons of solid, industrial, and hazardous waste, which results from the production and use of commodities in all sectors of the economy; this program also increases 4,000 activities throughout America every year (Rischar 2020). The EPA, as the responsible for the implementation of this program, is bearing fruit. In 2018, the EPA added that aerosols were included in the category of hazardous waste. It is worth noting that aerosols can affect the climate where they will reflect or absorb radiation from the sun and increase the brightness and reflectivity of clouds (Britannica, T. Editors of Encyclopaedia 2020). This arrangement saved \$ 5.3 million annually in the regulatory budget. It did not stop there; the states and tribes of the EPA managed to clean up approximately 400,000 releases from underground storage tanks across America, which has been the program's start.

The EPA also applies regulations on the management of drugs, which are categorized as hazardous waste that saves human health and the environment, especially water, due to widespread disposal in waterways which ultimately threatens human health. The EPA also has a system to track shipments of hazardous or hazardous waste electronically. There are still many other successes from the EPA in implementing this policy (Rischar 2020). The EPA succeeded in



restoring the reusable contaminated land of about 18 million hectares of land equivalent to southern Carolina (EPA 2020). RCRA is an important policy, and the EPA is gradually implementing the law to make the environment and maintain public health even better.

## **Conclusion**

Environmental safety-based solid waste management is a must for every country in the world. Because this will impact all sectors and spread to all corners of the earth. The human need for solid materials makes solid waste fiercely fill the environment. The United States is the country with the highest level of waste spread and the world's worst climate crisis. This is the other side of a superpower country rich in resources and capable of monitoring global policies. They exploit the environment to then re-pollute the environment with materials that are difficult to decompose. There are three types of waste, namely toxic chemicals, electronic waste, and medical waste. To solve the waste problem, the United States has implemented several policies, including the Environmental Protection Agency (EPA) and 3R. Since 1970, the United States, through the central solid waste agency or the Environmental Protection Agency (EPA), has implemented several resource recovery programs. This program also implements several activities such as improving the entire solid waste stream and utilizing 50% of solid waste to be used as new goods by 2025, identifying and fixing regulatory barriers to make solid waste utilization more

effectively, ensuring that all Americans have equal access to the waste recycling program. The EPA program's effectiveness in reducing groundwater contamination due to waste and tracking the whereabouts of waste.

Green theory was present and developed along with environmental problems that became increasingly crucial and became a global issue in the 60-70s. The protests that started only from minorities grew into the center of international attention. Environmental problems spread to almost all parts of the world, of course with different percentages. The main goal of this green theory is to ensure the sustainability of its special environment for future generations. The Environmental Protection Agency is one of the efforts made by the United States in dealing with environmental problems faced by their country. This is in line with the green theory, which indirectly favors the environment and seeks to balance ecology and humans. Waste, which is one of the causes of environmental problems, is present because there is an increase in the need for goods by humans, especially for large companies providing essential human goods. As a developed country, of course, in the United States, there are many industrial companies with a relatively great demand for goods, with a large percentage of demand from the community, which ultimately encourages companies to provide more products and forget that the environmental waste generated will also be more and more, so that not

only threatens but also public health is at stake. Luckily the policies that have been made by the United States are successful or quite effective in dealing with the problems described above for both the environment and public safety and health.

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### **Declaration of Conflict Interes**

The Author(s) declare(s) that there is no conflict of interest regarding the publication of this article (Please include such a declaration in this section if you use English).

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