The importance of waste management: Some observations on Albania

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Abstract

Purpose: *We inhabit an epoch confronted by formidable challenges that imperil our collective well-being. The reliance of economies on fossil fuels, coupled with widespread deforestation, has exacerbated the greenhouse effect, resulting in the degradation of numerous ecosystems and the alteration of the global climate. Concurrently, there is a fervent pursuit of non-renewable resources, heralding a pivotal contest among major producers. The proliferation of production and consumption has engendered a staggering volume of waste, whose mismanagement risks precipitating extreme levels of pollution across land, water, and the atmosphere. These pressing concerns underscore the imperative for a transition from a linear to a circular economic model.*

The purpose of this article is to elucidate these challenges and conduct a comprehensive comparative analysis between the Waste Management Systems of Albania and those of Europe.

Methodology: *A qualitative research study was undertaken to analyse pertinent data, reports, and legislation. The paper draws upon secondary data sourced from*

various entities, including the World Bank, Eurostat, INSTAT Albania, EU legislation, and reports.

Findings: *The findings suggest that the primary waste management strategy in Albania involves landfilling, which is considered the least effective method for waste treatment and utilization. While Albania endeavors to align with the guidelines provided by the European Union, it still lacks a waste management system capable of meeting the established objectives.*

Value: *By delineating the challenges faced by Albania and juxtaposing them with those encountered by EU member states, this paper initiates a broader discourse on innovative strategies, emerging technologies, and cultural influences necessary to attain an effective waste management model.*

Key words: *waste management, circular economy, environment, Albania.*

Introduction

To comprehend the feasibility of constructing an economy capable of redefining our approach to waste, it is imperative to delve into historical antecedents and retrace our origins. The evolutionary trajectory of various civilizations elucidates the genesis of waste and its metamorphosis across epochs. The human presence on Earth, dating back 2 million years, initially manifested within small villages, fostering a symbiotic relationship with natural resources. Notably, there existed an epoch devoid of waste management concerns, where any discarded material served to replenish the soil and foster new resources. Unbeknownst to us, we were inherently enmeshed within a circular economic paradigm, self-sustaining and independent of human intervention.

However, the advent of industrialization precipitated a paradigm shift, marked by heightened urbanization. Sprawling cities emerged, accompanied by a surge in waste accumulation, rendering thoroughfares inundated with refuse sans proper disposal regulations. Concurrently, technological advancements introduced motorized transportation and unsustainable materials, facilitating the proliferation of disposable commodities and packaging. This inadvertent progression heralded the waning of recycling practices. After the aftermath of the Second World War, the inception of the "consumer civilization" ensued, catalyzing an exponential surge in waste production. Novel materials, notably plastics, and byproducts of chemical and steel industries exacerbated environmental degradation. Consequently, environmental exigencies have intensified, prompting a requisite paradigm shift in production, product utilization, and waste management practices.

Research Question: What is the status of waste management in Albania, and how does it compare to European standards?

Literature review

Various definitions of waste exist within scholarly literature. White, Franke, and Hindle (1995) characterize waste as the residual byproduct of human activities, containing identical substances to those found in the primary product, yet lacking utility. Conversely, the Organisation for Economic Co-operation and Development (OECD) defines waste as "*substances or objects, excluding radioactive materials covered by other international agreements, that are either disposed of, being recovered, intended for disposal or recovery, or legally mandated for disposal or recovery under national legislation*" (OECD, 2024). Moreover, Directive 2008/98/EC of the European Parliament and of the Council dated 19 November 2008 elucidates waste as "any substance or object that the holder discards or intends or is required to discard" (European Parliament, 2008).

The literature examining the evolution of waste definitions is extensive. A recurring theme in the afore mentioned definitions is the association of waste with substances slated for disposal. European waste-related legislation aims to safeguard public health and the environment. However, the lack of precision in the definition of waste leads to varying interpretations among European and non-EU countries. In Albania, waste is defined by *Law No.10463, dated 22.9.2011, on the Integrated Management of Solid Waste*. This legislation seeks to protect the environment and human health from pollution and harm caused by solid waste. It establishes regulations governing the environmental treatment of solid waste throughout its lifecycle, including creation, collection, separation, transportation, recycling, processing, and disposal. Additionally, the law aims to minimize waste generation and mitigate its hazardous and detrimental effects.

Waste management poses a complex and pressing challenge for all nations, given its significant environmental impact. The management process must consider various interconnected factors, including economic, regulatory, and technical aspects inherent to the process itself.

The European Union holds jurisdiction over all facets of environmental policy. The Union's environmental policy traces back to the European Council held in Paris in 1972, which underscored the necessity of a community environmental policy aligned with economic growth. This led to the formulation of a program of action aimed at achieving environmental sustainability and combating pollution through measures targeting harmful emissions and waste production. The pivotal Directive 98/2008/EC of the European Parliament and of the Council, issued in 2008, commonly known as the Framework Regulation on Waste, serves as the cornerstone of waste management within the EU. Its objective is to safeguard the

environment by reducing waste and promoting its reuse as a resource. The directive introduces novel elements, including the establishment of a hierarchical waste.

a) Prevention.
b) Preparation for reuse.
c) Recycling (material recovery).
d) other types of recovery, for example energy recovery.
e) Disposal.

FIGURE 2: Waste Framework Directive

https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

Due to the intricate nature of waste management, each country devises and administers a system tailored to specific objectives. Waste management in Albania has evolved since the 1990s, commencing with the enactment of Law No. 8216, dated 13.5.1997, pertaining to the Republic of Albania's accession to the Basel Convention for the Control of Cross-Border Movements of Hazardous Waste and Their Disposal. Subsequent legislation, notably Law No. 10 463, dated 22.9.2011, on Integrated Waste Management, has furthered the country's waste management framework. The primary objectives of this legislation are to safeguard the environment and human health, facilitate proper waste management by a) preventing waste generation or minimizing its negative impacts through integrated waste management practices; b) enhancing resource efficiency; and c) mitigating overall adverse effects stemming from resource utilization.

The Strategic Policy Document serves as the principal planning instrument for municipal, non-municipal, and hazardous waste management in Albania, spanning the period 2020-2035. This strategic framework incorporates advancements in waste sector planning and infrastructure since 2011, reflecting the substantial engagement of both public and private entities, along with significant investments in waste collection, transfer, and treatment. The revised Strategic Policy Document

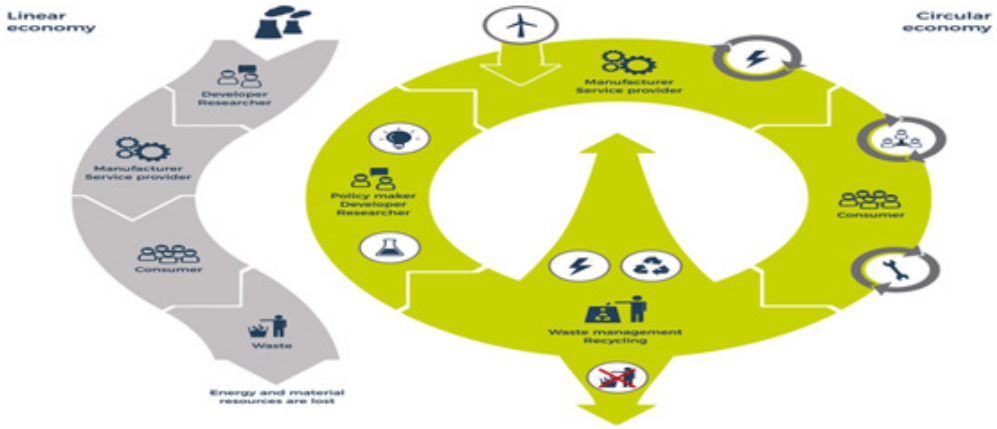
on Integrated Waste Management aligns with the concept of "zero waste," advocating for waste to be regarded as a resource and managed in accordance with principles of circular economies, prioritizing resource utilization and preservation. The Albanian government is actively engaged in waste management endeavors to fulfill obligations arising from revisions to EU Directives, including the ambitious objectives outlined in the Circular Economy Package. Achieving these objectives not only enhances environmental quality and public health but also catalyzes economic and social development, while paving the path towards European integration.

Transition from a linear economy to a circular economy

In contemporary discourse, distinguishing between linear and circular economies holds paramount significance, particularly for entrepreneurs seeking to initiate new production endeavors or optimize existing ones. While a linear economy conventionally generates waste during the production process, often leading to its non-utilization, a circular economy prioritizes waste elimination in favor of bolstering eco-sustainability throughout the production cycle. The prevailing economic growth paradigm over the past century and a half, termed the "linear economy," embodies an industrial, market-driven framework reliant on continuous extraction of raw materials, mass consumption, and waste generation upon product lifecycle completion, following a "take-produce-dispose" trajectory. During this era of economic expansion, concepts like recycling and reuse were scarcely considered, while environmental and social impacts remained peripheral concerns. It is evident that globally, the depletion of natural resources, coupled with escalating carbon emissions, persists unabated, alongside mounting waste accumulation and pollution (Velenturf & Purnell, 2017).

The transition to a circular economy represents a seminal paradigm shift and offers a tangible opportunity for restructuring production and consumption within the global economic framework, entailing a comprehensive reevaluation of market dynamics, consumer behavior, and resource utilization. Scholars such as De Pádua Pieroni et al. (2018) advocate for business model innovation as a cornerstone for effectuating this transition to a circular economy, emphasizing sustainability as a fundamental tenet. The European Parliament defines the circular economy as "A model of production and consumption that involves sharing, borrowing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible." Central to this strategy are the "3 Rs": reduce, reuse, and recycle.

FIGURE 1: Linear Economy vs Circular Economy



https://www.circular-flooring.eu/circular-economy/

Waste valorization denotes the process of transforming materials derived from waste into more beneficial products, encompassing chemicals, materials, and fuels. This concept has garnered considerable significance considering escalating waste generation and landfilling globally, prompting the imperative for sustainable and economically viable waste management practices (D. Arancon, Ki Lin, Chan & Kwan, 2013).

The "Zero Waste" (ZW) concept originated in the 1970s with its introduction by Paul Palmer, who founded Zero Waste Systems, recognizing the propensity of companies to discard clean, valuable chemicals that could be repurposed. The definition of ZW was subsequently delineated by the Zero Waste International Alliance, describing it as "The conservation of all resources through responsible production, consumption, reuse, and recovery of products, packaging, and materials, without incineration and without discharges to land, water, or air posing threats to the environment or human health." Initially popularized in the United States, the ZW approach has since gained global traction. This paradigm advocates for product redesign to facilitate multiple reuses of raw materials over their lifecycle until reaching optimal consumption levels. Within this framework, materials are not squandered but repurposed as inputs, obviating the necessity for further extraction of natural resources, thereby preempting new waste creation and conserving Earth's finite reserves (Bogusz, M., Matysik-Pejas, R., Krasnodębski, A. & Dziekański, P., 2021). The subsequent section will provide a comprehensive overview of select issues pertinent to waste management.

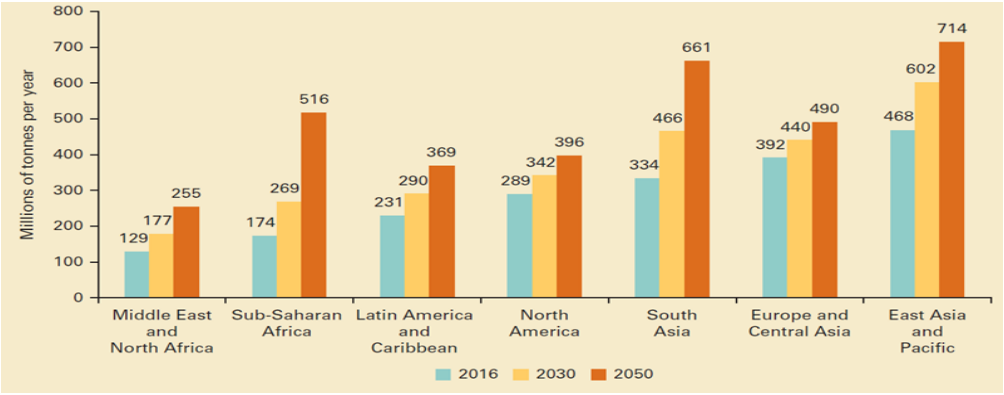
Methodology and data collection

A qualitative research endeavour was undertaken to scrutinize pertinent data, reports, and legislative frameworks. The study draws upon secondary data derived from diverse sources, including the World Bank, Eurostat, Instat Albania, EU legislation, and various reports. The examination in this paper centres on the discussion of select scientific articles and the analysis and observation of pertinent data concerning waste management practices in Albania and European Union member states. Through the meticulous analysis and observation of this data corpus, the research endeavours to address the overarching inquiry: How does Albania's approach to waste management compare to the prevailing standards within the European Union?

Some facts on waste management

The global magnitude of municipal solid waste (MSW) production is staggering, amounting to 2.01 billion tonnes annually, with a significant portion—approximately 33%—not subject to environmentally sound management practices. On average, everyone generates 0.74 kilograms of waste per day worldwide. Despite comprising merely 16% of the global populace, high-income countries contribute a disproportionate share, accounting for roughly 34% or 683 million tonnes of global waste output. Projections indicate a trajectory of substantial growth, with global waste volume anticipated to surge to 3.40 billion tonnes by 2050, surpassing the rate of population expansion over the same period. A discernible pattern emerges, evidencing a positive correlation between income levels and waste generation. Daily per capita waste production in high-income nations is anticipated to escalate by 19% by 2050, in stark contrast to low- and middle-income countries, where an increase of approximately 40% or more is projected. Notably, the most rapid escalation in waste generation is anticipated in Sub-Saharan Africa, South Asia, the Middle East, and North Africa, with anticipated tripling, doubling, and doubling, respectively, of total waste output by 2050. In these regions, over half of the waste is presently disposed of through open dumping practices, accentuating the urgent need for remedial measures to avert deleterious environmental, health, and socio-economic consequences.

GRAPHIC 1: Projected waste generation by region (millions of tonnes/years)

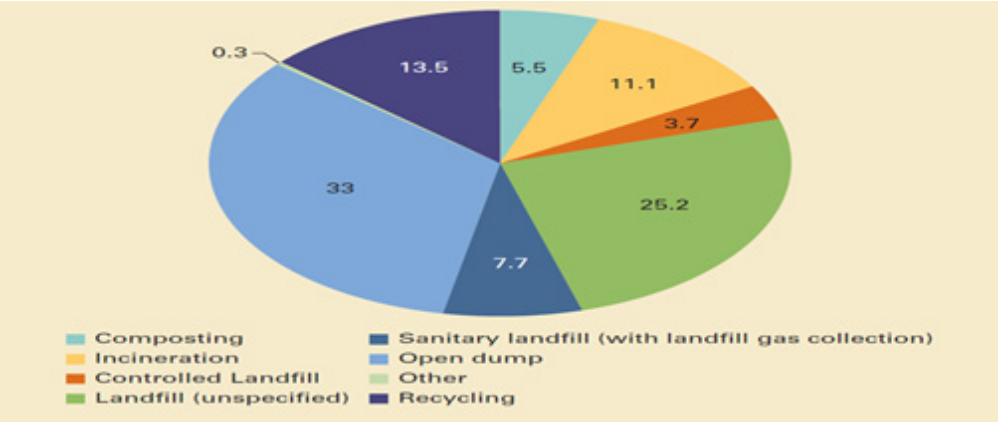


https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Globally, the predominant method of waste disposal remains landfilling, with approximately 37% of waste being consigned to various forms of landfills. Of this, 8% is allocated to sanitary landfills equipped with landfill gas collection systems. Open landfills constitute approximately 31% of the total waste disposal, while 19% undergo recovery through recycling and composting processes, and 11% is incinerated for final disposal. Effective waste management practices, such as controlled landfills or rigorously managed facilities, are predominantly observed in high- and middle-income countries. However, landfilling is not deemed an optimal solution due to its significant adverse impact on soil, water, air quality, and public health, primarily attributed to landfill leachate. The composition of leachate is influenced by various factors, including waste density and composition, climate conditions, and the age of the landfill (Khoiron, Probandari, Setyaningsih, Kasjono, Setyobudi & Anne, 2020).

Low-income countries predominantly rely on open dumping practices, with 93% of waste being disposed of in this manner, compared to a mere 2% in high-income countries. Notably, three regions—namely, the Middle East and North Africa, sub-Saharan Africa, and South Asia—dispose of over half of their waste through open dumping. Among upper-middle income countries, landfilling accounts for the highest proportion of waste disposal, constituting 54%. This percentage diminishes to 39% in high-income countries, with 36% of waste diverted for recycling and composting purposes, and 22% incinerated. Incineration is chiefly practiced in high-capacity, high-income, and land-constrained nations.

GRAPHIC 2: global disposal and treatment (percentual)



https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Complications of the Albanian system

One of the paramount environmental challenges confronting Albania pertains to waste management. In 2011, the Albanian government formulated a national strategy aimed at addressing this issue, aligning it with European legislative frameworks, given Albania's aspirations for European Union membership. This strategic initiative underscores the imperative of safeguarding public health, preserving the environment, and fostering economic prosperity, with waste management emerging as a primary policy priority. The enactment of legislation governing concessions and partnerships between the public and private sectors, as delineated in Law No. 77 of 16.07.2015, authorizes the provision of works and services for the management of municipal solid waste (MSW), encompassing collection, treatment, transport, and disposal. This legislative framework endeavors to enhance the efficacy of waste management policies.

Persisting challenges that have eluded resolution demand concerted attention. Foremost among these challenges is the absence of an efficient system for waste collection and separation, precipitating complexities in subsequent treatment and disposal phases, often culminating in landfilling and incineration. Notably, many Albanian municipalities lack reliable data pertaining to waste collection standards, exacerbating the efficacy of waste management efforts. Additionally, municipalities grapple with financial constraints impeding the waste collection process, rendering them unable to engage private entities for waste management services. Such constraints undermine the motivation and impetus to implement effective waste management strategies. Presently, waste collection in 13% of municipalities is facilitated by private operators, while 43% of municipalities rely

on in-house staff for this purpose. However, the availability of equipment for waste collection, including containers and trucks, is predominantly insufficient and in suboptimal condition, further compromising waste management endeavors.

FIGURE 3: Forecast of waste generated in different prefectures in Albania

Qarku	Parashikimi i sasisë së mbetjeve të grumbulluara			
	2018	2022	2027	2032
	[t/vit]	[t/vit]	[t/vit]	[t/vit]
Berat	26,516	28,010	29,679	30,874
Dibër	15,212	16,627	18,151	19,263
Durrës	84,703	92,839	103,772	115,614
Elbasan	49,120	53,542	58,817	63,430
Fier	54,557	59,809	66,187	71,992
Gjirokastër	14,674	15,398	16,269	16,934
Korçë	42,391	45,418	48,941	51,828
Kukës	11,114	11,968	12,915	13,678
Lezhë	24,016	26,495	29,500	31,768
Shkodër	42,490	45,847	49,899	53,348
Tiranë	278,345	312,167	359,150	411,808
Vlorë	54,544	59,603	66,147	72,659
SHQIPËRI	**697,681**	**767,723**	**859,428**	**953,196**

https://www.infrastruktura.gov.al/wp-content/uploads/2020/07/PLANI-KOMBETAR-SEKTORIAL-PER-MENAXHIMIN-E-MBETJEVE-TE-NGURTA.pdf

In terms of waste composition, organic matter constitutes 50%, followed by paper at 14%, plastic at 13%, metals at 1%, glass at 6%, and miscellaneous materials at 16%. Data reports indicate that only one-third of the waste generated in Albania is amenable to recycling. Over the past few years, several recycling initiatives have been initiated. Notably, Eco Tirana, a recent establishment in the capital city, is jointly owned by AGSM Albania Holding (49%) and the Municipality of Tirana (51%). Moreover, an estimated 12,000 individuals across Albania are engaged in the collection of recyclable materials from waste. A portion of the recycled materials are procured by private enterprises, numbering approximately 60 nationwide, which subsequently vend these materials to manufacturing companies for integration into their production processes. Due to the historical absence of waste segregation practices, many recycling firms have resorted to importing recyclable materials from foreign nations, including Italy, Greece, Macedonia, Serbia, Kosovo, and Turkey.

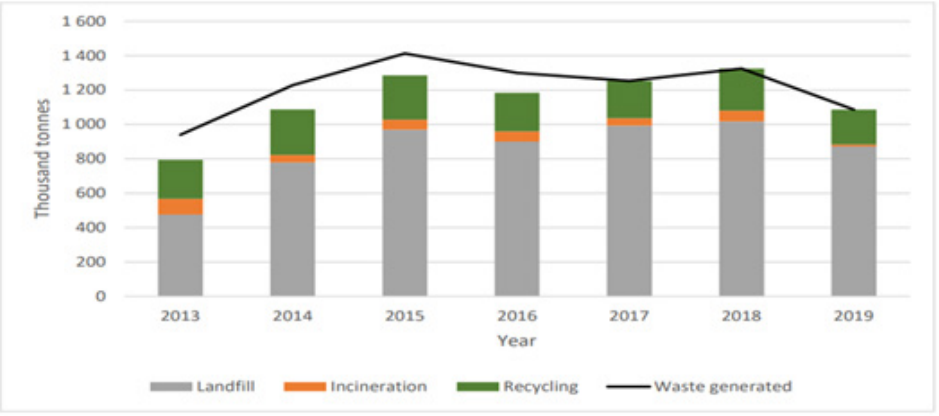
Furthermore, waste storage practices merit consideration. Efforts have been undertaken in recent years to establish specialized storage facilities that adhere to health and social standards, necessitating ongoing maintenance and monitoring to attain desired outcomes.

"Landfills and incinerators": the places that host waste in Albania

The existing waste management framework in Albania relies heavily on both legal and illicit landfill disposal methods. Efforts are underway to phase out illegal landfills and replace them with waste incinerators and sanitary landfills.

This transition entails the establishment of waste management zones, each equipped with at least one recycling facility and one residual municipal waste treatment plant. Presently, plans are in place to construct three incineration plants aimed at processing up to 30% of the total residual waste output. However, the implementation of these incineration facilities may give rise to logistical challenges and elevate waste management expenditures.

FIGURE 4: Generation of Municipal Solid Waste in tons and their treatment in Albania



Source: Eurostat (2021)

In Albania, several landfills exist, with the largest situated in the capital city of Tirana. The Sharre landfill spans an area of 22.5 hectares and boasts a capacity of 2,450,000 cubic meters, serving the urban centers of Tirana and Durres. Controversy surrounds this landfill, as many residents allege that the biogas emitted during decomposition contaminates water sources (particularly the Erzen river), soil, and permeates the air with unpleasant odors.

As part of its waste management strategy, the Albanian government has opted to pursue the construction of incineration facilities, with projected costs reaching up to 169 million euros. This substantial investment currently precludes consideration of alternative methodologies. Incineration presents a viable alternative to landfilling if implemented under suitable conditions and utilizing modern technologies. When efficiently managed, incinerators have the potential to generate electricity, which can be utilized in various processes. However, incomplete combustion during the waste incineration process poses the risk of releasing toxic and carcinogenic substances.

Presently, Albania hosts only one operational incinerator in the city of Elbasan, capable of processing approximately 120 tons of waste daily. However, incinerators in Tirana and Fier have yet to commence operations.

The role of environmental education

One of the most potent tools for fostering awareness and addressing environmental issues within communities is environmental education. Recognizing the interconnectedness of environmental, economic, and social dynamics has given rise to the broader concept of "education for sustainable development" (ESD). This approach not only addresses environmental concerns but also encompasses economic aspects such as poverty, consumption patterns, and inequalities, as well as social issues including peace, human rights, health, and cultural diversity. ESD encompasses all facets of life, promoting common values such as equity, respect for future generations, diversity, and the conservation of Earth's resources.

When examining Albania, a country rich in history and culture, it becomes evident that certain segments of the population remain entrenched in outdated mindsets that do not align with contemporary realities. As Albania undergoes rapid urbanization, it is imperative to instigate fundamental shifts in mentality towards sustainability.

Achieving this goal requires concerted efforts:

- Educational institutions at all levels play a pivotal role in promoting the values central to ESD. By expanding their mandate to include environmental education and incorporating robust environmental curricula, schools can equip future generations with the knowledge and skills needed to address environmental challenges effectively.
- Beyond educational institutions, various entities including businesses, organizations, and influential institutions should integrate educational programs and initiatives aimed at engaging the community in environmentally protective actions.
- Leveraging digital platforms, social media, and online spaces can ensure widespread dissemination of environmental awareness and education.

The overarching objective of these strategic actions is to embed environmental, social, and economic considerations into the daily activities of every citizen. Over time, this concerted effort will cultivate a culture that prioritizes the protection and sustainability of our planet and its inhabitants.

Conclusion

The impact of demographic growth and industrial advancement across centuries has led to a civilization characterized by rampant consumption, resulting in a rapid escalation of waste volume without proportional measures for its management. Hence, there arises a pressing need for transformative changes that prioritize both environmental sustainability and human well-being. It is imperative for each nation to adopt effective waste management strategies tailored to their actual waste output.

The European Union has been at the forefront of promoting sustainability, evident in its directives and initiatives aimed at transitioning towards a circular economy. This paradigm shift envisions a system with minimal resource extraction and waste elimination, where materials are efficiently separated and recycled. While many countries, including Albania, aspire to align with this vision, they still grapple with significant disparities in waste management compared to their EU counterparts.

Albania faces considerable challenges in achieving its waste management objectives. However, there are actionable solutions that could yield better outcomes:

- Raising public awareness through educational campaigns and initiatives.
- Implementing political frameworks that incentivize separate waste collection and consider waste composition.
- Exploring alternative waste disposal methods to reduce reliance on landfills.

While acknowledging the arduous journey ahead, it is crucial to recognize that there is still time to enact meaningful change. Despite the challenges, embracing adaptation and intervention can pave the way towards realizing a sustainable world that aligns with the aspirations of all individuals and fosters collective pride in the stewardship of our planet.

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