



Reforming Waste Management Laws In Pakistan: A Legal, Islamic, And International Perspective With Special Focus On Gilgit-Baltistan’s Emerging Framework

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ABSTRACT

This research critically examines the waste management system in Pakistan with a particular focus on Gilgit-Baltistan (GB). The study highlights the legal loopholes, the absence of enforcement mechanisms, and the socio-environmental challenges that are exacerbated by tourism and poor governance. Special attention is given to the GilgitBaltistan Waste Management Company (GBWMC), its establishment with new operational model, its dependence on Governmental Aid, and the systemic flaws in its approach for sustainability. Integrating Islamic environmental principles, international waste management conventions, and public policy reforms, the study provides actionable recommendations to create a sustainable, community-driven, and law-abiding waste management framework for GB. The research uses secondary data sources, comparative legal analysis, and thematic evaluation of international best practices to propose legal reforms that can be implemented in GB and extended to other regions of Pakistan.

Keywords: Reforming Waste Management Laws, Legal, Islamic, Gilgit-Baltistan’s Emerging Framework

Introduction

Waste management represents an urgent environmental, social, and governance challenge that has already become the focus of great concern throughout the world over the last few decades due to the fast-paced urbanization, industrialization, and the processes of increasing consumerism that describe the contemporary world. The nations of the world are busily trying to come up with a more efficient, sustainable, and legally solid waste management system in order to reduce the negative effects in the environment and the consequences of improper waste disposing. Nevertheless, other countries such as Pakistan are plagued by the inefficiency of legal systems, lack of proper implementation systems, and the overall failure to get the community involved in the process, all of which boils down to inefficient and unsustainable waste management systems [1].

In Pakistan, this is not a logistical problem, but a problem that runs deep into the institution and culture of the country. Each year, millions of tones of wastes are generated in the country; however, the current legal frameworks, including the Pakistan Environmental Protection Act (PEPA) of 1997 and the National Waste Management Policy of 2021, remain poorly enforced and frequently do not solve region-related problems [4][5]. Gilgit-Baltistan (GB) is one of the most affected regions as it is a region that stands out because of its administrative status, ecosystem, and a large number of incoming tourists. It is established that despite the fact it has been a main tourist attraction area due to its spectacular landscape beauty, GB has had serious threats of waste management generation in Gilgit Baltistan for the natural beauty and habitat of GB. The fact that some issue face by Gilgit Baltistan waste management company of effective and sustainable waste management

operations in GB due to no formal judicial frameworks, penalty-free society, and insignificant financial independence, a system in which littering and environmental degradation can be left unpunished, and the ideal of neglect and worsening can be sustained. The Gilgit Baltistan is represented by the most applicable waste management organization which is the Gilgit Baltistan Waste Management Company (GBWMC) with severe resource limitations, economic freedom, and unreserved access to the high-quality waste processing infrastructure [11]. It depends on the support of the government, hence diminishing its sustainability in the long term. Figure 1 shows a pie chart showing the approximate distribution of key waste management issues in Gilgit-Baltistan. It visually highlights how each problem contributes to the overall challenge.

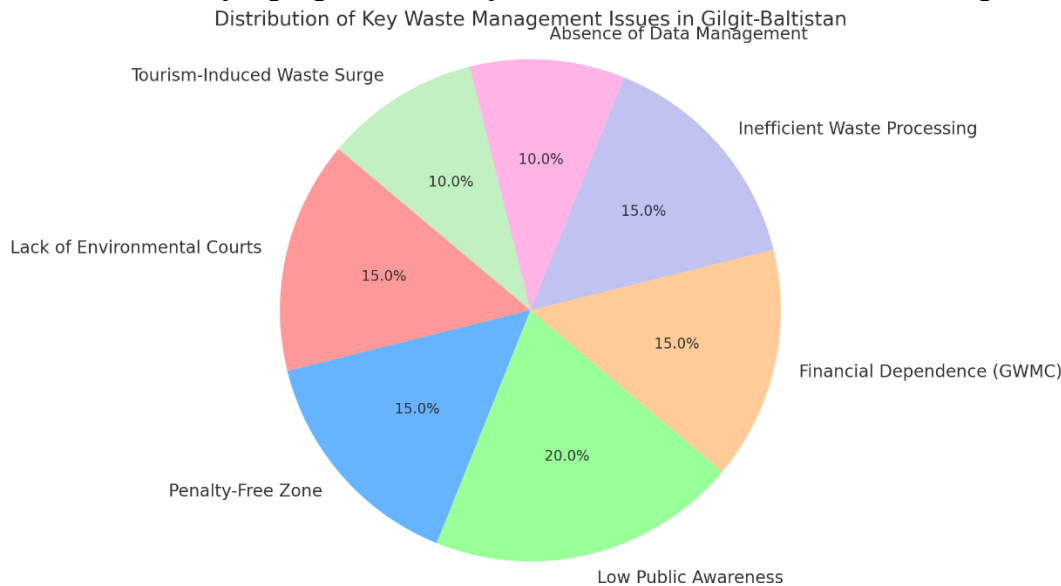


Figure 1: waste distribution

In addition to the inefficiency in law and administrative negligence, there is also an influence of the cultural and religious environment contributing to the formation of the existing attitude of people to waste management. The teachings of Islam encourage environmental responsibility and discourage wastage by positioning cleanliness as the central element of religion [6][7]. These principles provide a latent source of promoting community attitudes to environmental responsibility in GB with the strong traditions of Islam. Additionally, the disconnect between Pakistan's national policies and international waste management conventions, such as the Basel Convention and the Sustainable Development Goals (SDGs), further complicates the scenario. Global best practices from countries like Sweden and Japan demonstrate the effectiveness of integrated recycling, strict enforcement, and public engagement in achieving waste management excellence [10]. These models can serve as a valuable blueprint for GB if adapted appropriately to its socio-economic and cultural realities.

Hence, the aim of this study is to determine the multi-dimensional waste management issues in Gilgit-Baltistan as viewed legally, and through the Islamic, and the international perspectives. It critically evaluates the weakness of operations, financial and structural waste management operation, the social environmental states of lack of effective governance and the potential yet to be explored of the religious and community based interventions. The research will seek to present viable legal interventions, culturally appropriate public outreach initiatives as well as practicable waste-management solutions that can be pragmatically applied to GB and which can be conceivably extrapolated to other parts of Pakistan.

Literature Review: Waste Management in Pakistan

Pakistan produces about 3.9 million tones of plastic waste yearly and there is little recycling or efficient disposal processes [3]. PEPA 1997 is an environmental protection law in Pakistan and was passed to offer a guideline in protecting the environment; however, it lacks regional implementation enforcement areas such as GB [4]. The National Waste Management Policy 2021 focuses more on the integrated waste management, and yet its potential in GB was doubtful since there is no local legislative support available [5]. The papers emphasize that majority of urban waste management plans in Pakistan are partial, reactive and temporary collection based, not

the polyvalent processing and recycling. Moreover, most localities in the country, especially in remote areas such as GB, are faced with a shortage of resources, inefficient infrastructure.

But the GBWMC, has provided enough human resource management as depicted in the chart, "HUMAN RESOURCE DISTRIBUTION" could pertain to the Gilgit-Baltistan Waste Management Company (GBWMC), a key entity responsible for solid waste management in the Gilgit-Baltistan region of Pakistan. Given that Skardu and Gilgit are prominent cities within Gilgit-Baltistan and are listed as units in the table, it's plausible that this data reflects the staffing and departmental structure of GBWMC's operations across various areas it serves. The diverse roles of Manager, DMO, Supervisor, Operator, Worker, and Mechanic—align with the operational needs of a waste management company, which would require administrative oversight (DMO, Supervisors), direct operational staff (Operators, Workers for collection), and maintenance personnel (Mechanics for vehicles and machinery).

Islamic Perspective on Environmental Protection

Islamic teachings place significant emphasis on cleanliness and environmental stewardship. The Prophet Muhammad (PBUH) stated, "Cleanliness is half of faith" [6]. The Quran promotes the avoidance of waste: "Indeed, the wasteful are brothers of the devils" (Quran 17:27) [7]. These principles advocate not only personal hygiene but collective responsibility for the environment. Studies on Islamic environmental ethics suggest that Islam encourages moderation, conservation of natural resources, and protection of public spaces. However, despite the richness of these teachings, there is a substantial gap in their practical implementation in environmental governance frameworks in Pakistan, including GB. The absence of religiously inspired environmental campaigns in GB represents a missed opportunity to leverage local religious values for promoting sustainable waste practices.

International Waste Management Practices

The international conventions like Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, sustainable development goals (especially goal 12) and United Nations Environment Programme (UNEP) recommendations have very elaborate protocols in waste management [8][9]. Sweden and Japan among other countries have proved that combinatory recycling and enforced measures can greatly bring down wastage and foster sustainability [10]. The comparative analysis indicates that these nations implement a mixed approach that consists of enforcement of the law, education and mass education, economic empowerments and increased technology, which help them achieve a high rate of waste recycling. Specifically, the Japanese approach focuses on using stringent household sorting schemes combined with penalties, whereas, Swedish waste-to-energy facilities make it possible to reduce reliance on landfills. Literature emphasizes that these effective models are based on participation of people, constant funding sources, and straightforward legal requirements, most of which do not exist in the current Pakistani waste management system.

Challenges in Gilgit-Baltistan

GB faces unique challenges: the region lacks judicial institutions, has minimal local governance, and operates as a penalty and tax-free zone, limiting the enforcement of environmental laws [2]. Tourism, which is a major economic driver, contributes heavily to the waste problem, yet there are no stringent policies or public engagement strategies in place. Studies indicate that GB's fragile ecosystem is particularly vulnerable to pollution, with plastic waste from tourist hotspots accumulating in rivers, valleys, and mountain passes. Additionally, the transitory nature of the tourist population exacerbates the challenge, as visitors often disregard environmental norms due to the absence of penalties. The literature also highlights the administrative vacuum in GB, where government agencies operate without adequate coordination or long-term strategic planning.

The Role of Gilgit Baltistan Waste Management Company (GBWMC)

GBWMC was initiated to deal with waste within Gilgit Baltistan and the nearby tourists attractions. The Gilgit-Baltistan government administratively runs it and is almost entirely funded by government contributions [11]. GBWMC mainly targets on collecting and transportation of 10 District of Gilgit Baltistan. After effective waste collection and transportation operation GBWMC now focused on proper disposal of waste through recycling activities in Gilgit Baltistan and successfully initiated recycling activities in Gilgit, Skardu and Hunza. GBWMC also initiated project for establishing sanitary landfill sites in all districts with recycling facilities [12].

Systemic Flaws

Lack of a financial independence is one of the major problems of GBWMC. Government funding is a strong base of the company, there exists no system of tax collection, punishment, or the contribution of the private sector to maintain sustainability [13]. Besides, the littering of streets and waste mishandling are not punishable by the law because there are no local courts, which results in apathy among the population towards sanitation [2]. Its financial unsustainability implies that the GBWMC will not be able to carry out any investments in new equipment, training measures, and outreach programs. Most of the collected garbage is not treated and is disposed openly, which is very risky to both the environment and health hazard [14].

Operational Capacity and Human Resource Structure of Gilgit-Baltistan Waste Management Company (GBWMC)

The Gilgit-Baltistan Waste Management Company (GBWMC) is a regionally significant organization tasked with managing the growing waste problem across the ten districts of Gilgit-Baltistan. Despite its commendable outreach and dedicated workforce, the company's existing resources are increasingly strained due to the escalating waste volumes driven by rising tourism and urbanization. A deeper examination of its manpower, logistics, and sustainability challenges reveals both strengths and critical gaps that demand immediate policy intervention.

1. Human Resource Allocation

The Government of Gilgit-Baltistan has provided a total of **611 employees** to the GBWMC. This workforce comprises a blend of officers, supervisors, and sanitary workers, distributed across multiple districts. The current human resource breakdown indicates the following:

- **Officers:** Responsible for planning, administrative coordination, and field oversight. Their role is pivotal in ensuring that district-level waste management activities align with national and regional policies.
- **Sanitary Workers:** These frontline employees are tasked with the manual collection, transportation, and basic segregation of waste materials.

Although the number appears substantial, when divided across **10 districts**, it becomes evident that the employee-to-population ratio, especially in high-tourism areas, is insufficient to handle peak waste loads efficiently. Seasonal surges in waste due to tourism further exacerbate this gap, necessitating the recruitment of temporary or contract-based workers during high-demand months.

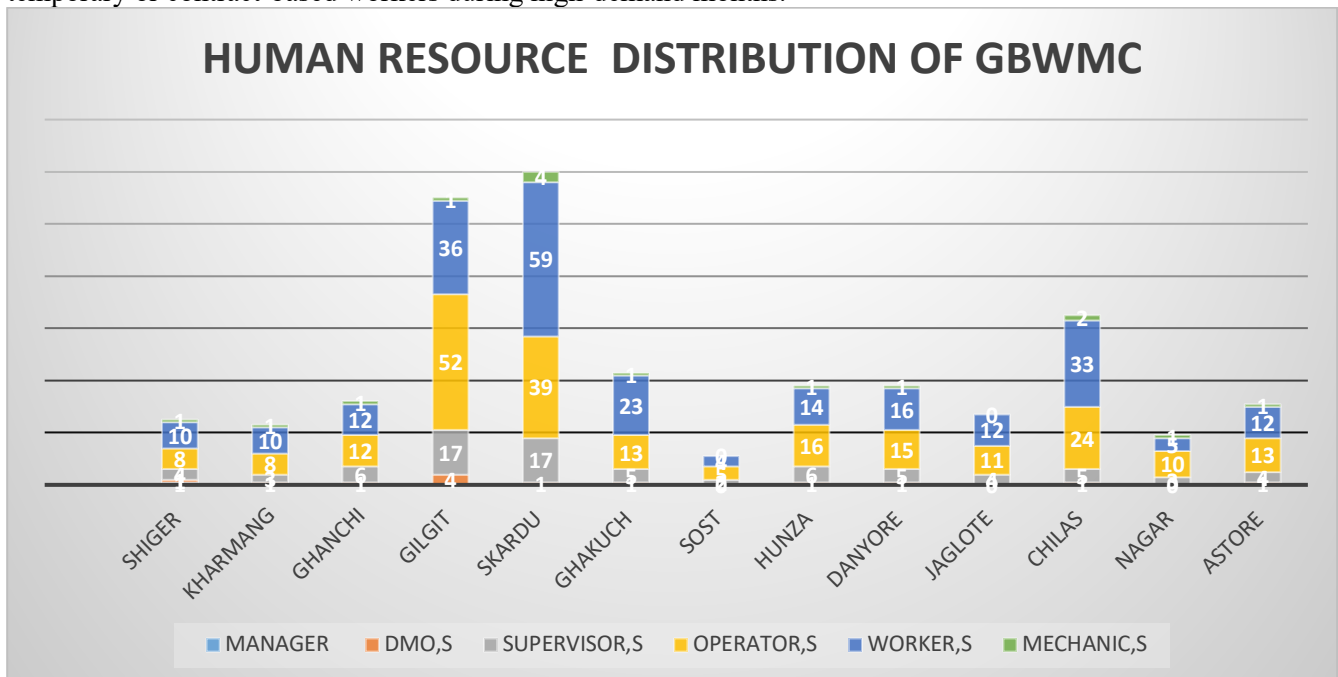


Figure 2: HR distribution along 10 districts

2. Waste Collection Fleet

GBWMC currently operates **245 waste collection vehicles** that serve all districts of Gilgit-Baltistan. These vehicles are critical for daily waste collection, transportation to dumping sites, and emergency clean-up operations in congested tourist zones.

However, considering the geographical complexity of GB, which includes mountainous terrains and remote valleys, the fleet size is modest. Many villages and tourist destinations remain either partially serviced or completely unreachable due to the limited availability of specialized waste transport vehicles capable of navigating challenging terrains. Additionally, the absence of advanced waste handling machinery (such as compactors and recycling trucks) further restricts operational efficiency.

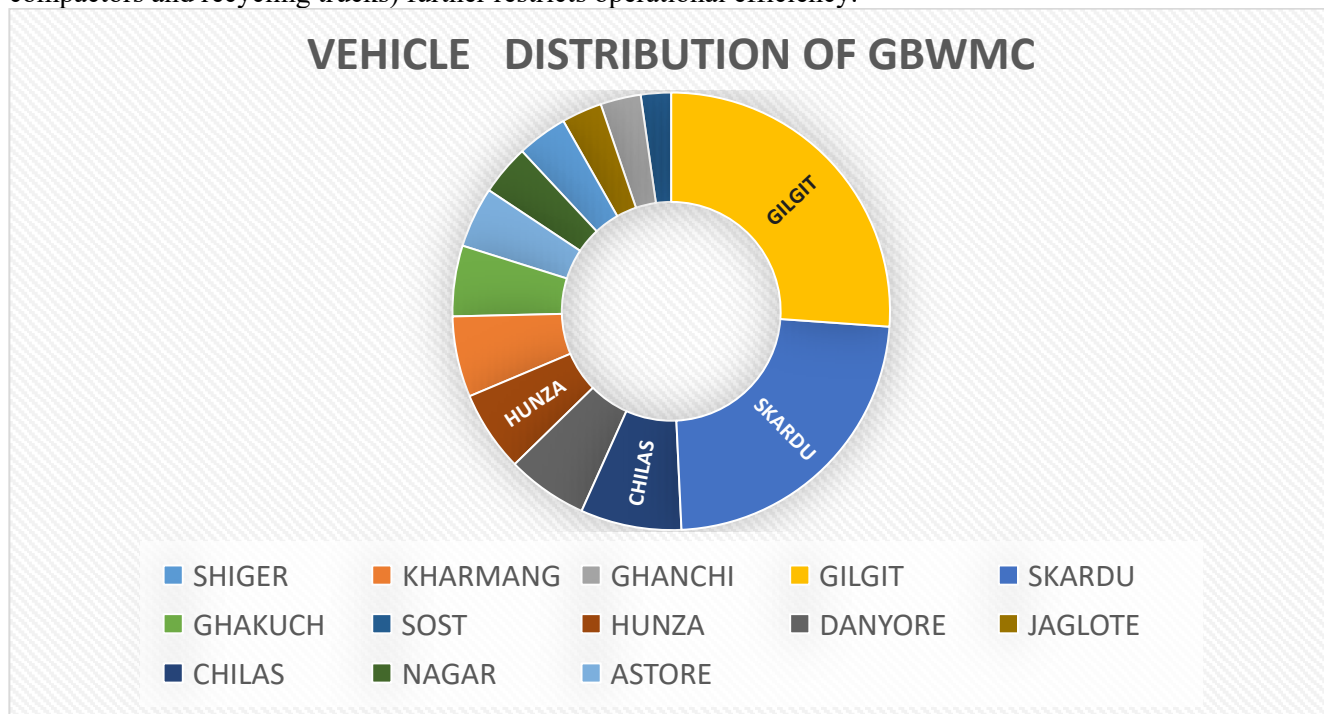


Figure 3: vehicle distribution along different districts

3. Structural Outreach: Units Across Districts

GBWMC has established **13 operational units** strategically located across the **10 districts** of Gilgit-Baltistan. This regional network theoretically positions the company to manage waste generation at a decentralized level, allowing for more localized and responsive waste management solutions.

4. The Urgent Need for Sustainable Expansion

The existing structure and resource base of GBWMC, though commendable in scale, are not sufficient for long-term sustainability. Immediate steps are required to ensure the company can evolve into a self-sustaining entity capable of efficiently managing the region's growing waste challenges. Recommended strategies include:

- **Investment in Modern Equipment:** Acquisition of specialized waste collection and processing vehicles suited to mountainous terrains and high-volume tourist areas.
- **Public-Private Partnerships (PPP):** Engaging private sector stakeholders to introduce innovative waste processing solutions and to share the financial burden.
- **Training and Capacity Building:** Continuous skill development programs for employees to enhance operational efficiency and environmental awareness.

By focusing on these sustainability-driven reforms, the GBWMC can transition from a government-dependent body to a more autonomous, accountable, and technologically advanced waste management system. This transformation is essential not only for the environmental health of Gilgit-Baltistan but also for preserving the region's status as a premier tourist destination.

Legislative Recommendations for Regulating Waste Management in Gilgit-Baltistan

In a bid to eliminate the lingering waste disposal challenges, in Gilgit-Baltistan (GB), the government must implement all inclusive laws that will not only be targeting same locals, but also the multinational corporations (MNCs) operating in the area. Effective legal systems backed with an effective implementation machinery will play an important role in sustainable waste management and environmental protection in this ecologically fragile region.

1. Environmental Taxation and Tariff System for Local Businesses and Multinational Companies

The government ought to consider the implementation of environmental taxation policy that has been targeted at causing both local and multinational companies to be liable to the impact they have on the environment. Such levies and duties can be:

- **Waste Generation Tax:** Businesses producing high volumes of waste need to be taxed on the quantity as well as nature of waste disposed. It will establish a monetary incentive to businesses to work towards sustainable production and packaging.
- **Import Tariffs on Non-Recyclable Materials:** Multinational companies importing non-biodegradable or hard-to-recycle materials should be subjected to higher import tariffs. This measure will encourage the use of eco-friendly alternatives and reduce the influx of plastic and hazardous waste into the region.
- **Corporate Social Responsibility (CSR) Mandates:** the government will have the right to ask MNCs and other large enterprises in the country to contribute a certain percentage of their profit to the local waste management projects, recycling infrastructure facilities, and also to community education plans.
- **Sustainability Certification Fees:** Firms which achieve set-high standards of waste reduction as well as recycling are eligible to apply to sustainability certifications including abolished tax or other fringe benefits, thus facilitating corporate responsibility.

These fiscal inputs will not only help in bringing financial viability of the Gilgit Baltistan Waste Management Company (GBWMC) but also help in inculcating the culture of environmental responsibility amongst the firms operating within the region.

2. Penalty and Ban System for Unmanaged Waste Disposal

Strict penalties and restrictions must be introduced to limit the high-littering rates of residents and visitors in GB. It is advised to follow the below:

- **On-the-spot penalty on littering:** Offenders of littering and leaving garbage carelessly in the street should be fined on the spot and this should be implemented by environmental officials or the local government authority.
- **Repeat Offender Penalties:** Tourists or locals who repeatedly violate waste disposal regulations should face escalating penalties, which may include community service in waste management operations.
- **Temporary Bans for Tourists:** Tourists who are documented to have littered protected areas, tourist hotspots, or heritage sites may face temporary entry bans into GB for a specified duration.
- **Public Naming of Offenders:** There can be a list of harsh or frequent offenders that are publicly kept, which can work as a deterrent, in accordance with laws that guide the privacy of the people.
- **Community-based Waste Management Ordinances:** Community based penalties and restriction should also be imposed on the prohibited items and accordingly the community based waste management ordinances should be issued by the municipal authorities.

The establishment of such regulatory measures will enable the government to enhance the level of accountability to the masses, diminish environmental destruction and create an atmosphere of collective responsibility towards sustaining the purity of Gilgit-Baltistan.

Sustainable Growth in Gilgit-Baltistan: The Case for Environmental Taxation Along CPEC

The China-Pakistan Economic Corridor (CPEC) is a major infrastructure initiative that has brought new roads, energy projects, and trade opportunities to Gilgit-Baltistan. The expansion of the Karakoram Highway, development of Gwadar Port, and improved connectivity through Sost and Khunjerab Pass have boosted regional integration and tourism.

However, rapid development has led to environmental pressures such as deforestation, increased waste, and pollution in fragile ecosystems. Gilgit-Baltistan faces the challenge of balancing economic growth with environmental protection. Sustainable development requires strong safeguards, improved waste management, and capacity building alongside infrastructure growth.

To meet these challenges, the Gilgit-Baltistan government should enact a law introducing an Environmental Road Usage Fee. A key part would be the Green Infrastructure Maintenance Tax (GIMT) — a fee on cargo trucks, buses, and tourist vehicles using CPEC roads. Funds would be ring-fenced exclusively for road cleaning, waste management, and ecosystem restoration.

Efficient collection could be ensured through toll booths or digital checkpoints with e-invoicing at strategic points such as Diamer, Jaglot, and Sost (Khunjerab Pass). Additionally, an Environmental Protection Fee for non-local tourists could be collected through hotels, guesthouses, or official checkpoints operated by NATCO, local police, or tourism authorities. Revenues would support local waste management efforts, managed by municipalities or NGOs like CEPAC.

A third measure, the Heavy Vehicle Environmental Levy, would charge CPEC cargo vehicles based on weight, emissions, and cargo type, addressing their environmental impact. Together, these policies would help ensure CPEC's economic benefits do not come at the cost of Gilgit-Baltistan's fragile environment. With these measures, the region can achieve sustainable prosperity and become a model for responsible development in Pakistan.

Global Examples of Environmental Transport Taxes

Around the world, countries use transport-related environmental taxes to fund infrastructure, reduce pollution, and promote sustainability. These systems follow the “polluter pays” principle, holding users accountable for environmental impacts.

Switzerland – LSVA Heavy Vehicle Fee

Charges on freight trucks based on distance, weight, and emissions fund road upkeep and environmental protection.

Norway – Urban and Highway Tolls

Tolls targeting diesel and non-electric vehicles support public transport and urban waste systems.

Bhutan – Sustainable Tourism Fee

Tourists pay a daily levy that supports conservation, waste management, and local development.

New Zealand – Road Charges & Waste Levy

Road user charges on heavy vehicles and a national waste levy fund recycling and pollution control.

India – Green Tax on Older Vehicles

Tax on polluting commercial vehicles funds environmental projects and road maintenance.

Kenya – Environmental Levies & Park Fees

Revenues from plastic bag bans, tourism levies, and park fees support conservation via the National Environmental Trust Fund.

When transparent and legally enforced, these taxes gain public support and deliver real environmental benefits. This is not a new idea but a proven approach successfully implemented worldwide, showing that Gilgit-Baltistan can adopt similar measures to sustainably manage its environmental challenges while fostering economic growth.

Results and Findings of Legal Gaps

Their lack of an environmental court in GB, which has greatly limited the enactment of national environmental policies. There is no localized judicial system that can interpret and enforce these policies in case of environment-related violations thus making them unchallenged and the violators to attract no legal consequence. Such a lack of it compromises the whole regulatory system and it gives rise to a culture of non-conformance. Moreover, the absence of a proper system of penalties leads to a low level of responsibility in the eyes of the population, and because of it, people are unlikely to be afraid of penalties when improper waste disposal because there are not, in fact, any [2]. This spins a very unhealthy cycle and the generation of waste goes on unabated and the regulatory and enforcement agencies do not have the powers to do much to reduce the menace.

Public Awareness Deficit The study also reveals a profound public awareness deficit in GB. There is minimal public participation in waste management initiatives, which can largely be attributed to the absence of sustained

awareness campaigns, educational programs, and community-based waste reduction efforts [15]. Both tourists and locals contribute heavily to the region's littering problem, with limited understanding of the long-term environmental damage being caused. The lack of visible community ownership of waste management further perpetuates the issue. Surveys and field observations indicate that many residents view waste management as solely the responsibility of the government or GBWMC, rather than a collective civic duty. This disconnect has eroded any sense of environmental responsibility within the community.

Discussion Legal Reforms

Because of the systematic problems in GB, it is necessary to establish an environmental tribunal in the region. Introducing consequences that can be enforced in case of littering and mismanagement of waste can be key to enhancing the compliance of the population [16]. The local structures of governance should be able to institute and collect the environmental taxes that may be used to finance the waste management activities on its own. The Enforcement of Islamic Environmental Ethics Incorporation of the Islamic teachings in the social awareness campaigns undertaken in society can become an effective method in the relatively cultured and religiously oriented society of GB. Community involvement can be reinforced with messages that state that it is the religious responsibility to protect the environment [6][7].

International Best Practices GB can adopt elements from successful international waste management models. Sweden’s Waste-to-Energy (WTE) initiatives and Japan’s strict segregation policies can be localized to fit GB’s socio-economic conditions [10]. The implementation of community-based recycling programs, as seen in developing countries like Rwanda, can also be beneficial [17]. Public Engagement Strategies Mandatory environmental education in schools, media campaigns, and active involvement of local influencers can increase awareness and foster a sense of shared responsibility among residents and tourists [15].

Table 1: Summary of Key Issues and Reform Strategies for Waste Management in Gilgit-Baltistan

Key Issue	Description	Proposed Reform
Lack of Environmental Courts	No judicial body to enforce environmental laws.	Establish local environmental courts or tribunals.
Penalty-Free Zone	Absence of fines encourages public negligence.	Implement penalty systems and enforce regulations.
Low Public Awareness	Minimal educational campaigns on waste management.	Launch community-based awareness and Islamic-driven initiatives.
GBWMC’s Financial Dependence	Fully reliant on government aid .	Introduce local taxation, public-private partnerships, and user fees.
Inefficient Waste Processing	No recycling, segregation, or composting facilities.	Invest in advanced recycling equipments.
Tourism-Induced Waste Surge	Seasonal influx increases litter and unmanaged waste.	Introduce tourist education programs and waste management stations.

Conclusion and Recommendations

The Waste management system existing in Gilgit Baltistan and specifically the Gilgit Baltistan Waste Management Company (GBWMC), is financially unsustainable. The absence of courts and punishment exacerbates the situation and people remain indifferent and the tourist wastes are being put on the scarce resources. It is imperative to make necessary legal reforms that bring enforceable penalties, come up with environmental courts and introducing environmental tax. Community participation can also be improved with the help of public awareness campaigns conducted on the basis of Islamic teachings and best international practices. Besides, GBWMC ought to pursue financial self-sufficiency, involving the commercial sector, and implementing new technology in processing the wastes.

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