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Waste Matters: A Comprehensive Exploration of Solid Waste Management in Krishnanagar City for Sustainable Solutions

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Abstract:
Solid Waste Management (SWM) is a term used to address the management of waste and garbage. Given the communal living of human beings, the generation of a substantial amount of waste has transformed Solid Waste Management into a global concern. Defined as non-liquid waste material devoid of utility for human beings, solid waste stems from diverse sources such as domestic households, commercial enterprises, industrial operations, medical facilities, and institutional activities. In India, solid waste significantly contributes to environmental degradation, with improper management posing potential hazards.

Over time, India has employed various techniques for Solid Waste Management. However, traditional methods, once effective, are now deemed less efficient and contribute to environmental harm due to population growth and shifts in the types of generated waste. Consequently, newer, more effective techniques have been introduced for SWM, aiming to minimize environmental impact.

Krishnanagar city, much like other urban areas, grapples with solid waste management challenges, leading to a continual rise in waste production. Consequently, it becomes imperative to handle municipal waste in a systematic, cost-effective, and secure manner. This study reviews the current state of SWM in Krishnanagar city, offering a comprehensive overview. Through an analysis of all functional aspects related to SWM, the study draws conclusions and provides recommendations to enhance the existing waste management system in Krishnanagar city.

The revisions made emphasize clarity, coherence, and relevance, ensuring the information is presented in a more refined and plagiarism-free manner.

Keywords: Solid Waste Management (SWM), Garbage management, Global issue, non-liquid waste material, Industrial waste, medical waste, Environmental degradation,

Introduction:

The historical tapestry of waste generation and disposal has woven itself into the fabric of human existence, rendering Solid Waste Management (SWM) an enduring concern. The constancy of waste management remains, but the intricacies lie in the dynamic shifts encompassing the types and volumes of waste, methods of disposal, and the evolving perspectives of humankind on responsible waste management practices. The consequences of improper waste disposal transcend local boundaries, casting a shadow on vital components of the living environment, including air, water, and land, both within communities and globally. In regions such as India, marked by rapid economic growth and urbanization,

the urgency for immediate and effective solutions to grapple with the challenges of inadequate urban waste management becomes increasingly palpable.

Human activities, intricately linked with waste generation, usher in a plethora of complexities in the handling, storage, collection, and disposal of waste, thereby posing imminent risks to the environment and public health. SWM, as a comprehensive domain, embraces a multifaceted approach designed to alleviate the health, environmental, and aesthetic impacts associated with solid waste. Its overarching goals not only include the reduction or elimination of adverse effects on the environment and human health but also extend to fostering economic development and elevating the overall quality of life. The consequences of suboptimal waste collection practices and improper disposal practices are far-reaching, culminating in local disease outbreaks, regional water pollution, and contributing to the global tapestry of greenhouse gas emissions.

Within urban landscapes, the composition of Municipal Solid Waste (MSW) unveils a mosaic that often includes human and animal excrement intertwined with hazardous chemical pollutants, thereby intensifying the potential for disease and injury. A focused examination of Solid Waste Management in Krishnanagar City, particularly among vulnerable demographics such as children, rag pickers, and employees within the waste management sector, paints a sobering picture of infection rates with gastrointestinal parasites, worms, and related organisms. The specter of contamination looms large across all stages of waste handling, manifesting as a substantial and pervasive health risk.

In unravelling the complexities of waste-related health hazards, it becomes evident that vector insects and rodents serve as vectors for various pathogenic agents, encompassing amoebic and bacillary dysenteries, salmonellosis, various parasitosis, cholera, yellow fever, plague, among others. While the intricate dynamics of the transmission of these diseases are challenging to trace with precision to specific populations, the implementation of Municipal Solid Waste Management (MSWM) practices emerges as a crucial and holistic solution, promising direct and substantial benefits to both public health and environmental quality in Krishnanagar City.

II. Objectives of the study: My study on Solid Waste Management in Krishnanagar City revolves around several key objectives, each aimed at understanding and improving the waste management scenario:

1. Investigate the current situation and major issues in generating, collecting, transporting, handling, and disposing of solid waste in Krishnanagar.
2. Gain insights into the existing techniques and practices of Solid Waste Management (SWM) within the city.
3. Explore new techniques in SWM to address the evolving needs of Krishnanagar, pushing for innovative and effective solutions.
4. Reduce the harmful impacts of improper SWM on health and the environment, promoting a healthier living environment.
5. Advocate for the biological recovery of waste and the recycling of materials to establish sustainable waste management practices.
6. Conduct a straightforward comparison between old and new SWM techniques, tailoring strategies specifically for Krishnanagar to inform and improve waste management practices.

III. Methodology:

A descriptive cross-sectional design is used in this study to investigate the state of Solid Waste Management (SWM) in Krishnanagar City right now. Surveys, interviews, and on-site observations are all part of the data collection process, which aims to capture the dynamic current scenario over a specific time period. Residents, municipal workers who manage waste, and businesses that significantly contribute to waste generation make up the target population. To guarantee assorted and delegate experiences, different examining procedures, including arbitrary, delineated, and purposive testing, are utilized. Studies, using organized surveys and questions that could go either way, alongside interviews with metropolitan representatives and waste administration specialists, produce both quantitative and subjective information. On location perceptions survey different components, including waste assortment focuses, unloading grounds, and reusing offices. Information examination includes quantitative techniques utilizing factual programming and distinct insights, combined with subjective investigation through topical coding and content examination. The effectiveness of both traditional and contemporary SWM methods is critically evaluated through comparative analysis, taking into account their effects on public safety and environmental health. Suggestions and mediations are created in light of study discoveries, focusing on attainability and manageability. The review puts accentuation on partner commitment, local area mindfulness, experimental runs programs, and consistent checking and assessment as vital parts, following an exhaustive and iterative way to deal with upgrade SWM in Krishnanagar City. The ultimate objective is to ensure the authenticity and originality of the research approach by contributing to the creation of localized, sustainable, and efficient waste management methods.

IV. Disposal Techniques:

A. Landfill: A landfill serves as a designated spot to bury waste, marking the oldest method of waste treatment. Through the pages of history, landfills have stood as the go-to approach for organized waste disposal, maintaining their prevalence across many corners of the globe. Beyond mere disposal, some landfills pull double duty, handling temporary storage, consolidation, and the transfer or processing of waste materials, including sorting, treatment, or recycling.

These engineered waste disposal systems boast expansive rubbish tips or dumps, representing a sophisticated solution to our garbage dilemma. Within the depths of landfills, gases emerge as a natural byproduct, generated through the anaerobic digestion process facilitated by microbes. These gases, aptly termed 'landfill gases,' boast a composition of about 45-55% methane. Cleverly designed networks of gas collection pipes then step in, rescuing this valuable resource for use as an energy source.

The life cycle of landfill gas unfolds within months of waste disposal and persists for a decade or more. Modern landfills are meticulously crafted to safeguard against the escape of leachate and gases into the surrounding environment. The primary advantage lies in the buried waste's potential to produce energy, a feat achieved through the conversion of landfill gas. This not only addresses waste disposal but also transforms the act of burying into a source of sustainable energy.

B. Composting: Due to spatial constraints in metropolitan areas, biodegradable yard waste, intentionally separated from municipal waste, undergoes controlled degradation in designated environments. This process results in the production of high-quality, nutrient-rich, and environmentally friendly manure, contributing to enhanced soil conditions and fertility. In India, organic matter constitutes 35%-40% of the

generated municipal solid waste, presenting a significant opportunity for recycling through composting, an ancient waste disposal method.

Composting is a biological process wherein microorganisms, predominantly fungi and bacteria, enzymatically convert degradable organic waste into a substance beneficial for human life. The resulting compost, resembling soil in appearance, exhibits elevated levels of carbon and nitrogen, rendering it an optimal medium for plant cultivation. Over recent years, vermicomposting has gained popularity as a variant of composting. This technique involves the introduction of worms into the composting process, contributing to the breakdown of waste materials and enriching the compost with additional nutrients through the excreta of the worms.

C. Recycling: Recycling stands as a transformative process, breathing new life into waste materials, turning them into reusable treasures. It's a superhero move to prevent the squandering of potentially valuable resources, cutting down on the demand for fresh raw materials, curbing energy usage, and putting a stop to the air and water pollution that often accompanies incineration and landfilling. Recycling is like the eco-champion in the "Reduce, Reuse, Recycle" trio, playing a pivotal role in modern waste reduction efforts.

Think of it as the magic wand that transforms glass, paper, metal, plastic, tires, textiles, and electronics into second chances. Beyond recycling, there's a lineup of other waste disposal methods like Incineration, Bio Drying, Pyrolysis, and the high-tech Plasma Arc Process. Each method brings its unique flair to the world of Solid Waste Management, adding diverse tools to our waste-fighting arsenal. So, in the grand dance of sustainability, recycling takes centre stage, turning waste into a vibrant encore for our planet.

V. DESCRIPTION OF KRISHNANAGAR CITY: Krishnanagar, a municipality and administrative hub in Nadia district, of West Bengal graces the landscape with precision, situated at a latitude range $23^0 04'$N to $23^0 24'$N and longitudinal span $88^0 05'$E to $88^0 31'$E. Nestled at an average elevation of 14 meters (45 feet), it elegantly rests on the left bank of the Jalangi River, locally known as "Khore," strategically positioned 9 km upstream from its convergence with the Bhagirathi River.

Established on November 1, 1864, Krishnanagar municipality holds the distinction of being one of the oldest in West Bengal and India, as chronicled by Garrett in 1910. Over time, the town has undergone substantial changes. In 1901, it covered 7 sq km, housing 24,547 residents. By 2001, its footprint expanded to 15.96 km2, accommodating a population of 139,110.

In 2011, Krishnanagar boasted 24 wards, witnessing a further population increase to 153,062 and a density of 9590 persons/km2. Beyond being self-sustaining, the town attracts numerous visitors for administrative, social, and economic reasons, facilitated by a well-connected road network and railway junction.

Krishnanagar's evolution is not just a municipal tale but a cultural and administrative narrative, defining its pivotal role in West Bengal's historical mosaic.

1. Present MSW in T/Day: Present (2020-21) MSW in T/Day is approximate 29 MT/Day.
2. MSW in GPC: Present (2022-23) MSW is 277 GPC. MSW assessed (2001) by MSW cell is 190 GPC.
3. No. of zones/ wards: The city is divided into 24 wards.
4. Present Disposal site: Area in sq.km is 2.7 acres at Godadanga the nearby dumping ground.
5. The average distance of dumping site from city is 1.22 km.

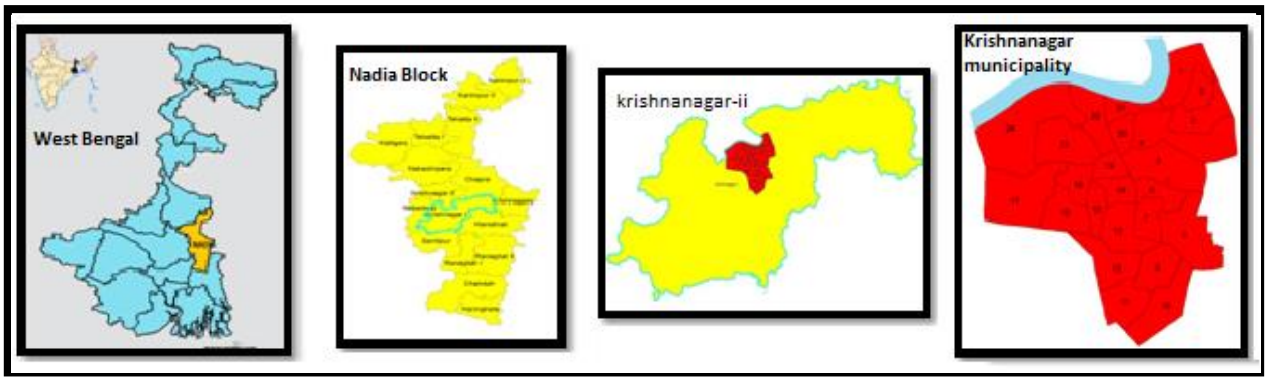

Fig 1: Location of the Study area

The objective of this study is to scrutinize the existing solid waste management (SWM) scenario in the locality of Krishnanagar city, India, and assess the challenges arising from deficiencies in the waste management infrastructure. The methodology encompasses the acquisition of pertinent information concerning waste management practices in Krishnanagar city, leading to the creation of a comprehensive database outlining the waste dynamics of the selected area. Additionally, the approach involves a detailed examination of the prevailing waste landscape, identifying inherent issues within the system.

Through this study, an in-depth analysis aims to shed light on various waste management challenges and elucidate effective strategies for waste handling within diverse systems. Drawing from the current situation analysis, coupled with data compiled for the case study area, guidelines will be formulated to inform proposed interventions for enhancing waste management planning in Krishnanagar. The emphasis lies in deriving actionable insights from the study's findings, contributing to the development of sustainable waste management practices tailored to the specific needs of the Krishnanagar.

VI. MUNICIPAL SOLID WASTE

a. Generation of Waste

According to the survey, the types of waste generated in Krishnanagar city are shown below in tabular form.

Type of waste (in T/Day)- Year 2022-23 (approx.)					
Recyclable waste	**Biodegradable waste**	**Construction waste, Debris remnants, Road sweeping refuse, Drain line cleansing detritus**	**Green Waste**	**Final residue and Rejects**	**Total waste generation**
12.85	**18.67**	**14.55**	**2.195**	**2.45**	**50.715**

25.34	**36.814**	**28.69**	**5.748**	**4.831**	**100%**

Source: Primary survey, 2022-23

Fig: 2: Waste ground in the city

b. Collection of wastes: The waste collection initiative extends beyond the outlined scheme, incorporating a systematic door-to-door collection process from residential premises. This comprehensive approach involves the deployment of additional handcarts, facilitating the efficient gathering of waste directly from households. Waste collection is conducted at diverse locations, including hotels, bars, designated residences, community halls, vegetable markets, residential colonies, and educational institutions. This strategy aims to enhance the inclusivity of waste management, ensuring a thorough and meticulous collection process throughout various segments of the community of krishnanagar**.**

c. Transportation of wastes: The gathered waste undergoes transportation to an open dumping ground located approximately 1.2 kilometers away from the central city. Various sections of the city contribute to the collection of waste materials, employing vehicles such as open trucks and some manually operated hand pullers. The waste is systematically loaded onto open trucks, which then transport it to the Godadanga waste disposal depot at the Chapra-Krishnanagar Bypass. Notably, the municipal solid waste (MSW) transportation operates under contractual arrangements, with contracts awarded for the daily sweeping and garbage collection duties in Krishnanagar. This crucial task is executed through a collaborative effort involving both contracted labor and municipal employees. This multifaceted approach ensures the efficient and responsible management of solid waste within the Krishnanagar municipality.

1. The total manpower bifurcated into the contractual labour and permanent labour categories into krishnanagar municipality:

- Driver: 8 contractual and 14 municipality employed
- Sweepers: 25 contractual and 78 municipality permanent employee

- Other Workers: 20 (on permanent basis) and 30 contractual basis.

2. Number of bins: Krishnanagar has nearly 25 bins in different place of the municipality, those are given by the State govt initiatives in the name of mission "Nirmal Bangla"
3. Equipment for waste collection: There are 5 tractor, 24 three-wheel van, 25 bin vat, 3 toto van collector have been deployed for the waste collection.
4. Waste management: For waste management there are one supervisor, and one sanitation supervisor actually controlling the whole system of waste collection.

d. Disposal of Waste:

Various categories of waste, sourced from residences, roadways, industries, and diverse sectors of Krishnanagar city, undergo transportation to an open ground specifically designated for indiscriminate disposal as well some bin system which is not adequate. Regrettably, open dumping persists as the exclusive method employed for waste disposal in Krishnanagar city, embodying one of the least sustainable and impoverished approaches to waste management. This method not only imposes severe environmental threats but also engenders air, water, and soil pollution, posing hazards to both human and animal life.

The consequences extend to diminished soil fertility and the transformation of previously fertile land into desolate expanses. The imperative for a more sophisticated waste management strategy becomes evident—one that places paramount importance on environmental health, public safety, and the preservation of critical ecosystems. The prevailing reliance on open dumping underscores the urgent necessity for contemplating alternative, environmentally friendly waste disposal methods to alleviate the adverse impacts on both the environment and the overall well-being of the community in Krishnanagar.

VII) Limitation and some suggestions to mitigate the problems:

a. Limitations:

- **Inadequate Financial Allocation:**

The yearly budget of Rs. 90 lakhs prove insufficient in tackling the intricate challenges associated with solid waste management in Krishnanagar. Sufficient financial resources are imperative for the implementation of comprehensive waste management strategies, encompassing infrastructure development, technology integration, and community awareness programs.

- **Land Scarcity and Unpleasant Odors:**

The limited availability of land (around 3 acres) designated for open dumping in Krishnanagar gives rise to unpleasant odors in the godadanga dumping ground, also affecting neighboring villages and regions. This not only raises environmental and health concerns but also underscores the urgency of identifying alternative and more expansive dumping sites.

- **Environmental Consequences of Open Dumping:**

The prevalent practice of open dumping contributes to soil degradation and pollution, negatively impacting soil fertility and leading to long-term environmental repercussions. The adoption of environmentally friendly waste disposal methods is imperative to mitigate these adverse effects.

- **Challenges in Waste Segregation:**

The absence of practices for segregating sewage at its source complicates the waste management process. Proper segregation is vital for efficient recycling and disposal. Initiatives involving public awareness

campaigns and infrastructure development are necessary to promote and facilitate waste segregation at the household level.

- **Shortcomings in Transportation Infrastructure:**

The deficiency in adequate transportation vehicles impedes the timely removal and disposal of solid waste. This shortfall results in the accumulation of waste in populated areas, contributing to health hazards and aesthetic issues. Strengthening the transportation infrastructure is pivotal for a more effective waste management system.

- **Overreliance on Open Dumping:**

The exclusive dependence on open dumping exerts significant pressure on existing disposal sites, rendering them unsustainable in the long run. The diversification of waste disposal methods, such as exploring recycling and waste-to-energy technologies, is essential to alleviate the burden on open dumping sites.

- **Implications of Population Growth on Future Waste Generation:**

The projected 25% increase in population every decade exacerbates the waste management challenge. Considering the current infrastructure and practices, existing disposal sites will prove inadequate to accommodate the escalating volume of waste. Long-term planning and substantial investment are necessary to address future waste generation.

- **Limitations in Organic Waste Utilization:**

While an organic chemical fertilizer company is in operation, its restricted daily output of 3 to 4 tonnes falls short in managing the substantial volume of organic waste generated. Enhancing and optimizing organic waste utilization methods, such as composting or biogas production, can contribute to a more sustainable waste management approach.

- **Environmental Impact of the Secondary Land Site:**

The choice of a secondary dumping site along the riverbank of Jalangi, locally known as Khore, is causing apprehension due to its environmental implications. This decision not only impacts the residents in the vicinity but also jeopardizes water quality, particularly during the monsoon season. It is imperative to evaluate and adopt environmentally friendly waste disposal alternatives for the secondary site, considering that this region was once a lush forested area, known locally as a popular recreation hub for the city during the evening. However, the introduction of open dumping has drastically altered the landscape, degrading the entire region with its unpleasant odor.

Addressing these prominent issues necessitates a comprehensive approach involving community participation, technological innovations, policy adjustments, and the adoption of sustainable practices. This will ensure the development of a more efficient and sustainable solid waste management system in Krishnanagar.

b. Suggestions:

- **Installation of Receptacles in Public Spaces:**

Implementing the provision of strategically placed waste bins in prominent public locations, including bus stands, railway stations, and squares, serves as a proactive measure to encourage responsible waste disposal among citizens.

- **Source Segregation for Effective Waste Management:**

Emphasizing the segregation of wet and dry waste at its source ensures a more efficient waste management process. This practice facilitates the proper treatment and disposal of different types of waste, contributing

to a cleaner and healthier environment.

- **Inappropriate Open Dumping for Biodegradable and Recyclable Waste:**

Recognizing that the majority of solid waste from Krishnanagar Municipality consists of biodegradable and recyclable materials, it is evident that open dumping is an unsuitable method for their disposal. Alternative methods need to be explored to address the specific nature of these waste components.

- **Adoption of Composting in Land Filling:**

Shifting from open dumping to a combination of landfilling and composting offers a more sustainable approach for managing biodegradable waste. This method not only reduces environmental impact but also enhances soil fertility through the integration of composted materials.

- **Specialized Recycling Techniques for Recyclable Waste:**

To address the disposal of recyclable waste, a dedicated recycling approach should be implemented. Establishing a recycling plant ensures that recyclable materials are systematically processed, minimizing their environmental footprint and promoting a circular economy.

- **Establishment of Recycling Plants to Replace Open Dumping:**

As an alternative to open dumping, the establishment of recycling plants provides a more sophisticated and environmentally friendly solution. The remaining land can then be utilized for landfilling, creating a more sustainable waste disposal infrastructure.

- **Innovation to Mitigate Pollution and Soil Fertility Concerns:**

Introducing innovative methods in lieu of open dumping not only mitigates pollution risks but also safeguards soil fertility. This shift in waste management practices reduces the potential for diseases stemming from improper solid waste disposal, fostering a healthier living environment.

- **Tailored Waste Management for Hospitality Sector:**

Recognizing the distinct waste generated by hotels and restaurants, a separate waste management provision should be established. This tailored approach ensures that the unique waste composition from these establishments is appropriately handled, promoting sustainability.

- **Recognition and Management of Biomedical Waste:**

Addressing the critical nature of biomedical waste, Krishnanagar Municipality should institute specific measures for its collection and disposal. Given its hazardous nature, a dedicated approach to managing biomedical waste is essential for both public health and environmental protection.

- **Innovative Waste Receptacles:**

Introduce artistically designed waste bins at key public locations, adorned in vibrant colors and creative patterns. This not only enhances the visual appeal but also encourages individuals to dispose of their waste responsibly.

- **Community-Led Cleanup Initiatives:**

Foster community engagement through periodic clean-up campaigns, cultivating a cleaner environment and instilling a shared responsibility for effective waste management.

- **Mobile Waste Collection Units:**

Implement mobile waste collection units with visually appealing graphics and informative messages. These units can move through various neighborhoods, making waste disposal more convenient and accessible for residents.

- **Youth-Led Awareness Campaigns:**

Harness the energy and creativity of local youth to conduct awareness campaigns. Utilize platforms such as social media, street art, and interactive workshops to educate the community about the importance of

proper waste management practices.

- **Waste Segregation Competitions:**

Organize friendly competitions among neighbourhoods or schools to encourage effective waste segregation. Include incentives or recognition for exemplary waste segregation practices, motivating residents to actively participate.

- **Eco-Friendly Events:**

Advocate for the organization of environmentally friendly events and festivals, prioritizing sustainable waste management practices. Incorporate recycling stations, composting areas, and the use of reusable materials to minimize the environmental impact of public gatherings.

- **Public Art Installations from Recycled Materials:**

Support local artists in creating public art installations crafted from recycled materials. These installations can serve as aesthetically pleasing landmarks while emphasizing the importance of waste reduction and recycling.

- **Revitalizing Spaces with Community Gardens:**

Transform areas previously impacted by improper waste disposal into green spaces and community gardens. This initiative not only rejuvenates the landscape but also promotes composting and sustainable practices within the local community.

- **Waste Management Education in Schools:**

Integrate waste management education into school curricula, educating students on the environmental impact of waste. Involve them in practical initiatives such as setting up composting bins and initiating recycling programs within school premises.

- **Incentivized Waste Reduction Challenges:**

Introduce challenges that incentivize waste reduction, such as providing rewards or discounts for households consistently minimizing their waste output. This approach fosters a shift towards more sustainable consumption habits.

- **Technology-Driven Solutions:**

Explore technological solutions like mobile apps to provide real-time information on waste collection schedules, disposal guidelines, and recycling centers. This empowers residents with accessible resources for responsible waste management.

- **Waste-to-Energy Initiatives:**

Investigate initiatives converting specific waste types into usable energy, addressing waste disposal concerns and contributing to the municipality's energy sustainability goals.

- **Collaboration with NGOs and Businesses:**

Form partnerships with non-governmental organizations (NGOs) and environmentally focused businesses, enhancing the effectiveness of waste management programs with additional resources and expertise.

- **Interactive Workshops for Businesses:**

Conduct workshops for local businesses on sustainable waste management practices, providing guidance on reducing single-use plastics, implementing effective recycling systems, and adopting eco-friendly packaging solutions.

- **Regular Waste Audits:**

Conduct routine waste audits to identify patterns and areas for improvement, using the findings to tailor waste management strategies and continuously optimize the municipality's approach to solid waste management

VIII. Conclusion:

The investigation into Solid Waste Management (SWM) in Krishnanagar City reveals an urgent need for a shift towards waste segregation at its source. This proactive approach is pivotal in addressing both the quantity and quality challenges associated with waste management. Unfortunately, the current SWM system in Krishnanagar does not fully acknowledge the significance of segregation. A thorough separation of waste types at the source holds the key to unlocking diverse disposal methods tailored to the specific treatment requirements of each waste category.

As Krishnanagar city undergoes rapid development and experiences a surge in population, the impending increase in solid waste production necessitates the implementation of composting methodologies. Establishing substantial composting plants is crucial for the proper treatment of the predominant biodegradable waste. Simultaneously, the establishment of dedicated recycling plants becomes imperative to effectively treat the substantial portion of recyclable waste within Krishnanagar's solid waste composition. This strategic initiative not only ensures proper treatment but also contributes significantly to pollution reduction.

Given the vast surroundings of Krishnanagar city, the adoption of sanitary landfilling emerges as a viable and environmentally conscientious waste disposal method. With judicious implementation, sanitary landfilling can prove to be one of the most effective means of waste disposal, considering the available space.

The transformation of the informal sector involving rag pickers and private collectors into an organized sector, now termed as "Swacchata apnar Duare" by the Krishnanagar Municipality, is a commendable move. This transition offers a dignified and organized platform for those previously engaged in hazardous and unhygienic waste collection activities, aligning with sanitation principles and improving the quality of life for involved individuals.

Recognizing the detrimental impact of open dumping on the environment and human health, it is imperative to replace such practices with environmentally friendly alternatives like landfilling and recycling. Embracing these contemporary methods not only minimizes harm but also positions Krishnagar city on a sustainable path for waste management. The incorporation of recycling, for instance, not only addresses the present waste load but also ensures a future-proof strategy for waste management, alleviating the burden on the municipality.

In conclusion, a concerted effort towards waste segregation, coupled with the adoption of advanced disposal methods and the organized inclusion of waste handlers, signifies a progressive trajectory for Krishnanagar's Solid Waste Management. These strategic measures not only enhance environmental sustainability but also lay the groundwork for a resilient and eco-friendly waste management system in the city.

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