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Revolutionizing the Facilities Sector: Innovations, Challenges, and Future Perspectives

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Abstract: The notion of environmental responsibility (ER) is introduced in the second section with reference to public assembly facilities (PAFs), which include theatres, sports arenas, and convention centres. Urban degradation, energy resources, and the effects of the built environment on society are the main topics of ER, a developing term in the social sciences. PAFs are crucial in the ER discussion, as they require significant investment for maintenance and upgrades to accommodate large gatherings. The section states that although community stakeholders and PAF managers view ER concerns as a high priority, little is known about the breadth of ER practices. Decision-making factors and the environmental impact of PAFs. Furthermore, there is a lack of comprehensive guidance for PAF managers in making ER-related decisions and developing policies in the built environment of PAFs. Two distinct subjects are highlighted in the passage. The difficulties Bangladesh is having managing the growing burden of non-communicable diseases (NCDs) as a result of fast changes in the population and in the epidemiology are covered in the first section. In Bangladesh, the percentage of deaths attributable to NCDs has increased, and it is important to improve primary healthcare services for NCD prevention and management. The study intends to examine the viewpoint of healthcare professionals on NCD services offered through PAFs. Furthermore, there is a lack of comprehensive guidance for PAF managers in making ER-related decisions and developing policies in the built environment of PAFs. Research in the facilities sector holds significant importance for several reasons: Improved Efficiency: Facilities play a crucial role in supporting various activities and operations, including businesses, public services, and infrastructure. Research in this sector can contribute to improving the efficiency of facilities by identifying optimal locations, designing effective layouts, and implementing sustainable practices. This leads to cost savings, resource optimization, and enhanced operational performance. User Experience and Satisfaction: Facilities directly impact the experiences and satisfaction of users, whether they are employees, customers, or the general public. Research in this field can provide insights into user needs, preferences, and behaviors, allowing for the design and management of facilities that meet or exceed user expectations. This, in turn, can enhance user satisfaction, productivity, and loyalty. Sustainability and Environmental Impact: Facilities have a significant environmental footprint in terms of energy consumption, waste generation, and resource utilization. Research in the facilities sector can contribute to sustainable facility management practices, such as energy-efficient designs, renewable energy integration, waste reduction, and green building certifications. These efforts help minimize the environmental impact of facilities and contribute to broader sustainability goals. In this Research we will be using GRA method. Facilities sector1, facilities sector2, facilities sector3, facilities sector4, facilities sector 5. Building management expenses, Cost of managing common assets Cost (mean) of HVAC system maintenance, cleaning the courtyard area (in the summer). facility sector 2 is having more data sets in all aspects. The utilization of multi objective programming techniques in facility location planning is valuable for addressing the impact of temporal shifts in demand. Unlike relying on artificial discount rates or unsatisfactory

planning strategies, this approach focuses on the quality of service over time. By providing insights into the consequences of decisions, this methodology supports well-informed decision making. The research aims to contribute to the discussion on environmentally responsible (ER) policies and practices in the context of Public Assembly Facilities (PAFs) and encourage their adoption among PAF managers. The goal is to promote sustainable practices and bring about a positive change in an industry that has traditionally lacked environmentally sustainable policies.

Key Words: *Delphi, improved nominal group methodology, MOORA, robustness, and multi-objective methodologies*

1. INTRODUCTION

The passage emphasizes the challenges faced by the Public Assembly Facilities (PAFs) industry in addressing environmental responsibility (ER) issues. It recognizes that there are substantial differences amongst PAFs in terms of size, structure, intended purpose, ownership patterns, and management structure, making it inappropriate to create a universal definition of ER. Due to the ambiguity and lack of direction, PAF managers are ill-prepared to face the mounting pressure to address ER issues in their facilities and communities. The reduction of public budgets for PAF support and the growing public demand for ER practices further exacerbate the long-term implications. The research discussed in the passage aims to bridge the gap between theoretical and applied studies in the PAF industry. It investigates how participation in these initiatives varies depending on the type of facility, location, ownership models, and administrative structures. It aims to identify the scope of ER practises in PAFs, such as adopting green initiatives, facility retrofitting, and establishing green task groups. The objective is to offer an econometric study of these projects as a starting point for upcoming debates amongst academics, decision-makers, funders, and PAF stakeholders. The literature already available in the PAF sector has demonstrated how broad green management practises can increase effectiveness and lessen environmental impact. However, there is a lack of understanding regarding which specific practices among PAF managers contribute to these outcomes and enable the industry to support ER holistically. Various factors, including internal pressures, organisational culture, financial considerations, competitiveness, and ethical issues, have been highlighted as drivers of ER support in earlier study. The importance of ER and green management has been underlined through initiatives like retrofitting and the creation of a green task group. Establishing a clear environmental philosophy, setting goals, conducting environmental audits, and implementing evaluation systems are also mentioned as crucial steps in the implementation of ER practices. Overall, the passage emphasizes the need for comprehensive research and practical approaches to address ER challenges in the diverse PAF industry, where sustainable practices are essential for mitigating environmental impacts and meeting stakeholder expectations. Teitz contends that only using static equilibrium analysis to analyse facilities and their systems ignores the crucial fact that they change over time. Due to this, there has been an upsurge in interest in modelling dynamic location problems, with the majority of the research concentrating on private sector locational decisions based on financial criteria such cost reduction and profit maximisation. The public sector, on the other hand, deals with a different set of dilemmas because utility metrics there are frequently non-financial and linked to social wellbeing. The lack of a clearly defined interest rate makes it difficult to calculate the present value of future social welfare. To effectively plan for the future, temporal shifts in the system need to be considered. One approach is to use planning strategies, as discussed by Scott. One strategy is a myopic approach that maximizes service based on current conditions and addresses future needs as they arise. However, this reactive planning may lead to suboptimal long-term outcomes. Another tactic entails planning the development of facilities to provide service in the interim while developing an ideal future system. This tactic's disadvantage is that it depends on future conditions projections, which creates uncertainty. The choice of the best strategy is dependent on a detailed analysis of the issue at hand. Different strategies indicate a variety of emphasis on current and future system performance. The article suggests a modelling framework that avoids choosing a planning strategy in advance and enables decision-makers to comprehend the trade-offs involved with each choice. This is accomplished using a multi-objective programming model that integrates goals for current and future service, offers a variety of planning methodologies, and openly demonstrates the advantages and disadvantages of each. Although the study particularly addresses the issue of situating emergency service facilities like ambulance bases or fire stations, the concept can be used in a variety of dynamic location scenarios. In public-sector location modelling, the average travel distance and the maximum journey distance are often used performance measurements. In emergency service systems, the maximum response time or distance is frequently desired because it represents the worst-case situation. The paper includes an illustration of a potential application in addition to discussing solution methodologies. The idea is to locate the fewest number of facilities to satisfy each point of demand within the standard, which is where the usage of distance or time criteria in facility location formulations comes from. In certain formulations, the number of facilities is intentionally insufficient to cover all points of demand, and instead, a specified number of facilities are located to ensure that the maximum population is served within the standard distance or time. The utilization of multiobjective programming techniques in facility location planning is valuable for addressing the impact of

temporal shifts in demand. Unlike relying on artificial discount rates or unsatisfactory planning strategies, this approach focuses on the quality of service over time. By providing insights into the consequences of decisions, this methodology supports well-informed decision making. The research aims to contribute to the discussion on environmentally responsible (ER) policies and practices in the context of Public Assembly Facilities (PAFs) and encourage their adoption among PAF managers. The goal is to promote sustainable practices and bring about a positive change in an industry that has traditionally lacked environmentally sustainable policies. The concept of robustness in econometrics has evolved from a quantitative to a more qualitative definition, using nominal scales to describe different levels of robustness. The meaning of robustness may vary depending on the context. In various studies, robustness is discussed in relation to policy regimes, financial contracting, and the analysis of non-communicable diseases (NCDs) such as hypertension. Globally, and especially in LMICs like South Africa (SA), the burden of NCDs, including hypertension, has been rising. Due to several health problems, such as HIV/AIDS, tuberculosis, injuries, and NCDs, SA's public healthcare system is facing difficulties. The population has a high prevalence of hypertension, which increases the risk of cardiovascular disease and is a major cause of death. Lack of resources, non-adherence to treatment, and ignorance of the condition are only a few of the causes of inadequate care of hypertension. Achieving universal health care in South Africa will depend on better hypertension control. Access to cheap, high-quality healthcare services and medications is being improved through programmes like the Central Chronic Medicines Dispensing and Distribution (CCMDD) programme and the National Health Insurance (NHI). Many hypertension patients in South Africa receiving chronic care at primary healthcare facilities continue to have uncontrolled blood pressure despite these attempts. This can be ascribed to elements like patient illiteracy and a lack of information about hypertension specifically. In conclusion, managing the difficulties of hypertension management and enhancing health outcomes are the relevance of robustness in this context. Improved disease control and the effectiveness of healthcare initiatives like the NHI and CCMDD depend on recognising the causes of uncontrolled hypertension and putting appropriate interventions in place.

2. MATERIALS AND METHOD

GRA METHOD: Tunnel ventilation is a critical aspect of tunnel construction and operation, particularly in long tunnels that use mechanical digging technology. Ventilation is necessary to create a safe and breathable environment, especially during critical situations such as accidents, fires, or ventilation system failure. Various methods of tunnel ventilation exist, including natural and mechanical systems such as longitudinal ventilation. The longitudinal ventilation system, which involves the flow of fresh air entering the tunnel and smog air exiting through limited openings, is commonly used in one-way traffic tunnels. Experimental models like wind tunnels were initially employed to analyze airflow, but computational fluid dynamics (CFD) software and simulation methods are now utilized to determine the optimal ventilation system, especially for pollutant dispersion analysis during events like fires. To evaluate different ventilation methods, researchers have used criteria such as visibility reduction and breathable air analysis. Economic estimates are also considered to justify the substantial investment costs associated with implementing ventilation systems. However, selecting the optimal method requires further research and analysis of specific elements. This study aims to identify significant criteria for mechanically ventilated tunnel pollutants and select the best option from available alternatives. The authors employ the Step-wise Weight Assessment Ratio Analysis (SWARA) to identify and evaluate effective criteria, and the VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) to assess and rank alternatives. This new methodology provides a framework for decision-making in complex scenarios. Additionally, the conventional Grey Relational Analysis (GRA) approaches are insufficient for interval-valued Pythagorean fuzzy information but are effective for MADM (Multiple Attribute Decision Making) problems with numerical information. The idea of interval-valued Pythagorean fuzzy MADM is used in this study to handle MADM issues with incomplete criteria weight information and correlated experts' weight information. The IVPFCIA operator is introduced, and its characteristics are examined to combine decision data and calculate the total preference value of each alternative based on the opinions of experts on the criteria. To determine attribute weights, multiple-objective optimisation models are created utilising the fundamentals of conventional GRA. We propose calculation procedures for handling interval-valued Pythagorean fuzzy MADM issues with missing data. To determine the ranking order of alternatives, the relative relational degree between each alternative and the positive-ideal solution and negative-ideal solution is determined. To support the suggested strategy, an example is provided. Overall, this study adds to our understanding of tunnel ventilation and offers decision-making frameworks for MADM problems with interval-valued fuzzy information and tunnel ventilation selection problems.

3. RESULTS AND DISCUSSION

TABLE 1. Facilities sector

	Cost of building management	Cost of common assets management	Hvac system maintenance cost (mean)	Courtyard territory cleaning (in summer)
facilities sector 1	0.064	0.11	0.18	0.31
facilities sector 2	0.06	0.14	0.37	0.12
facilities sector 3	0.057	0.11	0.18	0.15
facilities sector 4	0.058	0.12	0.09	0.15
facilities sector 5	0.058	0.1	0.18	0.2

This table 1 shows that facilities sector 1 is 0.31 ,facilities sector 2 is 0.12 ,facilities sector 3 is 0.15 ,facilities sector 4 is 0.15 and facilities sector 5 is 0.2.

TABLE 2. Normalized Data

	Cost of building management	Cost of common assets management	Hvac system maintenance cost (mean)	Courtyard territory cleaning (in summer)
facilities sector 1	1.0000	0.2500	0.6786	0.0000
facilities sector 2	0.4286	1.0000	0.0000	1.0000
facilities sector 3	0.0000	0.2500	0.6786	0.8421
facilities sector 4	0.1429	0.5000	1.0000	0.8421
facilities sector 5	0.1429	0.0000	0.6786	0.5789

This table 2 shows that the Normalized Data of facilities sector 1 is 0.0 , facilities sector 2 is 1.0,facilities sector 3 is 0.8421 ,facilities sector 4 is 0.8421 and facilities sector 5 is 0.5789.

TABLE 3.Deviation sequence

	Cost of building management	Cost of common assets management	Hvac system maintenance cost (mean)	Courtyard territory cleaning (in summer)
facilities sector 1	0.0000	0.7500	0.3214	1.0000
facilities sector 2	0.5714	0.0000	1.0000	0.0000
facilities sector 3	1.0000	0.7500	0.3214	0.1579
facilities sector 4	0.8571	0.5000	0.0000	0.1579
facilities sector 5	0.8571	1.0000	0.3214	0.4211

This table 3 shows that the Deviation sequence of facilities sector 1, facilities sector2,facilities sector 3, facilities sector 4,and facilities sector 5.

TABLE 4. Grey relation coefficient

	Cost of building management	Cost of common assets management	Hvac system maintenance cost (mean)	Courtyard territory cleaning (in summer)
facilities sector 1	1.0000	0.4000	0.6087	0.3333
facilities sector 2	0.4667	1.0000	0.3333	1.0000
facilities sector 3	0.3333	0.4000	0.6087	0.7600
facilities sector 4	0.3684	0.5000	1.0000	0.7600
facilities sector 5	0.3684	0.3333	0.6087	0.5429

This table 1 shows that the Grey relation coefficient facilities sector 1, facilities sector 2,facilities sector 3 ,facilities sector 4 and facilities sector 5.

4. CONCLUSION

The study's conclusions shed light on the difficulties faced by Bangladesh's various Universal Health Coverage (UHC) regions' Non-Communicable Disease (NCD) corners. The NCD corners are discovered to be underperforming, having problems with both the system and service delivery. These difficulties include a lack

of properly qualified human resources, inadequate tools and lab facilities, a shortage of supply of drugs and logistics, subpar documentation and reporting methods, coordination and communication problems, and a lack of appropriate standards and operating procedures. The study reveals that NCD corners' capability for NCD screening, investigation, treatment, referral, and follow-up needs to be improved in order to improve how well they work. A trained human resources team must be established, the physical infrastructure must be upgraded, basic equipment and logistics must be available, and communication and coordination between the NCD control unit of the Directorate General of Health Services (DGHS) and the respective UHCs must be improved. Additionally advised are long-term system strengthening and professional guidance. Before extending NCD corners to other UHCs, these findings should be taken into account. The services provided by Facilities Management (FM) at shopping malls are the subject of a different study. The study looks at the five-year link between general customer happiness and satisfaction with particular FM service aspects. The results show that average customer satisfaction scores are consistently rising, indicating that FM companies are successfully exceeding their clients' expectations. The study pinpoints the elements of FM services that influence shifts in total customer happiness and highlights crucial elements that have a big impact on overall satisfaction. These findings show that raising customer satisfaction levels in these vital areas can significantly raise it overall. The longitudinal study complements earlier research in the residential sector and offers insightful information about FM services in malls. The study has consequences for both theory and practise, highlighting the advantages and disadvantages of the Facilities Management Department's client services. Additionally, it helps create strategic strategies and techniques for enhancing customer service within the department and other organisations of a similar nature. The results also aid in comparing customer service in national and international situations.

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