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The Role of Urban Local Government in Promoting Green Building Practices at Municipality Level in Bangladesh

Farhadur Reza*

Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh

**Corresponding author: farhadrezaurp@juniv.edu*

Abstract: Rapid urbanization rate catalyzes the construction industry throughout the world. Construction industry consumes a significant scale of energy and emits greenhouse gases in the atmosphere and thereby causes climate crisis. In this circumstance, the concept of green building has emerged to ensure sustainable construction and tackle the climate change induced consequences. Through substantial literature review and thematic analysis, this paper attempts to explore the current green building practice, rating system, legal provisions, and governance aspects of green building practices at municipal level in Bangladesh. Findings reveal that a large number of industrial buildings are certified as green building in the industrial zones of mega cities. However, research and practice of green building is hardly found at the municipal level. Policy review indicates that limited green building features have been mentioned in the National Building Code and Environmental Policy and such features are rarely present in the Municipality Act. Besides, Bangladesh is currently following LEED rating system and yet to adopt its own rating system. There is a need for large scale infrastructural development in the municipalities to cope with accelerated urbanization. Hence, green building practice is critical to ensure sustainable urbanization throughout the country. Employing Key Informant Interviews, this study further identifies the major challenges of promoting green building practice and proposes some suggestions to overcome those challenges.

Keywords: *climate change, green building, sustainability, governance, policy implementation, municipal planning, Bangladesh*

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1. Introduction

Through man's over exploitation Global resources are being used up at an alarming rate. This triggers the reduction in fisheries, diminishing forest cover, depleting fresh water systems and natural resources and associated with climate change induced consequences (Li, Yang, He & Zhao, 2014). To a larger extent, the construction industry, has been responsible for environmental degradation (Zuo & Zhao, 2014). The construction industry consumes up to 40% of the total energy and accounts for up to 30% of the total annual greenhouse gas emissions at the global level (Chan et al., 2018, UNEP, 2009). Residential and commercial buildings account for nearly 40% of global energy consumption (Amaral et al.2020). Civil construction activities such as residential and non-residential buildings, factories, roads, bridges, drainage network, dams, and tunnels have significant anthropocentric environmental impact. Buildings are solely contributed 40 percent of the CO2 emission (Lassio, Franca, Santo & Haddad, 2016). Commercial and Residential buildings consume almost 40% of the primary energy in the United States or Europe, nearly 30% in China and approximately 32% in Bangladesh (Jamal et al. 2018, Deng et al. 2014). Since the devastating potentialities of climate change are being evidenced, the concern for the environmental sustainability is progressing simultaneously around the globe. Acknowledging that construction activity will always involve, to some extent, adverse environmental consequences, green building has been advocated and promoted as a guiding paradigm to development in the building sector (Hawan & Ng, 2013). It is the response to enacting sustainable development by the construction sector (Li, Chen, Chew, & Teo, 2014). One response to this concern is for local governments responsible to encourage environmentally sustainable building design through various initiatives and incentives.

Green building is the practice of creating structures and using processes that are responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, and renovation. During design and construction, green buildings use recycled materials, less water, less energy, and resource efficient techniques; incorporate water sensitive design and minimize vulnerability to flooding; minimize polluting emissions to water, air and

soil and minimize noise and light pollution, thereby minimizing adverse impact on the environment (Olubunmi, Xia, & Skitmore, 2016).Studies have shown that the greening technologies and design applied in Green Building can increase the efficiency of buildings by up to ten times in terms of resource utilization (Nguyen et al., 2017,). Compared to average conventional buildings, certified Green Buildings in Australia and New Zealand emit only one third greenhouse gases, consume one third electricity and half of potable water, and recycle almost 96% of demolition waste (Nguyen et al., 2017). Another study revealed that depending upon all the buildings becoming green, the global carbon footprint may reduce by 15–20% (Chowdhury, Sabrina, Zaman & Islam, 2022). This can contribute in the process of tackling climate change induced impacts. Consequently, this environmental-friendly construction process implicates socially and economically. Therefore, studying the role of urban local government in promoting green buildings at municipal level in a country like Bangladesh possessing resource scarcity and climate vulnerability is critical.

Bangladesh with its rapid population growth, carbon emission is an alarming issue (Fahim & Shahriar, 2024). There are 328 municipalities in the country aboding the ever-increasing population and creating demand for more infrastructures (LGED, 2025). Consequently, this is expected that construction activities will take place in an extensive scale and emit more greenhouse gases and thereby create climate crisis and environmental degradation at municipal level. Effective urban local governance and adequate civic services delivery is essential to face the challenges of rapid urbanization. However, absence of proper urban planning, inadequate financial management, and institutional weakness lead to the poor civic services delivered by the Municipalities in Bangladesh. Consequently, municipalities face a number of problems ranges from waste management, environmental degradation, unplanned construction led unhealthy and accident-prone environment within their jurisdictions (Chowdhury & Deb, 2012). Hence, the role of urban local government is crucial to address these problems. Very few research on green building has been conducted in Bangladesh so far. This study aims to identify the current practice of green building in Bangladesh, its governance aspects, legal provisions, rating system, major challenges for effective execution. Further this study makes an effort to find out the ways forward to overcome the challenges of promoting the green building practice in Bangladesh.

2. Materials and methods

Initially, an extensive literature review was conducted on the concept of green building, its practices, rating system at national and international context. In searching relevant literature major key words like green building, sustainable construction, green building rating system, building and climate change, and function of urban local government were used. Policy, code, and act were reviewed to find out the direction and provision regarding the green building practice in Bangladesh. Further, Key Informant Interviews (KII) were carried out among the town planners, engineers, Chief Executive officer at municipality level, building construction experts, and local government experts (Table 1) to identify the challenges in promoting green building practices at municipal level.

Table 1: Composition of Key Informants

Institution	Designation	Number
Savar Municipality	Town Planner, Chief Executive officer	1+1
Sirajganj Municipality	Town Planner, Engineer	1+1
Tangail Municipality	Town Planner, Engineer	1+1
Eco Home Solution	Building construction expert	1
National Institute of Local Government (NILG)	Local Government Expert	2

Source: Author 2025

Semi-structured interviews were conducted to gather qualitative data on the existing policies, challenges, and practices related to green building. Before conducting the interview, informed consent was obtained from the interviewees.

Collected data and information were analyzed thematically. For this study, data were analyzed under the themes such as building construction and climate change, green building, legal framework of green building, governance to administer green building at municipality level, challenges and prospects of implementing green building at urban local bodies. Based on the findings of the critical review of existing policy framework, comparative study on green building assessment framework on other countries, and key informant interviews, suggestions regarding the promotion of green building practice at urban local government level were proposed.

3. Results and Discussion

3.1. Green Building Practice in Bangladesh

Sustainable cities rely on a variety of municipal initiatives that aim to provide high quality infrastructure, effective public transportation management that ensure affordability and reliability, reduced noise and air pollution, access to public facilities and a clean and safe environment. Characteristics of Green Buildings take into account the location of their projects; not building on fragile landscapes or contributing to urban sprawl. They intend to minimize their environmental consequences by reducing surface water pollution and using retention ponds, xeriscape landscaping, and green space. The buildings themselves address exterior building concerns by integrating new technologies like window canopies, renewable energy, and green roofs while addressing interior problems by using minimum and recycled materials, sensor-based light and heating and improved interior air quality. By addressing the ways in which these concepts are adopted, municipalities can shape the form their cities and ensure sustainability (Boehm, 2010).

Though the concept of green building is new in Bangladesh, the country has achieved a mentionable milestone in this sector. The country becomes a distinct global leader in the number of green garment factories, boasting an impressive 209 establishments with LEED certificates. Among these, 79 hold platinum ratings, 116 are gold-rated, 10 have silver distinctions, and the remaining establishments are recognized for their green initiatives. SM Sourcing, the world's highest-rated green building, achieving an outstanding score of 106 out of 110 points, is situated in Bangladesh. This is an extraordinary achievement which reinforces the country's commitment to sustainable and environmentally conscious construction.

Bangladesh has also solidified its position as the frontrunner in LEED-certified garment factories. Total 54 of the top 100 and 18 of the top 20 green factories are located within its borders. This achievement resonates not only in Southeast Asia and South Asia but has also become a topic of frequent discussion in the Western world.

(a)

(b)

Figure 1: (a) Saiham Tower, Gulshan, Dhaka (Source: Saiham Tower, 2016) (b) Karupannya Rangpur Ltd. (Source: Context, 2020)

The country's dominance as the global champion in green garment factories has not only enhanced its image but has also attracted significant business from international clothing retailers and brands, diverting work orders away from other nations. Bangladesh's commitment to environmentally sustainable practices is not only admirable but also serves as an inspiration for others aspiring to make meaningful steps in the green building arena (South Asian Update, 2024). At municipal level, residential, institutional, and commercial buildings constitute a major segment of building footprint. However, installation of green features in residential, institutional, and commercial buildings are lagging far behind in Bangladesh.

3.2. Governance Perspective of Green Building Practice in Bangladesh

Most of the people in Bangladesh are not aware about the issues of green building since this is a new concept for them. However, different organizations of the country are carrying out their activities on this very important issue. The Housing and Building Research Institute (HBRI) of the government of Bangladesh, for instance, has been working innovatively to step forward with the sustainable building concept in the country. This organization can inspire the citizen to adopt innovative green building by providing both technology and strategic support and sustainable raw material solution for their clients. In other ways, the SGS Group of Bangladesh is engaged in promoting the green building concept in the country within its limited scope. The SGS' green building services include client dealings, especially with the assessment of basic building design, energy management, materials testing etc. However, besides this promotion of client services, few other

private organizations are implementing the concept through manufacturing their own environment-friendly products for constructing green buildings (Kumar, 2017).

In Bangladesh, there is currently no recognized green building rating system. LEED has been identified as the only rating system for formal certification recognized by Bangladesh Bank (Saba, 2019). LEED accreditation is growing popular for high-end commercial and textile industries since most builders and industrialists want to design "green" and energy-efficient structures. Karupannya Rangpur Ltd, shown in figure 1(c), is an addition to the thriving green building industry, which got LEED platinum certification in 2020 with 84 points (The Green Building Information Gateway, 2022). As the need for sustainable building construction has increased significantly in the present era, green building is becoming an important research topic in academia. Industrialized nations are attempting to become green building-based countries. As a developing nation, Bangladesh is raising awareness in green building, although implementation of green buildings is still limited. Furthermore, despite having numerous rules and regulations and guidelines included in the national policies of Bangladesh, it is rarely considered by the construction professionals (Khan & Shammi, 2022).

3.3. Legal Provisions in Promoting Green Building Practice

Rapid urbanization of nearly 3.1 percent urban growth resulted 40-50 percent deficits in urban services. The government, in response, initiated functional decentralization through establishing new municipalities. Over the years, the number of municipalities has been increased. Currently, there are 328 municipalities throughout the country (LGED, 2025). These municipalities require infrastructural development in greater extent to serve those increased populations. Since the demand for infrastructural facilities had increased, construction works also compounded accordingly (Hossain, 2013). To guide such large-scale construction works in sustainable manner, the municipalities need to play a key role. Therefore, sustainable construction policy and project need to be adopted by the municipalities to tackle environmental degradation and climate change crisis.

The Local Government (Municipality) Act, 2009 prescribed specific functions regarding the building construction in the municipal areas in Bangladesh (Table 2). The act chiefly focuses on the building approval process, ensuring the hygiene of the building, and action against the dangerous building. All these provisions aim to avoid building damage, ensure compatibility with surrounding land uses and occupants' safety. These provisions are hardly sufficient to promote green building practice at the municipal level. To cope with the challenges of rapid urbanization and climate change, the role of sustainable construction is evidenced around the globe. Therefore, key features of green building construction need to be addressed adequately in the municipal act.

Table 2: Legal provisions to promote green building

Policy/Code/ Act	Provisions
National Environment Policy, 2018	▪ Green building/energy efficient building should be implemented in the process of accommodation, housing and urbanization. ▪ Environmental sensitivity should be ensured. ▪ Construction of infrastructure should be adaptive with climate change.
Bangladesh National Building Code, 2020	▪ Sustainable construction practice is encouraged ▪ Design and drawing incorporating proposed sustainable features if building should be submitted during construction approval ▪ Green features like building insulation, opening, green roof, rain water harvesting, solar panel are prescribed
Local Government (Municipality) Act, 2009	▪ Take initiative to make the unhygienic buildings hygienic and healthy ▪ Provide building construction approval after checking design and drawings ▪ Demolishing dangerous buildings

Aiming to adapt the challenges of climate change and associated urban environmental consequences, the government of Bangladesh incorporated the green building issues in National Environment Policy, 2018 and Bangladesh National Building Code, 2020. The National Environment Policy 2018 argued for implementing green building or energy efficient building in the process of housing and urbanization. The policy further shed light on the climate change and environmental sensitivity in construction process. The Bangladesh National Building Code, 2020 suggested the inclusion of various green features in the process of building construction (Table 2).

The concept of green building is not currently incorporated in the building regulation section of the Local Government (Municipal) Act 2009. As a result, the municipalities are reluctant to promote green features in building construction. Besides, there is absence of institutional set up to adopt and promote green building practice throughout the country though green building issue is addressed in the National Environment Policy, 2018 and Bangladesh National Building Code 2020. Now, this is imperative to incorporate the green features into the Municipal Act keeping compliance with the provisions prescribed in the National Environmental Policy 2018 and Bangladesh National Building Code 2020.

3.4. Green Building Assessment Framework

The progressive concern in the building industry and management, along with the topics such as sustainability, building performance, environmental impact, energy, cost efficiency, and maintenance result the building rating system. The rating systems were a partial response to these issues, proposing quantifiable tools to evaluate and measure the level of a building's environmental performance. Several countries created their own standards of building performance, evaluation, and rating systems, addressing a wide range of environmental issues such as energy, design, construction, site, technologies, and materials (Attmann, O., 2010).

Most of the leading countries have their own green building councils to govern their green rating for building structures. For the time being, there is no real consensus on what is a green building and the architectural design community and the scientific and building research community are a long way apart. Therefore, it is an essential and timely need for Bangladesh to build such a rating system to assess the environmental acceptability of buildings. It is important to note that from country to country the considerations for those rating systems will change as the environmental conditions; level of development and the availability of resources vary from place to place (Tariq & Kushal, 2017).

Table 3: Green Building Rating Considerations recurrence.

Criteria	**Malaysia**		**India**		**Sri Lanka**	
	Consideration	Points	Consideration	Points	Consideration	Points
Energy Efficiency	√	35	-	-	-	-
Indoor Environmental Quality	√	21	√	15	√	13
Sustainable Site Planning & Management	√	16	√	28	√	25
Material & Resources	√	11	√	14	√	21
Water Efficiency	√	10	√	10	√	14
Innovation	√	7	√	6	√	4
Energy & atmosphere	-	-	√	37	√	21
Regional Priority	-	-	√	4	-	-
Management	-	-	-	-	√	4
Social & cultural awareness	-	-	-	-	√	3

Source: Adapted from Tariq & Kushal, 2017

Table 3 presents the green building rating considerations in Malaysia, India and Sri Lanka. It is observed that rating criteria and weight points are different for each country depending on the local context. Currently Bangladesh is following the US based LEED assessment system for rating purposes where some criteria are absent. However, other countries like Japan, even Sri Lanka adopted their own rating system to contextualize the native landscape, climate, and culture in the assessment process of green building practice and experienced fruitful results.

Besides, the weight points also need to be revised to address the local context. Therefore, Bangladesh needs to develop its own rating system incorporating socio-cultural issues, regional considerations. Moreover, weigh points need to be reassigned for specific criteria. For instance, more weight should be assigned on criteria such as sustainable site management, design approach, usage of indigenous material, indoor environmental quality, and atmospheric consideration. This is, therefore, an urgency to establish an institutional set up within the current organogram of the municipalities and incorporate green building features in the municipal act. Furthermore, education and awareness programs are needed in larger scale to make the people informed about the multi-level benefits of green buildings.

3.5. Challenges to Promote Green Building Practice

The practice and promotion of green building is facing several challenges since this is a new concept in Bangladesh. The challenges at municipal level were found relatively severe. The major challenges of promoting green building practice at municipal level are mentioned as follows.

- The concepts of green building are not currently incorporated in the building regulation section of the municipal act. Consequently, the citizen and the municipal officials are reluctant on green building issues.

- Personnel in the engineering section are not knowledgeable enough to promote green building practice at municipal level.
- Many Municipalities in Bangladesh are suffering from technical support and manpower shortage which obstruct the green building practice.
- Citizens at municipal level are not aware about the benefits of the green building. Moreover, lack of technical support from the municipal office makes them further discourage to adopt green building features.
- Lack of skilled professionals to trained up the municipal staffs to introduce green building.
- Absence of incentives to promote green building practice.

The above-mentioned challenges need to be addressed adequately foster the green urbanization process in Bangladesh. For that, priority-based actions should be taken at legal, institutional, and educational sphere.

4. Conclusion

This study analyzes the practice of green building in Bangladesh, its legal and institutional provision, and rating system. Findings show that the practice of green building is relatively new in Bangladesh. The government has recognized its importance and incorporated some directions in national environmental policy and the national building code as well. Initially, a number of factory and office buildings have been certified as green buildings by the LEED, a US based rating system. Still, a significant portion of the buildings in urban areas remain out of the green building domain. Municipalities in Bangladesh need to adopt green building strategies as large-scale construction take place here. Lack of precise policy directions, institutional set up, technical competence, education and awareness, however, hinder the green building practice at municipality level. Based on the above-mentioned findings following recommendations are put forward to promote green building practice at municipal level in Bangladesh.

Institutional reform

A separate standing committee should be formed entitled as "Green Building Committee" at the municipal level. Moreover, a green building expert should be attached in the engineering section to guide the sustainable construction of the assigned municipalities. The issues of green buildings should be incorporated and discussed at Town Level Coordination Committee (TLCC) and Ward Level Coordination Committee (WLCC).

Modernization of building regulation process

At municipal level, little flexibility has been observed in terms of building practice. New technology, materials, and design need to be incorporated into relevant building regulation process. Adoption of own context based green building rating system is critical for Bangladesh.

Giving awards or special recognition

Municipalities may give award or special recognition to the high-quality sustainable buildings. This is a small and low-cost initiative and will attract the private sector developers to construct green buildings.

Providing technical assistance

In promoting green building at municipal level, technical assistance is crucial. In accordance of municipal category, an Eco Design Advisor can be appointed to provide advices on sustainable building practices when building or renovating a home.

Education courses for Municipal staff

Education courses may be offered for the municipal staffs e.g. planner, engineer on sustainable design and construction.

Public education and workshops on sustainable design

Municipalities should arrange a series of public lectures and workshops regarding the Economics of Green Buildings in association with central government and university expert personnel.

Green collar Job Training Courses

The municipalities should organize training program to develop the skills on installing insulation, erecting solar cells, and waste recycling on construction sites. Such training will build expertise that is required to expand a workforce capable of constructing a sustainable built environment.

Self-Practice

The municipalities can make it compulsory to a certain level of sustainability for their own new buildings, and when retrofitting existing buildings.

Green Building Rebate Program

At municipality level, 'Green Building Rebate Program' should be introduced to encourage the citizens in adopting green feature during construction. The scale of rebate will be dependent on the building rating performances.

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