



20th ARCASIA FORUM, DHAKA

ARCASIA Committee on Green and Sustainable Architecture (ACGSA) Committee

Tuesday, 5 November, 2019, Venue: Army Golf Club, Dhaka, Bangladesh

The Bangladesh Report

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Introduction

Bangladesh is a country rapidly undergoing urbanization, with an extremely dense population. The building needs for this high density are consequently also very demanding, being mainly concentrated in the cities. Dhaka, the capital city, is now ranked as the most densely populated city in the World, with a density of over 47,000 persons/sqkm (Dhaka Tribune, 2018). The population growth and various push and pull factors, including those resulting from climate-change, have brought about this enormous density, and with it is the responsibility of providing built environments, which rests largely on Architects and designers of these spaces.

The power and energy sector present one of the success stories of the present government, which is moving towards attaining long term goals, for ensuring energy sustainability – aiming for 27,400 MW in 2030, and 51,000 MW in 2041 (PSMP, 2016). In terms of consumption, global figures show that buildings alone consume 47% of energy that is distributed (Figure 1). Of these buildings, 2017 figures show the building-wise consumption category in Bangladesh (Figure 2) – with residential buildings being the principal consumers, and industrial buildings following closely behind. Clearly, much of the responsibility of making these buildings more energy efficient is a paramount concern for green and sustainable architecture.

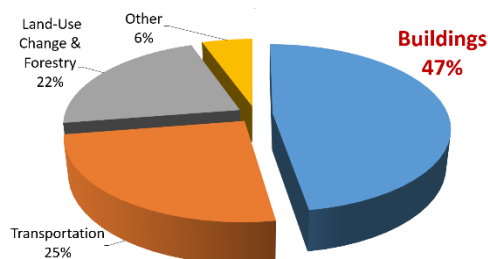


Figure 1: Bangladesh sector-wise energy consumption

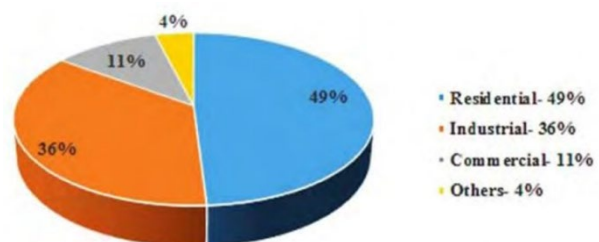


Figure 2: Building-type and consumption

Therefore Architects need to be engaged in creating sustainable environments and increase awareness regarding these key issues. Moreover, the contribution that Architects can make towards achieving the 17 UN SDGs cannot be underestimated, particularly for SDG 7 (affordable and clean energy) and SDG 11 (sustainable cities and communities). However, Architects are not the only stakeholders in designing the built environment, which also includes other professional design engineers, authorities, users, manufacturers of building materials and so on. This document discusses briefly the three pillars of action identified by ACGSA, and then focuses on Pillar 2: New Urban Agenda, which we in Bangladesh feel deserves particular attention in the present context.

The Three Common Pillars

The three common pillars identified in previous ACGSA meets are all vitally important areas that require to be addressed in architecture and design exercises.

Heritage and vernacular architecture deserve particular attention, standing as testimony to things that have worked consistently through the ages. There is much to be learnt from such examples, and we need to be able to preserve values that have served needs adequately in the past, while avoiding any mistakes that can be identified, in order to address the needs of future development.

Resilience is also a vital need for any built environment, which entails not only resilience towards disasters like floods, cyclones and earthquakes, but also resilience in terms of being able to withstand the forces of changing societies, life-styles and needs, which has a much broader scope, incorporating a philosophical base to the investigations, along with its technical detailing. These forces are in a constant state of change and designers need to be consistently aware of their impetus during the decision-making process.

At the same time, the present age has also brought with it new ways of tackling situations, new technologies, that have made life easier, and these need to be used, along with the old and time-tested solutions, to come up with **new urban agendas** – ultimately taking into account the immediate context, working with stakeholders, the climate, inclusivity, culture and so on.

Considering the Bangladesh situation, the need to standardize and ensure building quality, energy efficiency and sustainability, makes it important to finalise building codes and rating systems, which will guide the pressing demand for new development and planned urbanization. As any codes and Building Rating Systems will first and foremost affect the practice of Architecture, awareness on codes, engagement in their formulation and implementation methods needs immediate attention from the local Architecture community.

Present situation regarding Codes and Building Rating Systems in Bangladesh is given below.

The Bangladesh National Building Code

The Bangladesh National Building Code (BNBC) was first formulated in 1993, containing a set of rules that specify the standards for buildings to be built in Bangladesh. The present RAJUK rules are still based on that Code. The need to upgrade the Code was felt early in the 21st Century as building complexities, environmental consequences, health and safety issues, new building technologies made much of the old code outdated. Though the GoB has approved a revision, this has not yet been published, but is likely to be ready and adopted in the very near future.

The revised BNBC contains a new Chapter on Energy Efficiency and Sustainability, explaining the need for addressing green and sustainable architecture. The chapter (Figure 3) specifies directives for site sustainability, mentioning values for mandatory unpaved areas, site drainage coefficients, vegetation and irrigation plans and rainwater harvesting systems. It further stipulates on the building envelop,

mentioning acceptable window to wall ratios, opening and shading details, roof insulation and green roofing systems. The code also includes a section on energy efficient building systems, with codes for daylighting and supplementary lighting systems, lighting power density, occupancy sensors, ceiling and wall mounted fans, lift and escalator efficiencies, renewable energy options and HVAC systems. The chapter further includes codes for water management systems.

It may be mentioned here, that the process of write-up of this chapter was challenging, due to the lack of primary data for some of the issues addressed. In such cases, the authors needed to depend on data from similar situations in the neighbouring regions and beyond. The dire dearth of primary research was one of the very pressing concerns expressed by various experts during the formulation of this Code.

Also in addition to this endeavour of rewriting the national code, the GoB set up the Sustainable and Renewable Energy Development Authority (SREDA), which has been working towards various energy efficiency policies to promote green buildings in Bangladesh (Figure 4) since 2014. All these policies affect the practice of Architecture, and require Architects to be involved in their formulation, processing, modification and implementation.

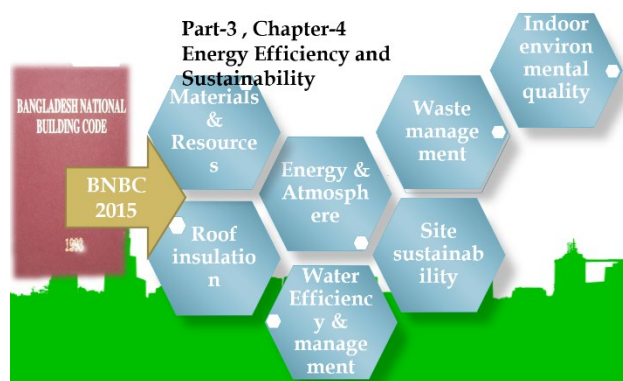


Figure 3: The BNBC and its components

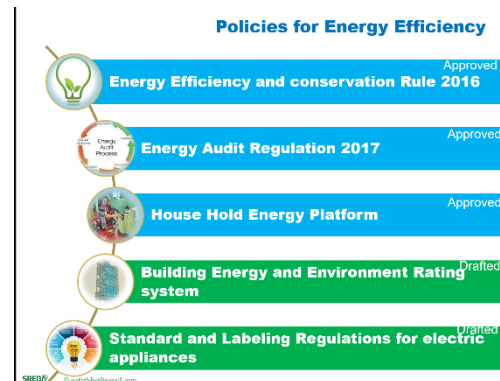


Figure 4: SREDA actions on Energy Efficiency

LEED in Bangladesh

The USGBC Building Rating System, LEED, awarded its first certification in Bangladesh in 2011, and has been working as a response to compliance needs, primarily for buildings in the Garments Industry of Bangladesh. The drive thus started as a business need and many clients approached architects to cater to LEED requirements. In the beginning the rating was done directly through US and foreign trained LEED APs, until some Bangladeshis began to gain the professional qualifications to serve as LEED AP. At present LEED certification is sought as a status symbol, and many commercial air-conditioned office buildings also vie for this certification, and green building is gaining popularity day by day. At present, seven of the highest ten LEED Certified (Platinum) buildings globally, are constructed in Bangladesh for garments factories.

While there are many positives and learning opportunities from the LEED system, the fact however remains that it is designed, primarily for the US, and serves its purpose as a tool for green architecture, best within that very context. Many of the points that form this rating are not relevant to Bangladesh, and the emphasis on natural conditioning within buildings could be addressed more comprehensively, given the context of the Bangladesh climate, compared to the focus on efficient conditioning equipment. In fact, most countries are adopting their own systems of rating buildings, for this very reason – to create a system that works for their own situations.

A Building Rating System for Bangladesh?

Building Rating Systems are optional codes that specify various issues within buildings to ensure maintenance of standards for performance, occupation and safety. They allow a building to be rated according to the system, in order to qualify for awards and benefits. To date, Bangladesh does not have an operational Building Rating System, formulated specifically for conditions faced in the country. SREDA is at present working on a rating system for Bangladesh – the Building Energy and Environment Rating (BEER) for Design and Construction of Buildings, V 1, R 2.

The system awards 150 points for various energy efficiency targets, most based on existing the international rating system LEED, the BNBC revised version and ASHRAE standards. However, in recognition that the needs, on the basis of which international rating systems were developed, significantly differ from country to country, it is important to have adequate primary research data to back the regulations and standards proposed in the system. While some points have been tailored to Bangladeshi conditions, the main thrust is towards energy efficient building systems more suited to air-conditioned buildings rather than the naturally conditioned building stock. This may encourage more Architects to go for air-conditioning, rather than the natural ventilation option, though the latter forms the overwhelming majority of the building stock in the country. This largely defeats the basic objectives of green architecture. Rather, a rating system should take into account the priorities and ways that architecture is practiced in a region, which can differ globally due to context, climate, economic and cultural needs.

The concern of Architects is geared towards reducing the demands of energy in the building stock, rather than in increasing dependence on sophisticated energy efficient equipment and technology. Passive architecture, thus, features strongly in design, and forms the basis of architecture practice and education. Following Building Rating Systems formulated in cold climates, or where affordability and availability of resources differs from Bangladesh, therefore, may imply non-sustainable solutions which are not appropriate for the context.

The immediate focus . . .

From the above discussions the Bangladesh Green and Sustainable Built Environment Committee of the IAB feel the immediate need to concentrate on the following specific points in any new urban agenda considerations, aiming towards the practice of green and sustainable architecture.

- Develop a contextual Building Rating Systems, involving the architecture profession, along with multi-level stake-holders, considering climatic, cultural, affordability and other contextual issues
- The Building Rating Systems must focus on creating standards focusing on naturally ventilated buildings, which form the bulk of the building stock in Bangladesh.
- For air-conditioned buildings, a separate Building Rating System may be developed, to control the high levels of energy consumption in such buildings
- Undertake research to generate context specific standards for incorporation in the Building Rating Systems
- To engage the Architects community towards green architecture, involving them at policy and other relevant levels so that their experience and expertise can be ensured

As mentioned in the introduction, the built environment is responsible for much of the present global ecological imbalance. We Architects, who are responsible for many of the decisions related to the built environment, need to act now, to avert environmental degradation and climate change, and to bring energy consumption down to acceptable levels.