SITUATION ANALYSIS AND FEASIBILITY REPORT

Operationalizing the Urban Resilience Unit of RAJUK

FINAL

URP/RAJUK/S-06

14 March 2019

Submitted by:

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Prepared for:

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3 February 2019

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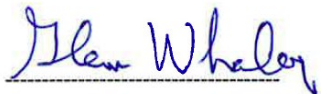
Subject: Submission of Situational and Feasibility Report for Contract No. URP/RAJUK/S-06; Credit No.: 55990 Consultancy Services for Operationalizing the URU in RAJUK.

Dear Mr. Abdul Latif Helaly,

With reference to subject titled contract dated 3 October 2018, RTI International, USA (Research Triangle Institute) is pleased to submit the Situational and Feasibility Report for the *Operationalizing the URU in RAJUK* project.

We appreciate your acceptance of this report.

Very truly yours,



Glenn Whaley
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Operationalizing the Urban Resilience Unit of RAJUK

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Executive Summary

In November 2018, RTI launched the inception phase of the S6 Operationalizing the Urban Resilience Unit in RAJUK project with the backing of RAJUK and the World Bank. The S6 project will provide institutional and technical support to the Urban Resilience Unit (URU) in its mission to improve seismic preparedness and resilience in the Dhaka Metropolitan Area. To successfully provide this support, a Situation Analysis and Feasibility Report about the current structures and activities being taken to improve resilience, the desired structures and activities to improve resilience, and the feasibility of achieving the desired state was required to ensure transparency across the project and its goals. This report presents the findings of RTI's situation analysis and feasibility investigation and presents options that align the objective of URU with sustainable institutional frameworks and resilience functions.

The activities that comprised the situation analysis and feasibility study and their key findings and recommendations include:

- **Investigating the current workings of RAJUK, coordinating government bodies, and non-governmental entities with respect to building resilience to the seismic-related disaster risks facing Dhaka.** RTI worked with RAJUK and relevant stakeholders to gather insight on the existing resilience frameworks established in Dhaka. The legal framework, roles, and responsibilities of all relevant RAJUK departments and external stakeholders were recorded.
- **Understanding of the vision and mandates envisioned for the URU**. The URU will lead RAJUK's effort to build demand for earthquake resilience in Dhaka. The URU will be developed as a multi-purpose team that facilitates organizational change and performance improvement across RAJUK to deliver an earthquake-resilient urban environment. The URU will operate as a research and development, training, and communications hub that will design, build, test, train, and transfer new systems and processes to the various operational and support wings of RAJUK. The URU will adopt a commitment to learning and continuous performance improvement, investing in its people to enable them to achieve their full professional potential. The URU will also utilize multi-channel communication strategies to raise awareness of the earthquake risk among key stakeholders, highlighting the economic, political, and social benefits of compliance with the Bangladesh National Building Code (BNBC).
- **Analyzing and comparing RAJUK's current situation with industry Disaster Risk Management (DRM) best practices.** RAJUK has the political will, technical assistance, a pool of young engineers ready for training, and resources to take the first steps of a resilience agenda that could be transformative for Dhaka City. Additionally, there are well-qualified training institutions in Bangladesh prepared to provide training to RAJUK staff and stakeholders. However, RAJUK generally and the URU specifically, currently lack some of the knowledge, skills, behavioral characteristics, and facilities to deliver the goal of an earthquake-resilient city. This project along with other concurrent urban resilience efforts present an opportunity to bring together professionals and other stakeholders to work together to mitigate disaster risk and strengthen urban resilience in Dhaka City.

- **Presenting reasonable and realistic institutional strengthening options.** These options will support fulfilling the URU's vision and mandates by building on the current institutional conditions. Two viable alternatives for the main function of the URU were identified that both serve to improve urban resilience elements in Dhaka:
    1. Development of the URU primarily as a research institution that influences policy and opinions on resiliency, creates tools and systems for use by other departments of RAJUK, provides training for RAJUK staff and others, and builds demand for resilient construction through public awareness; or
    2. Development of the URU as a scientific research and development AND a service delivery organization that implements the systems and approaches it develops rather than transferring them to other departments of RAJUK to operate.

  Additionally, five options were identified for the location of the URU, including within RAJUK, the ministry, and external to the government organization. This report presents the potential implications of each option, including benefits, drawbacks, cost, and time to implement. Recommendations for the URU organogram, long-term development plan, changes to the permitting and inspections system, and other elements are presented in Chapter 4.

In coordination with RAJUK, the options for the structure and function of RAJUK and their implications will be presented via focus group to RAJUK and relevant stakeholders to solicit feedback and provide further transparency for the transition process ahead. The results of the workshop will then be vetted by the Minister of Housing and Public Works. Following stakeholder input and buy-in, a recommended institutional framework will be developed that includes the social, economic, legal, functional, and capacity mandates needed to implement the URU vision.

1 Introduction

1.1 Background

RAJUK's Urban Resilience Unit (URU) was formed in 2017 to assist RAJUK in improving and expanding disaster-resilient practices, research, and implementation in Dhaka. The URU's current vision is to "increase Urban Resiliency in the Dhaka region by mainstreaming Disaster Risk Management (DRM) into its operations, functions, planning, policy and decision-making."

RTI has been contracted to support this initiative as part of the activities funded under the World Bank co-financed Urban Resilience Project (URP) and initiated this work in November 2018. Following inception, RTI has established contacts within RAJUK, other government agencies and ministries, independent organizations, and private businesses to author this Situation Analysis and Feasibility Report as the next step in providing support to the unit.

This Situation Analysis and Feasibility Report results from investigations that provide a better understanding of the as-is conditions, the stakeholder perceptions of the to-be scenarios, and the resources, timeframe and momentum needed to transition from as-is into the recommended to-be scenarios. A primary outcome of the investigation is to invoke a more complete picture of the vision and mandates that URU will aspire to achieve, namely:

- Function: What functions will the URU perform?
- Operation: What activities does the URU need to do to support the functions and fulfill the vision?
- Capacity: What knowledge, skills, abilities, and facilities must the URU have to meet the functions and vision?
- Social: What outreach and education offerings are needed, and with whom must URU communicate, to support the functions and vision?
- Structure: What structure will allow the URU to perform its functions and fulfill the vision?

1.2 Objectives

This report seeks to explore what is needed to support the successful establishment of the URU, both in the short- and long-term. The report explores how the URU will be organized, both from a structural and functional standpoint. In addition, the report analyzes existing capacities and resources within RAJUK to undertake urban resilience activities and attempts to project the capacities and resources needed by the URU in the future.

1.3 Methodologies

This analysis is based on a combination of desk review of existing documents, research into best practice organizations, gathering information from additional materials and in-depth interviews with key internal and external RAJUK stakeholders, and developing recommendations using a multidisciplinary team of experts. At each stage of investigation, the team reviewed initial findings and identified new areas of inquiry with the Project Implementation Unit (PIU). This created a dynamic and iterative process that allowed for deeper analysis of RAJUK's current state and readiness to launch the URU.

1.4 Limitations

The primary limitation in conducting this situation analysis was time. This analysis covers a wide array of topics and involved collecting and examining an extensive amount of data. RAJUK staff was exceptionally cooperative and generous with their time. Understandably, there is not yet a clear vision of the functionality and structure of the URU and it will be necessary to continue to engage decision makers, influencers, and stakeholders to arrive at the "best-fit" solution.

The URP-S04, URP-S05, and URP-S09 projects were also cooperative. However, they are early in their projects and have not yet fully explored what capacity the URU will need to proceed with activities once their projects are completed.

1.5 Report Structure

The remainder of this report describes the information gathered in the situational analysis and the resulting assessment. Chapter 2 summarizes the current state of urban resilience in Dhaka, stakeholders relevant to the URU, and the institutional framework of RAJUK. Chapter 3 presents a high-level summary of resilience institutions and their functions in other parts of the world. Lastly, Chapter 4 presents the feasibility assessment and resulting recommendations.

2 Situation Analysis of Current Status and DRM Practices

2.1 Urban Resiliency in Bangladesh

Dhaka is Bangladesh's capital and socioeconomic, cultural, and educational center. The city is densely populated (40,000 residents/km^2) and has experienced unprecedented growth in recent decades. Poor urban planning and enforcement of zonal regulations, excessive population density, and presence of a transient population of over 4 million have elevated Dhaka to one of the most vulnerable cities to disaster in the world.[1]

Dhaka's disaster risk potential has been acknowledged at the local, national, and international government levels as well as by non-governmental organizations through the development of regulatory infrastructure, committee formation and convention, guidance, disaster response and preparation exercises, standing orders, committees, departments, academic research, community engagement, and disaster evaluation projects. Figure 1 presents the national and local organization for disaster management.

The Ministry of Disaster Management has developed the Disaster Management Act, a National Disaster Management Plan, and the Standing Order on Disaster 2010[2] to help guide Bangladesh in the event of a disaster. The 2012 Disaster Management Act provides the structure to enforce rules, regulations, and standing orders, while the plan and standing orders are periodically assessed and updated by government agencies, technical practitioners such as engineers and planners, and representatives of many humanitarian agencies to better tailor response plans and orders to current situations.

The Ministry coordinates with the National Disaster Management Advisory Committee, Inter-Ministerial Coordination Committee, National Disaster Response Coordinating Group, Earthquake Preparedness and Awareness Committee, Japan International Cooperation Agency (JICA), and the United Nations Development Program Comprehensive Disaster Management Programme (CDMP) partnership to build resilience capacity. [3]

The Department of Disaster Management coordinates with the Focal Point Operation Coordination Group of Disaster Management, the NGO Coordination Committee on Disaster Management, the Disaster Management Training and Public Awareness Task Force, the Committee for Speedy Dissemination of Disaster Related Warning/Signals, and the National Platform for Disaster Risk Reduction. Furthermore, the Government of Bangladesh has committed to the Hyogo Framework,

[1] https://www.worldbank.org/en/country/bangladesh/brief/bangladesh-disaster-risk-climate-change-program
[2] Updated SOD is due to be published in 2019. It is currently awaiting NDMC approval.
[3] http://emi-megacities.org/wp-content/uploads/2015/01/Dhaka-City-EQ-Risk_ProfileandAtlas_FINAL.pdf

United Nations Office for Disaster Risk Reduction initiatives, and South Asian Association for Regional Cooperation Disaster Management participation.[4,5]

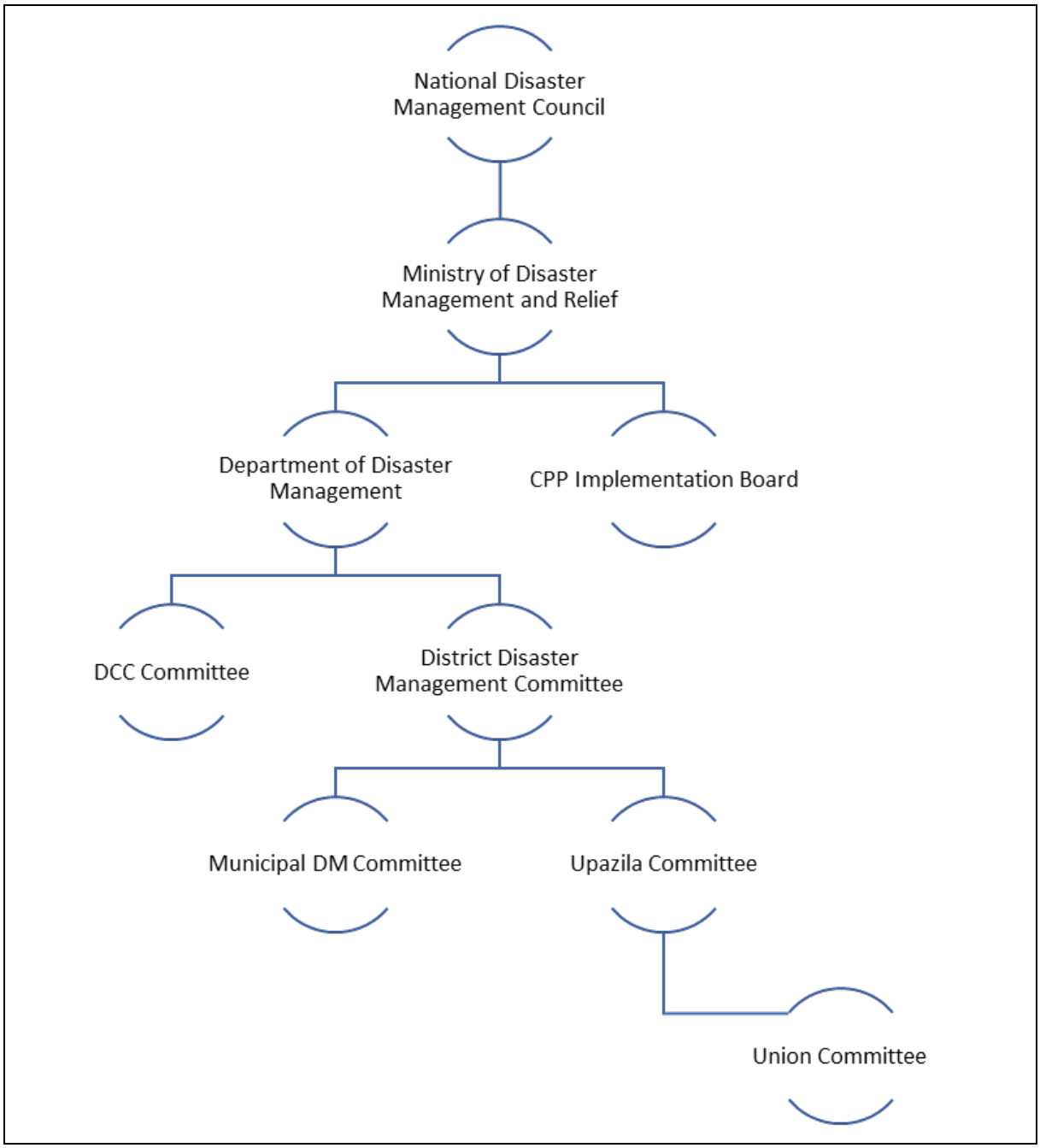


Figure 1. Local and national disaster management organization.

[4] Islam, R. and G. Walkerden (2017). "Social networks and challenges in government disaster policies: A case study from Bangladesh." International Journal of Disaster Risk Reduction 22: 325-334.
[5] https://info.undp.org/docs/pdc/Documents/BGD/CDMP%20APR%202014_Final_25Mar'15.pdf

As a result of the national, international, local, and regional attention to disaster management, several urban resilience activities have been implemented in Dhaka prior to the URP. Table 1 lists some of the previous and ongoing disaster management and resilience activities that have taken place in Dhaka in recent years.

Table 1. Excerpted Disaster Management and Resilience Activities in Dhaka.

Activity Type	Implementing Entity	Supporting Program
Disaster preparedness and response volunteer programs and training[6]	Dhaka North and South City Corporations (DSCC and DNCC)	CDMP
Training of construction professionals and PWD on earthquake resistant construction techniques[4,7]	CDMP, JICA	CDMP, JICA
Disaster and risk governance courses at local universities[5]	University of Dhaka	CDMP
Annual Disaster relief and response exercises[8]	Bangladesh Armed Forces Division, Ministry of Disaster Management and Relief, U.S. Pacific Command	Pacific Resilience Disaster Response Exercise and Exchange
Vulnerability/resilience/risk modeling and assessments[5,6,9]	DNCC, Oxfam, University of Dhaka	JICA, ADPC, CDMP, Department for International Development (DFID)
Earthquake contingency plans (2009, 2012)[6]	Department of Disaster Management, DSCC, DNCC	CDMP, Asian Disaster Preparedness Centre (ADPC), National Society for Earthquake Technology-Nepal (NSET)
Earthquake safety drills and outreach for primary and secondary schools as well as Upazila Education offices[5]	University of Dhaka, Ministry of Education	CDMP
Provision of Disaster Response Equipment and Command Centers[5]	Fire Service and Civil Defense	CDMP
Earthquake-resilient retrofit and relocation of private and public buildings (2011-ongoing) [10]	Public Works Department, Bank and Financial Institution Division	JICA

[6] http://pubs.iied.org/pdfs/G04287.pdf
[7] http://open_jicareport.jica.go.jp/pdf/12252391_01.pdf
[8] https://dod.defense.gov/News/Article/Article/1341975/disaster-relief-exercise-concludes-in-bangladesh/
[9] Kabir, M. H., et al. (2018). "Assessment of Urban Disaster Resilience in Dhaka North City Corporation (DNCC), Bangladesh." Procedia Engineering **212**: 1107-1114.
[10] https://www.jica.go.jp/bangladesh/english/activities/activity14_01_11.html

Enhancing gender responsive resiliency, disaster and climate risk informed planning, resilient infrastructure[11]	Ministry of Disaster Management and Relief (MoDMR), Ministry of Planning (MoP), Ministry of Women and Children Affairs (MoWCA) and the Local Government Division (LGD)	National Resilience Programme (NRP) (supported by UNDP, DFID, SIDA)
Other structural interventions[5]		CDMP

Despite the wide range of resilience activities being conducted in Dhaka, a recent urban disaster resilience study indicates that there are significant areas of improvement needed to support a holistic resilience picture.[9] The authors note that in Dhaka North City Corporation (DNCC) wards, building structure and institutional collaboration were noted as significant risks to urban resilience. Furthermore, low community participation and hazard awareness, and local budget for disaster preparedness were also noted. Dhaka South City Corporation (DSCC) wards were not studied.

2.2 URU Stakeholders

The organizational landscape in which RAJUK operates is complex and multifaceted. There is a constellation of local, national, and international organizations that share interests with RAJUK and the URU. An initial scan, key informant interviews, and RAJUK documents revealed a list of 60 stakeholders that currently share or have overlapping interests in DRM and construction permitting with RAJUK and the URU (see Annex A).

For the purposes of this report, these stakeholders are organized into five categories:

1. Internal (RAJUK URU)
2. External (Government, Utility, and Regulatory)
3. External (Industry)
4. External (Public)
5. External (International Partners and Donors)

Internal Stakeholders refers to all stakeholders internal to the RAJUK institutional structure. Internal stakeholders are those who are part of the structure and have a direct link and investment in the URU's mission, scope, and success. It is likely that the URU will provide significant and direct benefit to these groups and these groups will provide significant and direct contributions to the URU. These groups include the Ministry of Housing and Public Works (MoHPW) where RAJUK is housed and the departments relevant to the URU's mission and scope including the Development Control Department, Planning Department, Administration and Finance Department, Development Department, and Estates and Land Department. Internal stakeholders also include RAJUK and URU Members, key section leaders, and staff as they are at essential to realizing the URU's mission and vision. There are stakeholders within the 11 other organizations that fall under the MoHPW, including other urban development authorities, the House Building Research Institute, and the Public Works Department.

External – Government, Utility, and Regulatory Stakeholders refer to national and local government agencies, public utilities, and independent regulatory organizations and institutions that share some scope and interest with RAJUK and the URU. These interests may be limited to responsibilities for mitigating disaster risk that RAJUK shares with the Department of Disaster Management and the

[11] http://www.bd.undp.org/content/bangladesh/en/home/presscenter/pressreleases/2018/11/15/-12m-project-to-make-bangladesh-more-resilient-to-natural-disast.html

Ministry of Disaster Management and Relief or may include interests shared with local government agencies that have direct local construction permitting enforcement responsibilities (e.g., Dhaka Police Department – Traffic Division, TITAS Gas, Dhaka Electricity Supply Company [DESCO]). This group also includes organizations that serve regulatory and service functions such as Bangladesh Fire and Civil Defense (BDFCD). The Dhaka North and South City Corporations and their respective mayors are also important stakeholders and potential allies in building awareness of earthquake risk.

External – Industry Stakeholders include those industry groups that have direct interest in disaster risk management, structural engineering, and construction. This group includes key departments within public Bangladeshi universities like Bangladesh University of Engineering and Technology (BUET), the four other regional engineering and technical universities, and private universities such as the Ahsanullah University of Science and Technology. This group also includes professional associations of architects (IAB), engineers (IEB), and construction professionals (BACI). This category also includes more general groups of professionals in and around the building and construction industry like land developers and real estate agents including the Real Estate and Housing Association of Bangladesh (REHAB). The banking and insurance industries are also key stakeholders for the creation of demand for earthquake-resilient construction. Currently, neither banks nor insurance companies require structural information or evidence of BNBC compliance to issue loans or policies, but they could play a critical role in demanding compliance as they do in other countries.

External – Public Stakeholders include the general public in Dhaka City and those local, non-governmental organizations (NGOs, local and international) that represent public interests related to disaster risk management. Key organizations include the Bangladesh Disaster Preparedness Center (BDPC) and Building Resources Across Communities (BRAC). These organizations and Dhaka's citizens more generally will be key to the URU's outreach campaign and public education efforts. Bangladesh benefits from a diverse and vigorous media sector whose productions are widely consumed directly and through their social media arms. They are important partners for raising awareness and holding public and private institutions to account for the delivery of a more earthquake-resilient urban landscape.

External – International Donors and Partners include those key international organization that have made strategic investments in DRM in Bangladesh. These include direct investments in RAJUK and the URU, as well as DRM project investments more broadly. Key among these international organizations are the World Bank, Japanese International Cooperation Agency (JICA), UK Department for International Development (DFID), European Union, and Swedish International Development Agency (SIDA) among others. United Nations Development Program (UNDP)/Government of Bangladesh (GoB) projects including the New Partnership for Poverty Reduction (NuPPR) and National Resilience Programme may also complement some of the aims of the URP.

Looking ahead, understanding, engaging, and coordinating with the interests, aims, and activities of this large array of international, national, and local stakeholders that span private and public interests will be key to URU's success. Engaging relevant stakeholders to build synergies and gains in efficiencies while minimizing bureaucracy, duplication, and waste will serve RAJUK, the URU, and its stakeholders well as all work toward managing and mitigating disaster risk in Dhaka.

2.3 RAJUK Institutional Analysis

2.3.1 Operational Legal Framework

RAJUK is a regulatory authority under the Ministry of Housing and Public Works, which derives its authority from the Town Improvement Act.[12] This Act has as its purpose the development, improvement, and expansion of the Capital City.

The Act establishes that RAJUK will consist of a Chairman and not more than five other Members, all of whom are appointed by the Government "on such terms as it shall determine."[13] The Chairman and Members have the power to exercise "such functions as may be prescribed, or as may be assigned to them by the Government from time to time."[14]

The government has the authority to make rules necessary to carry out the Town Improvement Act. RAJUK can make regulations not inconsistent with the government's rules for carrying out the Act.[15]

As part of RAJUK's regulatory authority, it can appoint others "whose assistance or advice they may desire in carrying out any of the provisions of this Act." This person can participate in the meetings of the Chairman and Members but has no voting rights and is not a member of the decision body.[16]

RAJUK may engage officers, employees, experts, and consultants as needed to perform its functions. However, before any post is created, there must be a specific provision for it in the approved budget. Additionally, government approval is necessary to create a post that carries a salary above the approved government pay scale.[17]

2.3.2 Organization/Administration/Human Resources

RAJUK currently comprises five functional departments. The organization is responsible for two main functions in Dhaka:

- City planning and development control.
- Commercial development of government-owned land. In 2016–17, this commercial activity generated a financial surplus of 14,497,900,000 BDT (approximately $18 million USD).

2.3.3 Current Roles and Responsibilities of RAJUK Departments

Figure 2 presents the current RAJUK Organogram.

[12] The Town Improvement Act of 1953 has been amended from time to time since it was enacted, primarily to revise references to government organizations as the country gained independence. The Act originally created a Board of Trustees for the Dhaka Improvement Trust. This became Rajdhani Unnayan Kartripakkha or RAJUK.
[13] *Id.*, para. 4.
[14] Id.
[15] *Id.,* para. 152.
[16] *Id.*, para. 21.
[17] *Id.,* para. 34.

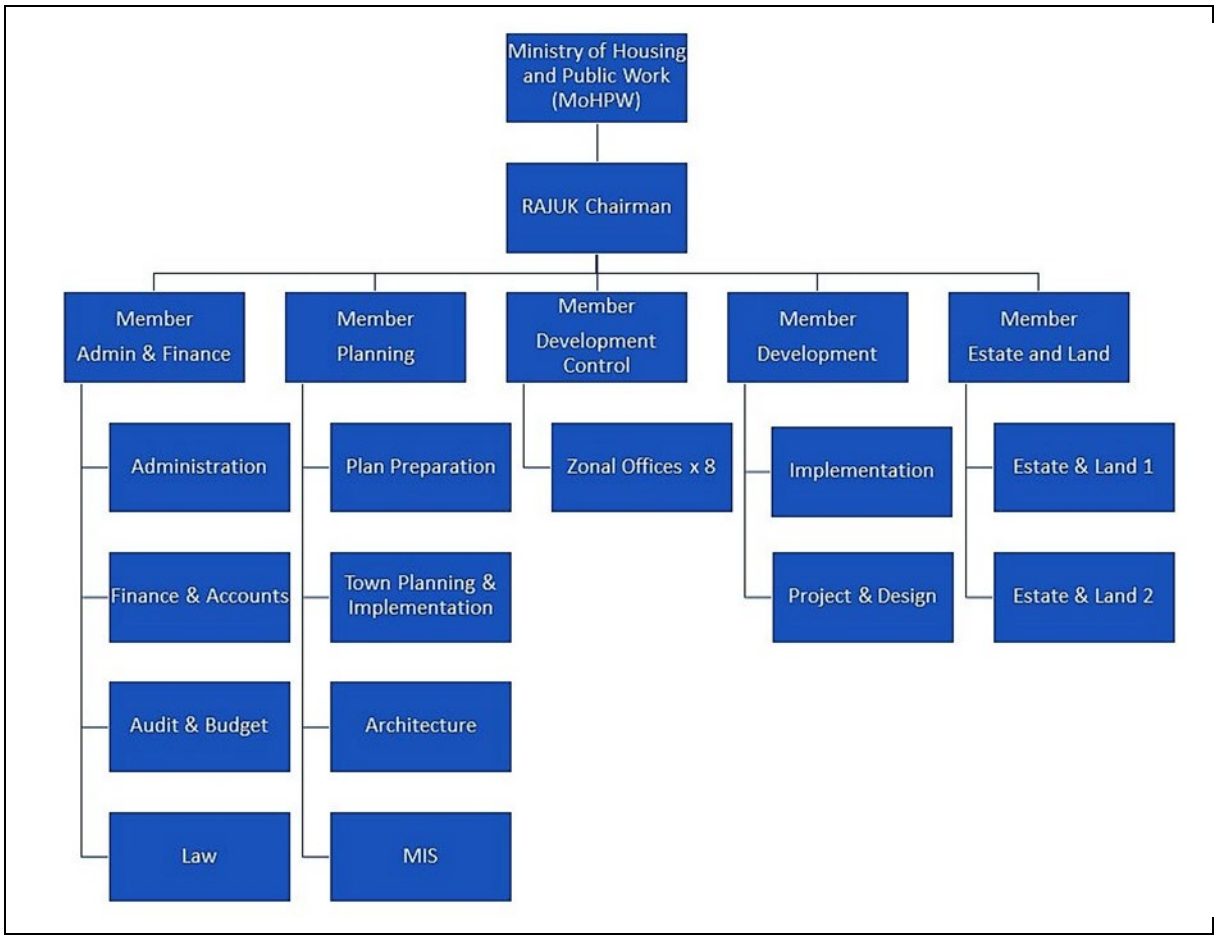


Figure 2. RAJUK Organogram

The RAJUK Annual Report 2016–2017[18] describes the roles and responsibilities of each department are described in the following section.

Administration and Finance

Administration and Finance comprises four departments, each headed by a director. The departments and their functions are:

- Administration – responsible for human resource management; arrangement of regular management and coordination meetings; management of regular training and the training calendar; salaries and benefits management; correspondence with internal (GoB) and national/international external organizations.
- Finance & Accounts – responsible for overall financial management including maintenance of the book of accounts and preparation of management accounts and statutory financial reports including balance sheet, income expenditure statements, and others.

[18] 2016–17 is the latest available annual report at the time of writing.
http://www.rajukdhaka.gov.bd/rajuk/page/template/annual_report/annual_report_16-17.pdf

- Audit & Budget – responsible for collaborating with the Government Audit Team (Public Works) for the audit of different RAJUK projects; collaboration with external audit firm for regular RAJUK financial audit; internal audit; and collaboration with the MoHPW Audit Team on their audit of RAJUK's internal audit team.
- Law – responsible for all litigation pertaining to RAJUK including issues of land acquisition, plot allocation, building plan approval or rejection, disputed issuance of land use clearance, and others.

Planning

The Planning Department has four sections headed by two Chief Town Planners, a Chief Architect, and a Senior System Analyst. The functions of this department are:

- Plan Preparation – responsible for preparation; review and update of strategic and detailed area plans for the Greater Dhaka City Region; identification of urban development problems; and training, seminars, and evaluation of solutions for urban development.
- Town Planning and Implementation– responsible for issuance of land use clearance and Non-Objection Certificate (NOC) documentation for public and private developments according to the Structure Plan and Detailed Area Plan; review and preparation of rules and laws for town planning; registration of private housing companies; protection of natural water bodies such as wetlands, canals and food zones; land acquisition planning for RAJUK developments; preparation of zonal plans; and legal action against infringement of planning rules and laws.
- Architecture– responsible for design of all RAJUK development projects and design of a wide variety of urban facilities.
- Management Information System (MIS)– responsible for the provision of more responsive electronic RAJUK services to the public; increase in the transparency of RAJUK systems and processes; network administration and support for RAJUK offices; implementation of RAJUK's e-government commitments; digital storage of RAJUK products including plans, maps and records; piloting of an in-house On-Line Construction Permit (OCP) service in Zones 3 and 4; and piloting of an in-house On-Line Land Use Clearance (LUC) service in Zones 4 and 5.

Development Control

The Development Control Department comprises two sections, led by Directors for Development Control (Zones 1 & 2), each coordinating four zonal offices, which manage a total 24 sub-zonal officers. The Development Control Department organogram has a total of 1,040 staff.

- Two Development Control Sections – responsible for policy making and coordination of the activities of four zonal offices each; regulation of building activities; review, revision, and enactment of relevant building control rules and regulations; approval of building construction plans; demolition or removal of unauthorized structures and deviated portions of constructions through mobile courts and eviction activities; registration of development companies; communication and coordination with other development agencies of the GoB.
- Eight Zonal offices, led by Zonal Directors – responsible for monitoring, coordination, and control of construction in three sub-zones. There currently are staffing shortages that affect permitting and resiliency: of 14 authorized officer positions, 4 are unfilled; of 48 assistant

authorized officer positions, 4 are unfilled; and of a planned 240 building inspectors, 105 are unfilled.

Development

The Development Department is responsible for the development of land and buildings. It comprises two sections led by the Chief Engineer (Implementation) and the Chief Engineer (Project & Design).

- Implementation – responsible for supervision of contractor and preparation of evaluation reports for procurement, operation, and maintenance; and provision of necessary infrastructure and utilities for RAJUK developments.
- Project & Design – responsible for preparation of project plans and detailed estimates for construction and development; tendering and processing contracts; and preparation of project profiles for approval by the government.

Estates and Land

The Estates and Land Department comprises two sections, each lead by a director. The department is responsible for managing completed RAJUK residential, commercial, and industrial developments; allocation of plots; completion, mutation, and transfer of leases; and land use clearance of completed development projects.

2.3.4 Current Staffing

The RAJUK organigram currently shows 1,980 employees in its official organization chart. It is evident that the organization is understaffed in most, if not all, departments. The most up-to-date RAJUK Human Resources (HR) list, shared in January 2019, lists 1,219 employees, a deficit of 761 persons. This is approximately 38% of the official staff size. Initial analysis suggests various reasons for this. In some cases, more than one position is held by a single person. In other cases, some vacancies are blocked pending court cases for different reasons. Over the past 10 years, there were 97 such HR-related court cases, of which 20 remain unresolved. RAJUK has also reported that some positions are difficult to recruit for, suggesting qualified candidates prefer to work elsewhere. A summary “as-is” RAJUK organization chart is included in Annex B.

The total staff complement does not include the newly appointed members of the URU Project Implementation Unit (PIU), which envisages a total of 82 staff, of which 55 are currently employed. The PIU has focused on the administrative aspects of the program to-date, although the cadre of young engineers, architects, and town planners have received technical training on remote sensing, GIS programming, earthquake resistant design and retrofitting of structures, geotechnical and earthquake field investigations, and laboratory testing. The trainings have lasted between 2 days and 2 weeks. The PIU teams are organized thematically around the various URP packages to be implemented by RAJUK, including vulnerability assessment, Risk Sensitive Land Use Planning (RSLUP), URU development, electronic construction permitting, and BNBC enforcement. Their main purpose is to support the contracted consultants to deliver their various objectives. The PIU organization chart is included at Annex C.

The GoB practices the regular rotation of senior officials (Deputy Secretary and above) of the Public Administration cadre (generalist policy and management experts). This rotation occurs approximately

every two to three years. The reinforcement or, if needed, the establishment of systems to ensure policy continuity around the development of the URU is recommended.

2.3.5 Current Human Resources and Operational Policies/Practices and Incentive Structures

RAJUK publishes an Annual Performance Agreement (APA) that sets out its goal, vision, mission, specific objectives, functions, and budget plan for the year. The APA is a mandatory commitment that enables the Prime Minister's Office to monitor progress of the whole government, through its Performance Management System for programs, towards the achievement of its Vision 2021.[19] This is Bangladesh's overarching strategic framework for development. It includes specific goals on infrastructure, housing, and the environment that are relevant to urban earthquake resilience. It will soon be superseded by Vision 2041. The APA provides only high-level indications of the organization's policy and practice goals in any given year. There is no evidence that it is "down-scaled" into departmental or individual performance plans within the organization.

RAJUK employs gazetted Service Rules, published in 2013, as the key policy document that governs its HR management practices. This document, available only in Bangla, updated the 2004 RAJUK Service Rules. Its 10 chapters cover the recruitment process; on-boarding, including establishment of individual position on the salary and benefits schedule; leave management; allowances for transport, official travel, and performance incentives; performance management processes through the service book and annual confidential report (ACR); basic code of conduct and description of disciplinary procedures; pensions and other benefits; and separation procedures. In an annex to the Service Rules, a list of recruitment criteria for the 107 different job types, from chairman to janitor, are outlined. Recruitment criteria do not yet reflect appropriate qualifications and experience for the new skills and knowledge that may be required to implement innovations planned under the URP such as the Electronic Construction Permit (ECP) system or Risk Sensitive Land Use Planning. These criteria will have to be updated as part of the first phase of the project.

There are reported differences between policy and practice in several areas. An example is the apparent absence of provision of transportation, or reimbursement of transport costs, to building inspectors and others undertaking site visits. This constraint has been highlighted in multiple discussions with RAJUK staff as an impediment to effective enforcement of construction controls. This is even though (1) motorbikes are supposed to be provided for building inspectors, but are not available in sufficient numbers, and (2) reimbursement for alternative transport (e.g., taxi) is not provided. However, provisions for transport allowances for official travel are included in the Service Rules. This matter, among others, is being investigated by the project team to determine if the reported situation results from a lack of resources, lack of application of existing rules, lack of awareness of existing rules, or another cause. The means to undertake a job are a critical component of capacity and a solution to this constraint is needed RAJUK to deliver its mission. It is also important to ensure that the offered means do not create a barrier for some employees (e.g., those who are physically unable to ride a motorbike).

[19] http://www.bangladesh.gov.bd/sites/default/files/files/bangladesh.gov.bd/page/6dca6a2a_9857_4656_bce6_139584b7f160/Perspective-Plan-of-Bangladesh.pdf

It must be noted that there are a plethora of rules and regulations originating in other parts of the GoB that have a bearing on RAJUK practices. There is often limited or no coherence between these rules, leading to cases of overlap or contradictory directions. This can lead to confusion and stasis.

The Service Rules are complemented, to an extent, by the RAJUK Citizen's Charter. This document outlines details of processes to be followed by citizens and staff to accomplish specific actions, the steps in the recruitment process, and the steps in the grievance redressal system, including appeals. The Citizen's Charter also includes contact details for the appropriate reference point for each function.

Salary and benefit schedules from the GoB scale, as of 2015, are clearly articulated for each type of job in RAJUK and in the GoB more broadly. A summary breakdown is attached in Annex D. It seems that at least some job types received a significant salary uplift recently. All grades benefitted from a revision to the GoB salary structure in 2015. Senior grades received a 95–97% raise; lower grades received raises of 100–101%. Since July 2018, RAJUK has adopted a GoB commitment for automatic annual increments of 3.75–5%. Despite this, all RAJUK staff we spoke to complained that salaries were too low relative to the cost of living. Pay includes a basic salary component, housing allowance, medical allowance, and transport allowance. The project team is investigating salary structures and recent adjustments across the organization to determine the extent to which basic salary adjustments may be a politically or financially viable option for incentivizing higher productivity in the future.

The Service Rules include provision for both financial and non-financial incentives to recognize and reward outstanding performance. These benefits are determined by a specially formulated committee. These arrangements are *ad hoc*, as are the criteria to determine what constitutes outstanding performance. Such incentives are actually used in practice. Financial and non-financial incentives can be useful tools to encourage greater productivity and morale. The URP believes such incentives may play a role in future performance management if transparently and routinely adopted.

2.3.6 Current Inter- and Intra-Office Engagement and Communication Mechanisms

Formal management coordination is conducted through regular monthly meetings, at different levels, throughout the organization. These meetings employ a structure of chair, member secretary, and members as mandated within the organizational rules. Established agenda and reporting formats are in place at each level, with proceedings and decisions recorded in official minutes that are subsequently distributed to an agreed audience. This process is replicated from engagements between the Secretary, MoHPW, and the RAJUK Chairman, down to the operations of zonal offices.

The formal means of communication for inter- and intra-office engagement and coordination are (1) official letters, (2) official/approved meeting minutes, and (3) subject-specific official case files.

Informal, spontaneous meetings are also employed within and between sections and departments, as needed to progress work of all kinds. There is a distinct preference for face-to-face or telephone interactions between individuals. E-mail is also widely used, although the official RAJUK e-mail system is rarely utilized, in preference for more reliable and user-friendly commercial systems such as Gmail, Hotmail, or Yahoo. This creates a challenge for the organization to collect and archive e-mail communications related to RAJUK business. It is common that senior officials tend not to use e-mail

communication for official purposes themselves. Instead, they may delegate that responsibility to assistants or more junior officers.

2.3.7 Current Staff Skills and Resources

A skills audit and training needs assessment are planned as part of the capacity development process. A literature review, focus group discussions, and key informant interviews undertaken in the RAJUK HQ, RAJUK Zonal Offices, and the URP PIU have revealed that, since 2013, a commitment to capacity development has begun to be implemented, organized by a new training cell within the Administrative and Finance Department. This primarily has benefitted staff recruited since 2013, leaving a significant (but unquantified) cohort of more experienced/long-serving staff in many job groups who have not benefitted from job-relevant training to the extent that more recent employees have. This is somewhat paradoxical within an organizational culture that values seniority (length of service) as a key criterion for advancement and benefit. It does, though, suggest that HR managers are engaging in helpful long-term and strategic thinking.

The 2013 gazetted Service Rules set out the qualification criteria for 107 job types. The project team is analyzing the extent to which these criteria match the job performance expectations and requisite skills, knowledge, and behavioral competences. There are clear associations between type of job and the entry-level positions that can be achieved. For example, building inspectors or chief inspectors in the Development Control Department must, since 2013, hold a diploma in engineering. An assistant authorizing officer or authorizing officer must hold a graduate degree in engineering or related subject like architecture. Criteria for employment in more senior positions are sometimes more flexible as the GoB makes quite extensive use of deputation from the Public Administration cadre of the civil service into positions that may, according to the Service Rules, require specific technical qualifications. For example, deputy secretaries may be installed as zone directors in the Development Control Department, or additional secretaries may be deputed as members running other parts of the RAJUK organization. While some may have a relevant technical or experience background, this is not universally the case. RAJUK estimates staff turnover to be quite high, especially in technical positions. This is reportedly a result of limited opportunities for career advancement and better paid opportunities in the private sector, among others. Some RAJUK employees also cited the pressures of a hostile working environment with limited encouragement and support.

There currently are two main training opportunities for RAJUK staff that have been identified. The first is an in-house administrative training course lasting for 15 days. Training facilities are makeshift. There is typically one batch of new and existing staff trained per month. It covers subjects including the RAJUK Service Rules and some job-related areas of knowledge like opening and managing case files correctly. Instruction is classroom- and lecture-based with no experiential elements. The training is assessed through a test that, it is anecdotally reported, everyone passes. There are no clear consequences or remedial actions envisaged for anyone who fails. The second training is a 35-day residential foundation course for new employees along with some existing staff. This training has been delivered by the BIAM Foundation (Bangladesh Institute of Administration and Management). It covers a broad curriculum including the legal frameworks relevant to RAJUK, manners (behavior), and some technical aspects of the construction inspection and permitting system. Instruction is classroom- and lecture-based with no experiential elements. The training is assessed through a test. The pass rate is not known nor are the consequences of failing, if any. This is not yet a routine training opportunity and is dependent on

budget. The cost to date is estimated by RAJUK at approximately 100,000 BDT per participant. There are limited plans for associated follow up or refresher training.

There is a clear opportunity in the first phase of the URP to build on these two established training packages and a strong demand among staff for further training in a range of areas to address skills, knowledge, and behavioral gaps or upgrade needs. This will involve redesigning the training packages in alignment with new systems such as the ECP, to offer applied skills development through hands-on learning, and to enhance the earthquake resilience focus through, for example, an introduction to structural engineering. Further training under the URP must also consider the need for new skills and knowledge development that do not currently exist in RAJUK or the URU, but that are critical for their success in delivering a resilience outcome. These include, but are not limited to training, communication and public education, performance management, and research. In addition to substantive initial training packages, the project must also consider how new training can be aligned with the GoB's commitment to providing 60 hours, minimum, training for all staff per annum.

New staff joining the Development Control Department are attached to a more experienced staff member who acts as a coach for on-the-job training. This lasts for a minimum of two months before the new staff member is able to operate independently. There is no process to guide the coaches and no training for them in coaching skills. There are also no criteria to objectively determine when a new staff member is ready to operate independently. This decision is left to the judgement of the coach. There is no requirement for the coach to document his or her reflections on the new staff member's progress or potential unless he or she is the individual's supervisor. There is no indication that coaching is used to identify training needs. This process can be developed and used far more effectively in the future.

Some RAJUK staff have provided feedback that they lack the means to undertake their jobs properly. This concerns material requirements such as transportation or a desk at which to work. It also applies to the inconsistent application of established policy. A clear example relates to the decision to decentralize authority and functions from the HQ to the zonal offices to bring service delivery closer to the client and to improve efficiency. Zonal directors related that, on paper, they are supposed to be managing locally deployed planning staff, for example, but that these officers have not yet relocated from the HQ. In another example, it was noted that zonal directors have no authority to coordinate with their local counterparts in, for example, the police. Communicating requests for assistance therefore takes a long time. Further, zonal directors are allocated only 5,000 BDT a month for petty cash, limiting their capacity to innovate in, for example, greater engagement with local stakeholders. Greater zonal control over operational budgets would, it was claimed, unlock local innovation and improve performance. The specific combination of reasons for this lack of compliance with the decentralization policy internally and other restrictive procedures and practices are being investigated to understand how best to achieve change. It is difficult to hold a zonal director to account for his or her performance, or that of their teams, if they lack the authority, human and financial resources, and procedural and other means to get the job done.

Current career development pathways in RAJUK are linked to seniority, initial qualification, and length of service to a much greater extent than performance, attitude, and potential. For example, an assistant authorizing officer of the Development Control Department must be in that post for seven years before being eligible for promotion. In principle, authorizing officers have no career path upwards. This acts as a disincentive to outstanding performance and makes recruitment from within

the cadre of assistant authorizing officers less desirable. This in turn requires more extensive use of shorter-term deputation from other departments or services with consequent impact on skills and knowledge matching with the requirements of the position.

There are no continuing professional development (CPD) opportunities or requirements in RAJUK. Linking CPD thresholds to specific jobs would most likely encourage participation and performance improvements in pursuit of promotions and career development at all levels. Finally, GoB HR systems do not consider additional qualifications gained since entry into an institution; for example, if an employee gains degree while employed. This may contribute to excessive turnover.

2.3.8 Existing Equipment, Including Computers, Hardware and Software

This situation analysis phase included a visit to the Management Information Systems (MIS) department of RAJUK. MIS is responsible for information and communication technology (ICT) service to RAJUK headquarters and zonal offices. It is staffed as follows:

- 1 manager
- 1 senior system analyst
- 1 system analyst
- 2 programmers
- 3 computer operators
- 1 data entry operator
- 4 administrative support staff

The RAJUK MIS department also operates its own data center on premises, hosting various databases and applications. During the initial visit to the RAJUK MIS department and zonal offices, RAJUK ICT managers demonstrated the following applications:

- Land plot database — allows GIS-based visualization
- Online construction permitting application — developed by a local firm named TechnoHaven, currently piloted for RAJUK zones #4 and #5, but lacking integration with 11 NOC agencies.

A comprehensive ICT assessment will be conducted as part of the next phase of the URP-S07 project and its results will be presented in the URP-S07 Construction Permitting (CP) Assessment Report.

Due to a general lack of adequate computerization, information processing largely relies on paper-based workflows. Observations of actual workflows performed during the Inception Phase showed that information is handled in a thorough and meticulous manner. However, the paper-based nature of workflows causes unavoidable constraints in terms of storage and sharing or formatting of information. This results in unavoidable bottlenecks that limit operational efficiency. There are few promising examples of adequate ICT support, such as the existing land plot database. Another consequence of the lack of adequate computerization is inconsistency in information processing. Regardless of how thoroughly and meticulously information is handled, consistency and transparency remain inherently at risk.

2.3.9 Existing Data Security and Management Strategy

As already stated, a comprehensive ICT assessment will be conducted as part of the next phase of the URP-S07 project.

Early findings from this analysis revealed practices potentially putting data security at risk. One example is the absence of an electronic directory identifying all authorized ICT users and related permissions. Another example is the existence of a corporate domain name that potentially allows all authorized users to be provided with a corporate e-mail address. It appears that only a minority of RAJUK managers and officers actually use their corporate e-mail account, implying that most RAJUK managers and officers use personal and unsecured e-mail accounts. A third example is the compliance of RAJUK's own data center with regards to international standards, which was reported to be only partial.

The development of an ICT plan or strategy is suggested as an organizational priority.

2.3.10 Current Performance Monitoring Plan and Activities

RAJUK employs the GoB's standard approach to performance management as mentioned in Chapter 6 of the gazetted 2013 Service Rules. The employee maintains a Service Book detailing his or her activities. The supervisor may choose to review this, or may not, prior to completion of the ACR. This performance review is conducted without the participation of the staff member being appraised. The process does not reflect good practice in a variety of ways, including lack of (1) participation and ownership of performance goals by the employee, (2) a transparent link to incentives or disciplinary actions that may be used, (3) connection between individual performance plans and overall organizational goals and priorities. In addition, this creates incentives for staff members to focus on "keeping their boss happy" rather than focusing on the official priorities and practices of one's job. While it is unrealistic for this project to reform or replace the GoB's performance management process, it may be possible to encourage the adoption of new cultural practices around employee participation in performance goal setting among other good practices. RAJUK's HR team has indicated that the GoB is planning to introduce a new performance management system to replace the ACR at some point in the future.

2.3.11 RAJUK's Current Internal Capacity to Vet and Validate the Accuracy and Applicability of Contributions, Criticism, and Recommendations from Internal and External Stakeholders

Developers' associations and professional bodies complain that RAJUK does not listen to or act upon the feedback that they are given. It is currently unclear what formal processes there are for soliciting, analyzing, acting upon, and communicating the consequences of feedback received. The existence of the RAJUK board, that includes a representative of the private sector, does not appear to significantly impact operational decisions and priorities. The APA requires RAJUK to conduct stakeholder engagement. Such engagements, bringing the Chairman and senior staff to meet stakeholders at zonal meetings, have happened, but the results of such meetings are not clear.

There is an established Grievance Redressal Mechanism with contact and process details available through the RAJUK website. RAJUK staff suggested that they maintain no relational database of grievances or their resolution, so could not provide data on the effectiveness of this mechanism.

2.3.12 SWOT Analysis Related to Individual/Institutional Capacity

Strengths

- RAJUK now has the political will, staff readiness, technical assistance, and resources to take the first steps of a resilience agenda that could be transformative.
- There are well-qualified training institutions in Bangladesh, including BUET and other technical universities, and others including the Engineering Staff College of Bangladesh, owned by the Institute of Engineers, Bangladesh, to provide training to RAJUK staff and stakeholders.
- RAJUK has a pool of young and qualified engineers who can contribute to the resiliency goal and who may be considered for succession planning through a skills development program.

Weaknesses

- Too few engineers are trained in earthquake resiliency design and the permitting system and market perceptions do not demand these qualifications.
- The general perception among RAJUK employees is that they do not have the skills and knowledge to deliver on the resiliency and regulatory goals of the organization.
- Structural engineering is not included in the building construction permitting process and structural engineering checks are not included in on-site monitoring visits.
- RAJUK does not have a succession plan. A significant number of senior level employees are due to retire by 2020 and this could create a vacuum in the operations.

Opportunities

- There is donor interest in supporting Bangladesh and Dhaka specifically to address the hazards they face. If well-managed, these opportunities can reinforce each other.
- The URU can help lift the performance of the entire RAJUK organization by adding important new functional capability toward the goal of a more resilient Dhaka, such as through the testing and research laboratory, communications and training, public education.
- There now seems to be political will to strengthen RAJUK's regulatory functions.
- RAJUK staff have indicated a willingness to undergo reforms and improve operations and technical capabilities.
- The ACCORD and ALLIANCE experience in making improvements in factory safety, including structural safety, since RANA Plaza, may offer useful insights and knowledge from which to learn.

Threats

- The training package needs to be aligned well with the resiliency goals and evolving work practices and systems. If it is not harmonized in this way, it will not be impactful and staff will remain lacking in skills necessary to do their jobs.
- There is not a clearly articulated pathway for career development, contributing to demotivation and excessive turnover, especially among technical staff.

- The request for an expedited implementation period may decrease the likelihood that the impacts of the project are sustainable, as deliverables can be provided but there may not be sufficient time for implementation activities.
- Retirement of senior level and critical positions in RAJUK, which are due by 2020, may create a significant vacuum in operations.

2.4 Functions and Operations of RAJUK Related to DRM

This section outlines the status of functions and operations currently in place within RAJUK as they relate to the city's ability to manage disaster risk. In Dhaka, approximately 98% of the building inventory falls under the jurisdiction of RAJUK (includes all public buildings such as ministry administrative buildings, schools and hospitals, but excludes military and paramilitary facilities). Land is classified into three types: (1) land belonging to RAJUK (located in RAJUK Project Areas); (2) land belonging to the National Housing Authority (NHA) and other ministries; and (3) land that is privately owned. Apart from infrastructure developed for military purposes, all new building construction projects carried out on any of the three types of land require approval from RAJUK. In other words, RAJUK's planning and regulatory functions can ensure more disaster-resilient construction. This is subject to the extent to which disaster risk is integrated into RAJUK's functions, including better land use planning and building code enforcement through permitting and monitoring of constructions.

2.4.1 Land Use Planning

RAJUK's mission is planning, development and development control, and managing the growth of Dhaka, with a vision to be an apex planning authority to build a healthy and livable capital city. While the City Region Development Project (CRDP) initiated by the Asian Development Bank (ADB) has led to the development of a new strategic plan for Dhaka for the period 2016–2025, the new Dhaka Metropolitan Development Plan (DMDP) with its Structure Plan (DSP, 2016–2035) has not yet been adopted. To complete this process, RAJUK is currently formalizing its Detailed Area Plans (DAPs, 2016–2035) using a community-based planning approach. In the interim, the DMDP 1995–2015 (developed in 1995) is still used for city planning. This plan encompasses an area of 1,529 square kilometers and includes (1) Dhaka Structure Plan (1995–2015), (2) Urban Area Plan (1995–2009), and (3) DAP 2010–2015. Hence, over the last three years, outdated planning requirements have guided Dhaka's development.

The upside is that resilience is described as one of five key objectives of the city's planning approach for 2016–2025, which the proposed URU can then support. A "Resilient City" is described as one with a resilient built environment, social structure, and economic/employment structure. The new proposed land use zones in the DAPs for 2016–2035 have provisions to incorporate spatial planning zones accounting for disaster risks, such as flood flow zones.

RAJUK is now being supported by URP-S05, aimed at fostering the development of a comprehensive approach to managing earthquake risks through activities including (1) strengthening the current planning regulations, processes, and methods of RAJUK to ensure that the DSP and DAPs 2016–2025 are risk sensitive; and (2) a systematic process of knowledge transfer whereby government planners and private professionals are trained on risk-sensitive land use planning. A part of this project

component is the compilation and creation of data that will provide RAJUK with a better understanding of the city's vulnerability to earthquake risk.

2.4.2 Land Use Clearance

RAJUK's Town Planning and Implementation Section is responsible for issuing land use clearance to both private and public entities. Any entity with property within RAJUK's area of administrative control and outside of an area covered by a spatial plan is required to apply for land use clearance as a first step to obtaining government permission for its development activities. This allows RAJUK to ensure zoning and other planning requirements are met.

Form 101 is the general application form to obtain land use clearance. RAJUK must act on this application within 30 days. It can approve the application, imposing any necessary conditions (Form 102), or it can deny the request (Form 103). Once approved, there are several forms to be submitted for RAJUK's further review. If declined, forms exist for appeal. The land use clearance is valid for 24 months from the date of approval. It can be renewed for 12 months.

Land use clearance is guided by the planning requirements set out in the Structure Plan and DAPs of DMDP 1995–2015. These plans are soon to be replaced with the DMDP 2016–2025 plans. While the new DMDP better meets the current planning needs of Dhaka, the entire land use planning system needs to be updated to become risk sensitive.

The land use clearance process has also been described as complex and long. RAJUK is actively monitoring and reporting on the amount of time it requires the authority to process and approve land use clearance across its eight zones. While the numbers for 2018 are not yet published, preliminary numbers indicate that less than half of the land use clearance applications received and approved in 2018 were processed within the stipulated timeframe (Figure 3).

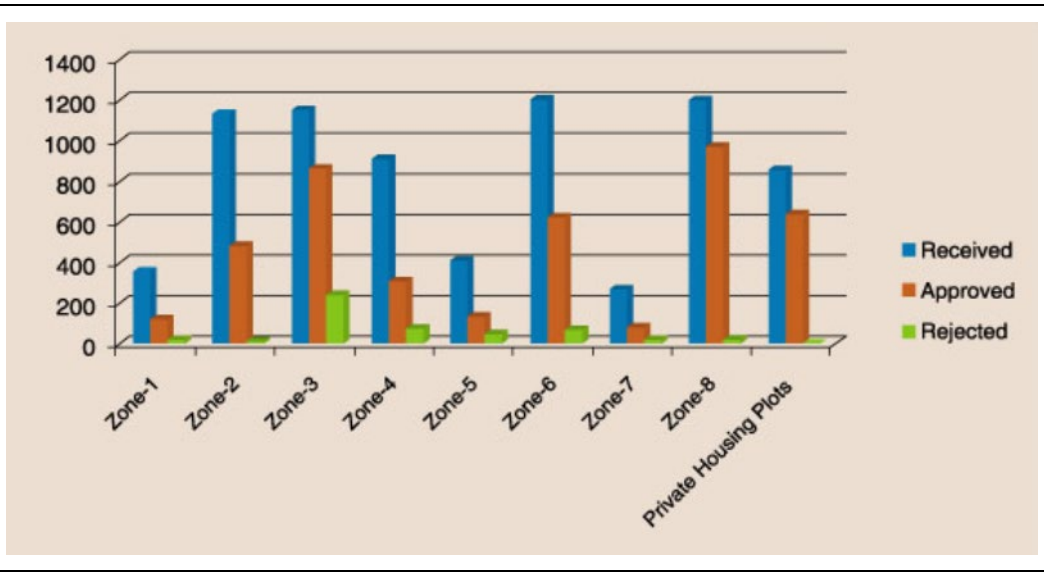


Figure 3. Land Use Clearance Status for RAJUK Zones

2.4.3 Construction Permitting

The construction permitting process is important to urban resiliency because it offers multiple touch points to improve building-resilient design and construction through the plan check and inspections processes, respectively. Additionally, the permitting and construction process is supposed to conclude with a certificate of occupancy, providing some comfort to consumers that a building has met BNBC requirements.

Currently, the process of permitting and construction monitoring is handled by the Development Control Department through its eight zonal offices. These functions do not involve oversight related to DRM, as there is no check of structural designs or monitoring of construction quality. Additionally, it is estimated that only 2% of buildings receive certificates of occupancy, meaning that the vast majority of buildings in Dhaka are occupied illegally.

2.4.4 Permitting Legal Framework

Issuance of construction permits is guided by the Building Construction Act of 1952, as amended, and the Construction Guidelines of 2008 (also known as the Bidhimala).

Building Construction Act of 1952

A primary purpose of the Building Construction Act of 1952 was to prevent the haphazard construction of buildings that would interfere with proper land use planning.

Authority of Authorized Officer and Committee

Primary authority under the Act rests with Authorized Officers, who are appointed by the Government. Notice of the appointment must be published in the Official Gazette. The authority of the Authorized Officer is limited to that which is granted by this Act.

The Government, through notice in the Official Gazette, can delegate the Authorized Officer's authority to a Building Construction Committee. The scope of the Committee's authority is limited to the area specified in the notice. Once this notice is given and authority delegated to the Committee for a specific area, the Authorized Officer can no longer exercise authority over this area.

Requirement for a Permit

No person may construct, reconstruct, or make any addition or alteration to any building, or conduct an excavation, without the approval of an Authorized Officer. The permission granted by the Authorized Officer may be "subject to such terms and conditions as the Authorized Officer may think fit to impose."[20]

Permissions granted by the Authorized Officer are good for three years. After that, the applicant must reapply, unless the building has been built up to four feet above plinth level. No permission is required for normal repairs to existing buildings.

[20] Act, Art 3(1).

Enforcement Powers

A building's use must comply with (1) the use allowed by the Master Plan, and (2) the use approved in the building permit (unless the Authorized Officer gives permission to modify the use). If a use does not comply, the Authorized Officer can order that use be discontinued and the building be vacated and removed.

Similarly, if a construction, reconstruction, addition, alteration, or excavation has been done without permission or in breach of the terms of the permit, the Authorized Officer can order that the building be vacated and removed.

If the deviation can be brought into compliance by altering the building, this will be allowed if the builder pays a fine, obtains approval, makes the correction, and pays ten times the normal fee as a penalty for noncompliance.

Additionally, criminal penalties of up to seven years in jail and/or at least 50,000 daka fine can be imposed for:

- Building without a permit
- Failing to comply with an enforcement order of the Authorized Officer of the Committee
- Designing, approving, or implementing a building construction plan contrary to any provision of the Bangladesh National Building Code
- Constructing a building contrary to any provision of the BNBC.

The Authorized Officer, Committee, or person working on their behalf can make criminal complaints against those who violate the Act.

Immunity

No suit or legal proceeding can be brought against the Government with respect to anything that is, in good faith, done or intended to be done, under this Act.

Additionally, no suit, prosecution or legal proceeding shall lie against *any person* with respect to anything which is, in good faith, done or intended to be done, under this Act.

Construction Guidelines (Bidhimala), 2008

The Construction Guidelines set the process for applying for a construction permit. There are four potential steps to obtaining project clearance:

1. Land Use Clearance (in certain circumstances)
2. Special Project Clearance (for certain types of buildings)
3. Construction Permit (required in all cases)
4. Occupancy Certificate (required in all cases).

Land Use Clearance

If property is within the administrative control of RAJUK, but is outside of areas covered by spatial plans, the applicant first must seek land use clearance. If this does not apply, the applicant proceeds to the next step.

RAJUK must act on this application within 30 days. It can approve the application, imposing any necessary conditions (Form 102), or it can deny the request (Form 103). If the application is denied, the applicant has rights to appeal.

The land use clearance is valid 24 months from the date of approval. It can be renewed for 12 months.

The documents required to be submitted for land use clearance are listed in Annex E.

Special Project Clearance

Some construction projects are considered high risk and require special approval. These are:

- Construction of a residential building having more than 40 residential units
- Any project having a total floor area of more than 7,500 square meters (under floor area ratio [FAR])
- A shopping complex having a total floor area of 5,000 square meters (under FAR)
- Any project having a direct connection with a national or regional highway or main road
- Any industry or factory including brickfields that is dangerous or causes atmospheric pollution
- Any construction or development work within 250 meters of any architecturally or historically important building or area
- Any construction or development work within 250 meters of any area having natural beauty
- Any construction or development work within 50 meters of any hilly region, any land visible as a hill, or any such land
- Any construction or development work within 250 meters of any bank of a river.

The applicant and at least one architect and one civil engineer enlisted as per Rule 41 of the construction guidelines and empowered as per the type of the project are required to sign the Conceptual Drawing and the application.

A Special Projects Approval Committee has 45 days to decide on special projects clearance. Applicants have rights to appeal if the request for special project clearance is denied. A Special Project Clearance is valid for 24 months and cannot be renewed.

Public notice may be required if the project is related to a national interest or could cause adverse effects on the environment.

No technical structural designs are specifically required by the rules, even though these buildings are deemed to require special clearance. There is nothing stated in the rules about the criteria that should be used when deciding on a special project permit.

The documents required to be submitted for special project clearance are listed in Annex E.

Construction Permit

Required construction drawings for construction permits only include architectural plans, drainage information, possibly a soils report if required in a Special Project Permit, fire safety information, parking plan, and elevations. No structural plans are required. In addition, the rules do not set forth criteria to use when deciding on a construction permit application.

RAJUK has 45 days total to decide on an application for construction permit. If additional information is requested, it must be done within the first 15 days. RAJUK has 30 days thereafter to make a decision.

During construction, the applicant is responsible for:

- Ensuring that the construction work is supervised by "technically efficient personnel" (as determined by the professional organizations)
- Ensuring that the approved technical person prepares all the structural, electrical, and mechanical designs and drawings including necessary calculations
- "Bring to the knowledge of the authority" the architectural, structural, electrical, and mechanical designs of the project and the names, addresses, and consent of all the technical persons responsible for supervising the project[21]
- Informing the authority that the work is completed up to plinth level. The authority is then supposed to inspect it.[22] If the authority does not inspect within seven days, construction may continue.

The technical person's responsibilities are described as follows:

- An act of a technical person responsible for a Building shall be treated as his negligence under these rules & regulations if without any valid reason he
  - provides wrong information or conceals any information regarding any important matter or description associated with any particular design and specifications
  - provides wrong information about structural design, fire extinguisher, or other security arrangements, or skips such matters.[23]

Documentation requirements for construction permit applications are listed in Annex E.

Occupancy Certificate

An applicant must submit a completion report, as-built architectural drawings, structural designs, all drawings related to building services, and confirmation from technical persons that the building was completed under their supervision. The occupancy certificate can be denied if the building was not constructed in conformance with approved drawings (although the "approved drawings" do not include the drawings submitted upon completion of construction, such as the structural drawings).

The government is supposed to inspect within 15 days after the request for an occupancy certificate to determine if the building was built per approved drawings.[24]

[21] There is no description of what it means to "bring to the knowledge of the authority".
[22] The nature of the inspection is not specified.
[23] Construction Guidelines, para. 16(3). Note that negligence in this provision is tied only to giving wrong information, concealing information, or omitting information. It does not include what is typically thought of as professional negligence, which is designing or overseeing construction in a manner that fails to meet professional standards. With respect to design at least, this latter form of negligence is picked up in para. 18(3), quoted in the text above.
[24] Note that "approved drawings" do not include any technical drawings.

"All responsibilities of design adequacy and design suitability of all designs... shall fall on the shoulders of the professionals (architects and engineers) associated with the drawings."[25]

As stated earlier, multiple sources estimated that only 2% of all buildings apply for occupancy certificates. Many people interviewed indicated that the reason for noncompliance with the occupancy certificate requirement is because modifications are made during construction—as is typical in construction projects—and they know that they cannot show compliance with approved designs. However, there is a mechanism for getting approval for changes during construction.[26] This mechanism should be reviewed carefully to determine if changes can be made to make it more accessible.

Inspection, Duties, and Responsibilities of Authority

The Authority or any officer empowered by the Authority can inspect the construction work of a building or the project anytime from sunrise to sunset and can check if the work is being carried out as per approved design, report, and specifications.

The Authority can stop work, order corrections, or demolish the structure if work is being performed in violation of approved drawings or special project clearance, or work is a threat to environment, life, or property.

The Committee has authority to supervise conformity of construction with building construction rules.

2.4.5 Existing Construction Permitting Process

RAJUK Development Control reviews and processes applications for building permits for eight zones (each divided into three subzones). Applications for building permits are increasing substantially per year. In 2014–2015, 3,751 construction permit applications were received, and in 2016–2017, an estimated 5,500 applications were received.[27] In 2018, an estimated 6,000 applications were processed, while a further 9,000 permits were open and in construction over the 24 subzones. In terms of building types being permitted per year, the estimated breakdown is shown in Table 2.

Table 2. Building Types by Number of Stories

	Number of Stories		
	6 or fewer	7 or 8	9 or more
% of total	50%	20%	30%

The building permit application fee varies based on the size of the building, with an average of 0.5 Taka per square meter.

Table 3 (adopted from RAJUK annual reports) is a summary of construction permits received and approved or rejected by RAJUK for the years 2014 through 2017. Note the following:

- Approximately half of submittals are in zones 3 and 4. Thus, it is critical to use these zones as pilot projects for the URU.

[25] Construction Guidelines, para. 18(3).
[26] *Id*., para. 26.
[27] RAJUK Annual Report, 2014–2015; RAJUK Annual Report, 2016–2017

- The number of applications has increased significantly in recent years due to the rapid development of the city. This trend is expected to continue as internal migration and urbanization is ongoing and so is the need for development.
- In the last two years, approximately 10% of applications have been rejected.

Table 3. Summary of Construction Permits Received, Approved, and Rejected

	2014–2015			2015–2016			2016–2017		
	Received	Approved	Rejected	Received	Approved	Rejected	Received	Approved	Rejected
Zone-1	45	44	1	181	174	7	355	323	32
Zone-2	644	632	12	562	420	142	529	484	45
Zone-3	736	705	31	531	487	44	1,346	1,208	138
Zone-4	725	698	27	1,041	1,006	35	1,227	1,184	43
Zone-5	466	456	10	249	245	4	229	226	3
Zone-6	732	712	20	1,176	1,009	167	1,290	1,140	150
Zone-7	158	151	7	155	138	17	137	133	4
Zone-8	251	239	12	330	284	46	441	429	12
Total	3,757	3,637	120	4,225	3,763	462	5,554	5,127	427

Existing Construction Plan Approval Process

Figure 4 (provided by RAJUK Development Control) outlines the internal process for manually reviewing and approving construction permits. There are approximately 26 Building Construction (BC) Committees that receive construction plan applications for final review and approval. The committees each have five members, including officials nominated from the Public Works Department, Department of Architecture, National Housing Authority, and RAJUK. There are different committees for (1) buildings that are 8 stories or less than 33 meters in height, or 5,000 square meters, and (2) buildings that are more than 33 meters in height, or larger than 5,000 square meters. The latter are referred to as large or special projects. Figure 5 presents the building construction approval process.

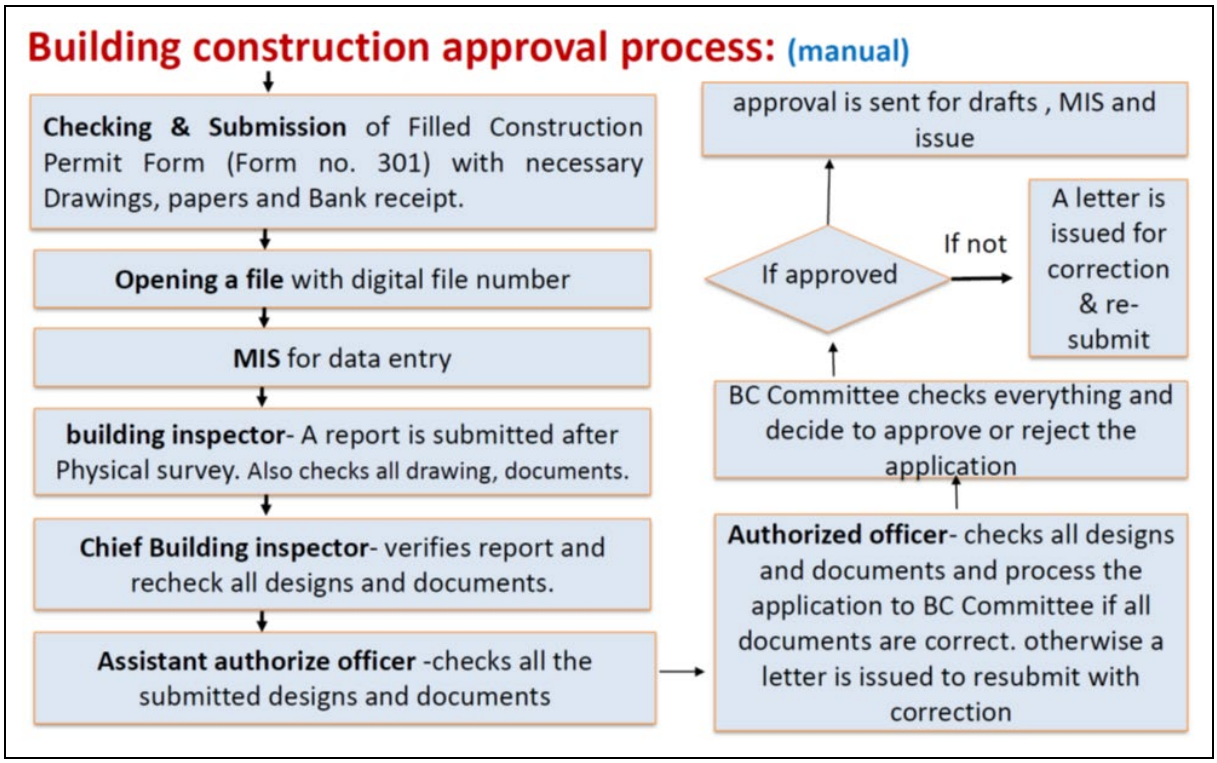


Figure 4. Building Construction Approval Process

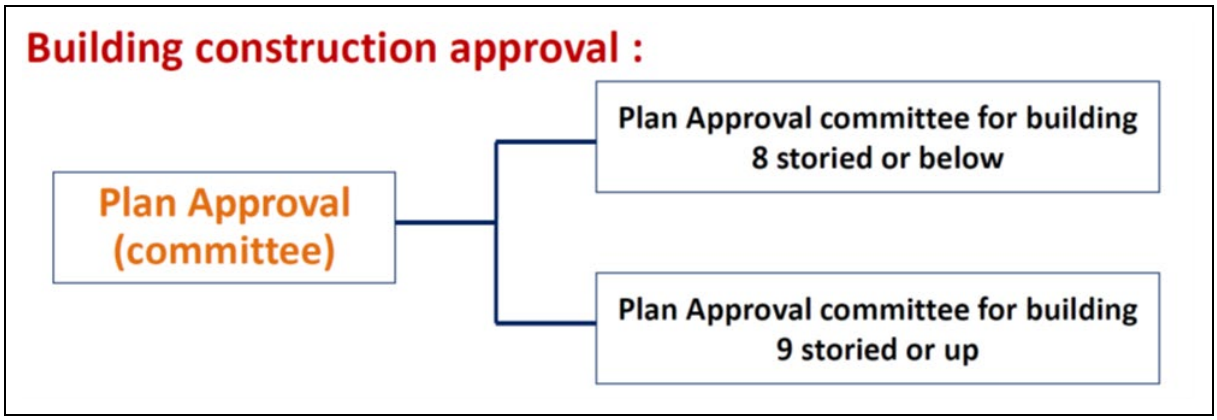


Figure 5. Building Construction Approval Process by Committee

It is mandatory that both the architect and engineer of record sign the construction plan application forms. The IAB and IEB have provided a list, including personal data, of qualified architects and engineers to RAJUK. Personal data submitted for each RAJUK registered architect or engineer includes a professional number that specifies what the individual can and cannot design (building size/complexity/special designations), as well as a specimen of their signature. RAJUK staff assert that they take great care in verifying the signatures of the professionals (and at times also call them to verify their participation in project), but there are allegations that signature fraud is a persistent issue. Some architects and engineers also collect fees for use of their signature, while not being involved in the building designs. Consequently, construction quality can suffer and building safety is at risk.

When considering Bangladesh's seismicity, and comparing the permit approval process between RAJUK and practices followed in other countries, the main difference is plan review/approval of

disciplines other than architectural, such as structural, mechanical, electrical, plumbing, and fire. These reviews are mostly conducted regardless of number of stories and are seen by governing agencies as a mandatory precaution to account for public safety and ensure building code compliance and that critical provisions are in place in case of natural disasters such as fire and earthquake. Currently, these reviews are not mandatory or carried out by RAJUK.

Current Online Application System for Construction Permits

A pilot program for electronic building application submittal and approval is in use in Zones 3 and 4. It is hoped that most applications will be processed electronically by March 2019. The system was initiated to increase efficiency with the goal of reducing the permitting time. However, there are some challenges and limitations with the current electronic approval process, including Internet and server problems, issues with the software not being fully developed, and the fact that not all departments are online or connected to this system (e.g., DAP maps not available on the system for review). Figure 6 (provided by RAJUK) presents a flowchart for the current electronic construction approval process.

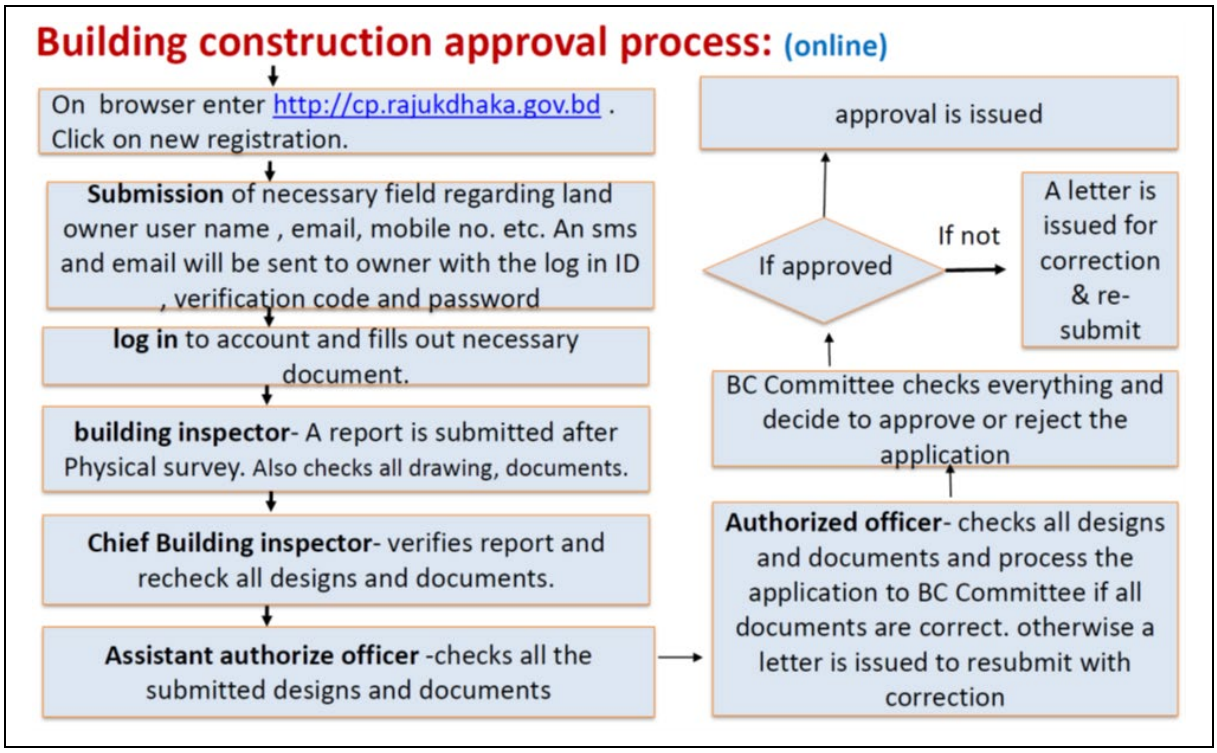


Figure 6. Online Building Construction Approval Process

The approval time for RAJUK to process construction permit applications is set for 45 days, but approval takes longer in many zones. Preliminary statistics indicate that across all eight zones, 50–60% of applications for construction permits are processed in less than 45 days. While in Zones 3 and 4 (which use the online system), zonal officers estimate that 80% of the building permit applications are reviewed within 25 days. In some cases, longer review times are due to issues brought up to the owner during review and the owner's response time to the issues. RAJUK staff also feel that difficulty accessing the DAPs, which are only accessible in RAJUK's Planning Department, adds time to the review.

Large Projects and Non-Objection Certificate for Construction Permit

If a building is above 33 meters in height or larger than 5,000 square meters, before applying for a construction permit, applicants must first obtain clearance from up to 11 different governmental agencies:

- Dhaka Power Distribution Company (DPDC) for electrical load requirement
- Dhaka Electricity Supply Company (DESCO)
- Dhaka Electricity Supply Authority (DESA)
- Dhaka Water Supply and Sewage Authority (WASA) for water consumption requirement
- TITAS Gas Transmission & Distribution authority for gas requirement
- Bangladesh Fire & Civil Defense (FSCD) for fire safety drawing clearance
- Civil Aviation Authority of Bangladesh (CAAB) for building height permission
- Dhaka Transport Coordination Authority (DTCA)
- Dhaka City Corporations, North and South (DNCC and DSCC)
- Bangladesh Department of Environment (DoE) for environmental clearance
- Dhaka Metropolitan Police – Traffic (DMPT).

The clearance comes in the form of a Non-Objection Certificate (NOC). Each agency has its own prescribed application forms with fees.

Obtaining NOCs has been described as a major challenge by private-sector real estate developers serving the Dhaka area. The contracting of a middle man is common practice. The middle man deals with the various applications and lobbies the various agencies/officials to respond and sign off on the applications. On average, it is estimated that this process can take 8 to 12 months. This impacts the economics of the development projects and hampers the private-sector real estate market.

Currently there is an initiative underway under the Ease of Doing Business Working Group chaired by the Bangladesh Investment Development Authority (BIDA), including RAJUK representation, that aims to improve the regulatory environment of Dhaka/Bangladesh. As a result of this working group, there is renewed incentive for RAJUK to coordinate with other agencies to reduce the number of NOCs required for special projects.

Existing Construction Monitoring (Inspections) Processes

Figure 7 (produced by RAJUK) presents the process of RAJUK's construction monitoring. Before construction starts, the inspector visits the site to verify that the site plan matches the existing conditions for setbacks, road widths, and other site requirements, including any safety issues related to construction encroaching on roads/walkways. The inspector then is supposed to revisit the site after the owner/contractor finishes plinth (everything to ground floor) to again verify that construction is carried out per plans and there are no deviations. After the first elevated floor has been completed, another inspection is supposed to occur. Thereafter, periodic inspections can be performed as per the chief inspector's instructions (usually requests inspectors to visit the site to inspect each new story constructed). There is no mandatory final inspection once the owner declares construction is completed with Form 401. Contractors indicate that sometimes these inspections occur, but often they do not.

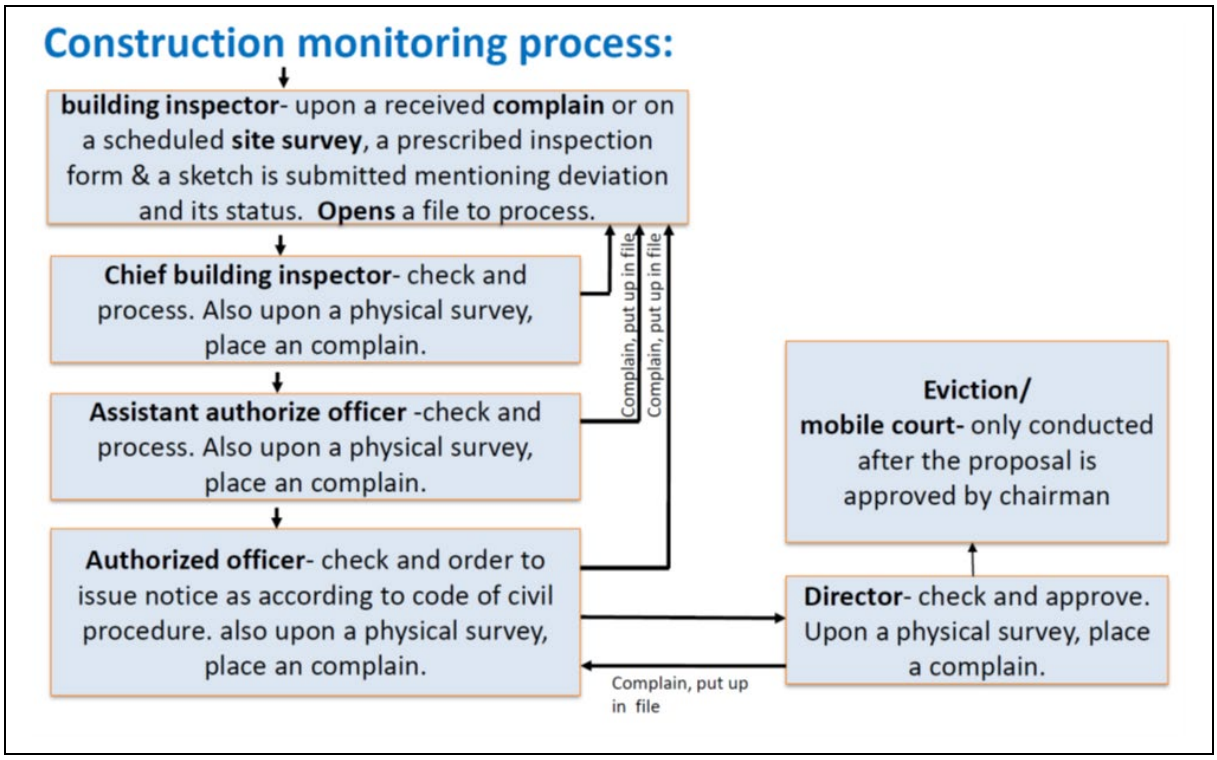


Figure 7. Building Construction Monitoring Process

Quality of Construction/BNBC Compliance

Similarly, as with the plan review and approval, during construction RAJUK does not inspect or verify structural or material quality. Hence in consultation meetings with inspectors, chief inspectors, and assistant authorized officers, no data could be provided on the level of building code compliance. The inspectors showed concern around construction quality/safety on some of their sites, especially with construction projects that were not managed by larger developer/contactor groups.

Material Testing on Site

Currently there is no requirement for verifying concrete strength or conducting rebar tests. Certificates for these tests are not required by RAJUK. If cylinders are tested, the engineer of record may or may not see the test results.

Manpower, Logistics, and Equipment

RAJUK currently has 135 inspectors for eight zones, which is 105 positions less than allotted in the official organigram. This staffing shortage is particularly difficult for inspectors since they are involved with plan review and are responsible for on-site inspections. There is also a shortage of transportation and equipment for on-site inspections during construction. The inspectors typically use their personal cell phones when they are out of the office. When measuring floor dimensions and areas, standard tape measures are typically used instead of devices using laser and targets. Inspectors also complain of not having uniforms that would allow contractors to more easily verify their identity and authority.

Training

Inspectors are trained in office management, which covers topics such as how to communicate and behave as an inspector and government official; how to open, manage, and input data in a file (a new

file is opened for each new construction permit); and basic information on the BNBC. Training for inspectors is also done through a mentoring process on-site during inspections. However, more detailed engineering/technical training and training on RAJUK's and enforcement/construction regulatory framework and process is lacking. The result is (1) a lack of uniformity among the eight main zones, (2) failure to enforce permit requirements and the BNBC, and (3) difficulty handling paperwork and processes related to court cases.

Process for Monitoring and Reporting Deviations

Per the regulations, if deviations from the plan occur during construction, the architect or engineer of record is required to send a letter to RAJUK with plan changes. In practice, this does not seem to take place. Inspectors across Zones 2, 3, and 4 report that design engineers (engineers of record) are almost never seen on site, and that construction is managed by a new team of construction engineers (who may or may not be familiar with the structural plans). The architecture and engineering communities also report that an ongoing issue is a lack of engagement during construction. Owners do not typically contract them to provide construction supervision services. This means that they are not informed when changes to plans occur during construction. Nevertheless, both architects and engineers are responsible for the construction work until an occupancy certificate is issued.[28]

RAJUK follows a four-step process when deviations are observed during an inspection. First, the inspector notifies the owner/contractor verbally on site that a deviation needs to be corrected. If this is not done, RAJUK sends owners a first notice requesting them to resubmit the plans for RAJUK approval. These plans can then be used for follow-on inspections. If the owner fails to satisfy this request, a second notice is sent requesting more information on the reasons for plan deviation. The owner is required to respond to RAJUK and either provide a newly approved plan or correct the deviation. A third and final notice is given requiring construction to be corrected, or RAJUK will employ measures including eviction and demolition. Owners have seven days to comply with this notice. These notices are also sent to the police and architect/engineer of record.

Enforcement Measures

Mobile Court. RAJUK has access to mobile courts where inspectors can prosecute claims that a builder has violated construction rules or the scope of a permit. These courts operate under the Mobile Court Act and are presided over by Executive Magistrates. They are located in various zones/sites. The mobile courts typically issue decisions like imposing penalties/fines or directions towards removing unauthorized constructions.

The mobile courts are designed to provide more accessible and rapid access to justice. If an alleged offender accepts the charges against him/her, then the Executive Magistrate is empowered to enter a verdict. Verdicts can be for fines or even jail time up to two years. If the alleged offender contests the charges and the magistrate finds the defense persuasive, the magistrate can dismiss the charges. However, if the magistrate does not find the defense persuasive, the matter has to be referred to a higher court. RAJUK staff say that such referrals are the norm. RAJUK is then no longer authorized to implement enforcement measures until the case is settled, which can take years.

Evictions. While evictions do occur, these need to be authorized by RAJUK's Chairman and the Development Control staff require support from the police. The process to request police assistance is

[28] Construction Guidelines, para. 16.

lengthy and bureaucratic, and the police regularly are not available to ensure safety and security at eviction sites. This prevents RAJUK from carrying out its enforcement actions. Table 4 is a summary of eviction measures taken in parts of 2016 and 2017.

Table 4. Eviction measures from July 2016 to June 2017

Zone	Ramp Eviction	Eviction of Unauthorized Structure for Residential Building	Eviction of Unauthorized Use from Parking Place	Fine (in lac)
2	170	27	134	1.39
3	53	173	224	6.50
4	339	46	265	1.01
5	11	54	155	318.1
6	206	5	15	3.70
Total	779	605	793	330.70

Source: Annual Report 2016–2017

Demolition. While the owner pays for the demolition costs, RAJUK's Development Control Department typically carries out the demolition works and charges the owner. Demolitions are carried out manually with a lack of proper safety equipment.

Existing Process for Issuing Occupancy Certificates

Issuing a Certificate of Occupancy after construction is complete is a challenge. As detailed below in the *Bangladesh Post* (3 September 2018)[29]:

> *Despite legal bindings to the effect, 99 percent of the buildings in Dhaka city have no occupancy certificates.*
>
> *According to sources, Rajdhani Unnayan Kartripakkha has been issuing around 5000 permissions for building construction each year since 2008. Based on the data, RAJUK has issued construction permission to some 40,000 buildings in the past ten years, of which only 162 have occupancy certificates, obligatory to acquire from RAJUK under Section 18 of Dhaka Metropolitan Building Construction Act of 2008.*
>
> *The Act stipulates that once the construction or part of construction of a building is completed, a certificate will have to be obtained before the building cannot be used in part or in whole. The occupancy certificate will be valid for five years, and must be renewed after every five years. According to RAJUK's Development Control Branch, every year the designs of five thousand new buildings from RAJUK are approved. These designs are valid for the next three years after the grant of permission. Eighty percent of the designated designs lead to an annual construction of buildings. Since the formulation of the rule on construction of metropolitan city buildings, a mere 162 buildings have obtained certification.*
>
> *A responsible official of RAJUK's development control unit said on condition of anonymity that in many cases deviations from original designs were being resorted to during construction. During construction, owners make a one-and-a-half-feet increase on the right-hand side of the design or make eight or nine stories where they have*

[29] https://www.bangladeshpost.net/99pc-dhaka-buildings-have-no-occupancy-certificate/

permission for eight floors. Even when original construction designs are not followed, no action is taken against these building owners.

The public and building owners do not see the benefit of obtaining a Certificate of Occupancy, mainly due to a lack of external triggers that would require them to get this final approval. In developed countries, most real estate development uses bank or other funding, and banks will require Certificates of Occupancy. However, most buildings in Dhaka are built without bank financing. Buildings also are not insured, so insurance companies are not demanding Certificates of Occupancy. Buildings can be registered in the property rights registry and sold without a Certificate of Occupancy. There reportedly is a regulation in place that provides that a building cannot be connected to utilities without a Certificate of Occupancy. However, this regulation is not followed, and buildings get connected to water, gas, and electricity even without this certificate. In general, there is a lack of support for RAJUK from other agencies, including utilities (water, electricity, and gas), police, professional organizations, and courts for cases of non-compliance to approved building permits and a tolerance for building occupancy without authorization.

Another critical reason why developers/owners do not receive Certificates of Occupancy is associated with the current processes and practices related to deviations during construction. Field modifications are very common during construction, including floor area ratio, total floor area, setbacks, number of floors, basement, and building occupancy. While the Construction Guidelines provide procedures for requesting modification to approved plans during construction, owners, contractors, and construction professionals (including architects and engineers) do not follow correct regulatory processes. The reason for non-compliance is not clear, but it may be that the process is unknown or too burdensome. It is likely that issuance of Certificates of Occupancy will increase upon introduction of a more effective mechanism that allows for rapid approval of field modifications by owners and contractors during construction.

Current Status of Adherence to and Enforcement of Existing Rules and Regulations

Most building owners do apply for a building permit. However, only 1–2% of approved construction projects obtain a Certificate of Occupancy. Preliminary numbers for 2018 show that approximately 65 occupancy certificates were issued for a pool of about 5,843 approved construction projects.

With a lack of compliance during construction, building owners make modifications to the buildings that can affect structural integrity and safety. These changes include additional stories, increasing plan area, cantilevering upper floors beyond required setbacks, and extending ramps into the street.

Adherence to core requirements for all development projects to obtain a Certificate of Occupancy upon completion is paramount to ensure the safety and resilience of Dhaka.

2.4.6 Current Status of Enforcement of the Bangladesh National Building Code

There is currently no enforcement of the BNBC-2006 prescriptive requirements for structural provisions. In terms of building structural safety, structural drawings are not reviewed for code compliance during the permitting process. However, these structural drawings contain the lateral force resisting systems and special detailing prescribed by the building code to improve safety during an earthquake.

The first BNBC was drafted in 1993, based on the 1991 Uniform Building Code (UBC), and was adopted in 2006. Per the code, Central Dhaka is considered seismic zone 2, which is a low seismic risk zone. The current BNBC is based on 300-year seismic maps, which underestimate seismic demand by 20%. This is contrary to recent research on seismic hazard in Dhaka.

While the 1991 UBC code has fundamental seismic provisions, it does not contain updates resulting from the lessons learned from recent earthquakes such the 1994 Northridge Earthquake. The proposed BNBC-2017 is based on the ASCE 7 standard, which has the latest seismic provisions. However, BNBC-2017 has not been formally adopted. These gaps described here have significant impact on earthquake risk in Dhaka.

2.4.7 Current Awareness and Use of Disaster Risk Management and Earthquake Engineering Best Practices

Interviews with RAJUK's development control staff, including building inspectors, Assistant Authorized Officers, and Authorized Officers, indicated that earthquake risk mitigation was considered a top priority. Staff frequently pointed out that RAJUK does not have a regulatory framework or processes in place to review structural drawings, which they recognize as critical for ensuring compliance with the building code and its life safety standards. With no provision to review building code compliance, there currently is also no structural or earthquake engineering training for RAJUK's building inspectors and development control staff to educate on building safety.

Additionally, a number of people interviewed (including within the Institute of Engineers) voiced the opinion that earthquakes were not a threat to buildings in Dhaka because "buildings are always over-engineered." This indicates a lack of awareness of earthquake risks and earthquake engineering best practices.

2.4.8 SWOT Analysis Related to Functions/Operations of RAJUK Related to Disaster Risk Management

Strengths

- Although revisions are needed, the basic legal framework is in place to enforce proper construction permitting practices.
- There is almost uniform compliance with *some* parts of the construction permitting system, in that virtually all projects seek and receive a construction permit.
- RAJUK has been tracking statistics related to construction permits and can rapidly adapt to the additional data gathering and reporting capabilities of the ECP.
- Complementary efforts are underway to examine and potentially streamline the permitting process.
- RAJUK has taken positive steps to improve functionality, such as through the on-line land use clearance and construction permitting systems for Zones 3 and 4, and this bodes well for future improvements.

Weaknesses

- Consumers see RAJUK as an institution that creates obstacles but does not add value to their projects or the development of the city.
- An agreed informal system for procedures and payments is superimposed on the written formal system.
- There is very little recognition of earthquake and other risks and the market does not demand resiliency or certificates of occupancy.
- Structural plans are not checked, construction is not adequately monitored, and the updated version of the BNBC, which is more protective against earthquake risks, has not been adopted.
- Enforcement efforts are being frustrated by lack of resources, including logistical and legal support.

Opportunities

- The URU can help lift the performance of the entire RAJUK organization by adding important new functional capability toward the goal of a more resilient Dhaka (e.g., the testing and research laboratory, communications and training, public education).
- There is a current opportunity within the present initiative to bring together professionals and other stakeholders to work together to improve the current situation.
- RAJUK now has technical support to provide international quality guidance to help navigate this change process, which should be critically appraised and applied where appropriate.
- Various reform efforts are underway which, if coordinated, will benefit the resiliency goal (e.g., BIDA efforts to streamline the permitting process to better the country's Doing Business ranking for dealing with construction permits, efforts to update the Construction Guidelines and adopt the revised BNBC).
- Because most people do receive a construction permit, this evidences societal agreement with at least some part of the system that can form a platform for encouraging further compliance.

Threats

- Efforts to streamline permitting processes need to apply a resiliency lens to ensure that steps that further resiliency are not deleted in the enthusiasm to reduce red tape.
- Attempts to introduce reforms can be undermined by the current system of informality and may be actively opposed by vested interests—both internal and external—that benefit from the current system.
- Departments within RAJUK have their own areas of responsibilities. As the functions of the URU are cross-cutting to these functions, there is the risk that territoriality will resist coordination and collaboration.
- For the project to be successful, the URU needs to be very good at managing the network of organizations that contribute to DRM. Disaster resiliency will not be successful if this coordination does not occur.

- Changes to the policies, procedures, regulations and laws may be needed to support the URU and new reforms. These changes may take longer than the current project period.

2.4.9 Cross-Dhaka Collaboration

URP Components

URP/RAJUK/S-4	Vulnerability Assessment and Prioritized Investment Plan for Critical Assets
URP/RAJUK/S-5	Development of a Risk Sensitive Land Use Planning Practice
URP/RAJUK/S-7	Electronic Construction Permitting
URP/RAJUK/S-9	Building Code Enforcement
URP/RAJUK/S-11	Design and Supervision of URU Building including Research, Training and Testing Laboratory Facilities

Relationship with Other Stakeholders in the Construction Sector (Academia, Civil and Public Sector) and Their Role

Academia, civil, and private-sector stakeholders were consulted as part of the situational analysis on the URU and its role and future functions. A partial list of the consulted organizations includes the (1) Institution of Engineers Bangladesh (IEB), (2) Institute of Architects Bangladesh (IAB), (3) Bangladesh Association of Construction Industry (BACI), (4) Bangladesh University of Engineering and Technology and its Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS), and (5) Real Estate and Housing Association of Bangladesh (REHAB). During the meetings, the organizations offered very similar feedback regarding the permitting and construction process in Dhaka, as well as information on the construction sector in general. All organizations seemed supportive of the URU.

Table 5 summarizes key points from the meetings.

Table 5. Key Messages from Stakeholder Consultations.

General	
1.	There are more than 40,000 engineers practicing in the city of Dhaka.
2.	Has a list of architects certified to design buildings that are (1) 5 stories or fewer, (2) 6 to 12 stories, and (3) unlimited. This database can be linked with the electronic permitting platform so RAJUK can verify if the architect and engineer are authorized for the building design during the plan review phase.
3.	The organization is composed of more than 90 members representing construction companies.
4.	More than 1,500 members. RAJUK requires developers to be registered members of REHAB.
5.	The Institute of Disaster Prevention and Urban Safety of the public university and highly recognized as the technical thought leader in Bangladesh on disaster risk reduction and building sciences/earthquake engineering.

(continued)

Table 5. Key Messages from Stakeholder Consultations (continued)

	RAJUK Organization and Operation
1.	RAJUK appears more focused on development, and there is some inefficiency that needs to be addressed.
2.	RAJUK is a regulating and development agency, and they do their own construction and development. Organizational reform is needed.
3.	RAJUK is not a modern organization, not dynamic. It is tough to get through the process. The system is not working. There is a need for motivational courses at all levels (from the chair to the inspectors). The main business of RAJUK is buying land and developing. RAJUK should have two independent departments: (1) Building Regulation and (2) Development.
4.	Members view RAJUK as an unfair competitor in the real estate market with more favorable terms.
5.	There is concern regarding readiness of RAJUK to enact urban resiliency. Change is required at all levels to modernize the organization. The construction sector is the most unregulated sector. RAJUK could be a model and leader for other development authorities once the URU is established.
	Permitting and Plan Review
1.	The structural plans should be included in the permit submittal, and the engineer signing the drawings should be a member of IEB.
2.	Forging signatures is a serious problem. There needs to be more stringent checks.
3.	RAJUK does not communicate with contractors regarding status of permit. For example, when form for Certificate of Occupancy submitted; if contractor sends somebody to follow up, they may receive it in 7 days. For buildings over 10 stories, structural plans are included in the submittal, but with limited structural information. If a plan is submitted with all the information, approval may take 6 to 12 months.
4.	The system is corrupted and fraught with problems. It hampers development. NOCs need to be collected from 11 agencies. This can take up to 1 year.
5.	RAJUK does not review buildings for structural and fire safety; mostly architectural. Structural reviews are important for BNBC compliance and urban resilience.
	Construction Inspection
1.	The design team relies on RAJUK inspectors to check all aspects of the building during construction, but the staff covering all 8 zones is very limited (130 inspectors total).
2.	IAB has developed plan review checklists and a building rule guide. These have sent to RAJUK but are not used.
3.	RAJUK is overwhelmed. More inspectors are needed to cover all construction in progress in the 8 zones. There are currently 130 inspectors, but they need closer to 500 inspectors. RAJUK should have design review engineers and construction engineers. There is nobody available for on-site inspection with engineering knowledge. Design engineers needs to perform periodic structural observations.
4.	Improvements to the entire construction permitting system are required.
5.	Stressed the importance of public safety to the engineers and provide training to build confidence to make decisions regarding changes in the field.

(continued)

Table 5. Key Messages from Stakeholder Consultations (continued)

	Resiliency/Project Sign Off/Certificate of Occupancy
1.	To build resiliency, the structural engineer signing the drawings must also visit the construction site periodically during construction, but typically the engineer is not retained by the owner for this service.
2.	Agrees with accountability until project sign off.
3.	Building utilities (e.g., gas, water, electricity) are connected and turned on even without a Certificate of Occupancy.
4.	RAJUK does not obtain occupancy certificates for their own developments and so cannot enforce this on the private sector. Infrastructure resilience in Dhaka needs to improve. However, it does not appear that the market is willing to pay higher prices for code-compliant and resilient buildings.
5.	The URU is very important.
	Outreach
1.	Public outreach regarding structural safety and certified buildings is very important for resiliency.
2.	There are existing vulnerability reports, special zones (liquefaction) and Vs30[30] data for the entire city of Dhaka.
3.	RAJUK should also focus on noise, dust, and pollution at construction sites; environmental impact, some smaller contractors store materials in the street or place concrete without pumps or machines. Typically small contractors hire various laborers; no management or organization. RAJUK should recognize those contractors that are doing things right and following the laws.
4.	Shaking was felt during the 2015 Nepal earthquake. Earthquake awareness is increasing in Dhaka.
5.	BUET-JIDPUS organizes seminars and training for engineers including geotechnical investigations and seismic retrofitting. RAJUK staff participate in these trainings.

Other important linkages with academic, civil and private sector stakeholders and the URU are described in the following sections.

BUET-JIDPUS

BUET-JIDPUS serves RAJUK in various technical advisory capacities and provides training to its staff. RAJUK also frequently contracts BUET to provide advisory and engineering services on RAJUK's development projects.

BUET-JIDPUS manages a material testing laboratory. It is referred to as the most reliable construction material testing facility in Bangladesh. Consequently, it is also reported that there are at times delays in obtaining test results due to the demand for BUET's testing services. This indicates that there is insufficient supply in the market of reliable (quality and timeliness) construction material testing. The

[30] the time-averaged shear-wave velocity to 30 m depth. It's a way of measuring earthquake hazard vulnerability.

new state-of-the-art laboratory facility at the URU can meet this demand, while also generating income for URU's operations.

Architects and Engineers (IAB and IEB)

RAJUK's Development Control Department maintains a list of architects and engineers who have been approved by IAB and IEB, respectively. Architects and engineers have membership numbers, which also provide information on the types/sizes of building they are permitted to design.

The limitations of the current registration/categorization system of IEB engineers is that no earthquake engineering training or knowledge test is required by the IEB or the Bangladesh Professional Engineers Registration Board (BPERB) for engineers to be able to design higher risk buildings. A more rigorous licensing or accreditation system for engineers with mandatory advanced earthquake engineering training is necessary to ensure better building code enforcement and infrastructure resilience. Furthermore, accountability amongst building owners and engineers is also required to ensure not only that the structural designs conform to code requirements, but that construction meets code and quality standards.

Developers and Owners

In accordance with the Real Estate Development and Management Act, 2010 and 2011, RAJUK's Development Control Department registers developer companies. Per the regulations, all real estate developers are required to be members with REHAB. REHAB has a set of requirements members need to meet to be registered with the association. Currently there are only 1,500 registered REHAB members in Bangladesh. High interest rates and obstacles, including issues with the current permitting process (specifically with obtaining NOCs), prohibit many real estate developers from growing. This has adverse impacts on the development and professionalization of the real estate industry and can affect construction quality/resilience.

There also seems to be a lack of respect amongst developers and owners for RAJUK. This negatively affects its regulatory authority.

While larger developers are familiar with building regulations, many owners are not versed in RAJUK's processes and regulatory framework. This also creates challenges for RAJUK.

3 International Best Practices in Resilience

This section reflects the results of a study of international best practices in disaster resilience. The following entities provide structures, services, resources, and trainings that have been indicated as key components of the URU, described in terms of their legal, functional, operational, capacity, and social (outreach) structures/capacity.

The institutions selected for study are:

- Building Construction Authority (BCA), Singapore
- Center for Housing and Settlement Research and Development (PUSKIM), Indonesia
- Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP), Turkey
- National Society for Earthquake Technology (NSET), Nepal
- Pacific Earthquake Engineering Research Center (PEER), USA
- Earthquake Research Institute (ERI) at University of Tokyo, Japan.

Most of the entities reviewed were identified to support and promote earthquake resilience research, although the research type depended heavily on the type of institution (e.g., academic, government). The involvement with resilient building regulation was strongly dependent upon the type of institution. Only entities that existed within or with joint collaboration with government assisted in permitting, building code enforcement, or inspections. Additionally, assistance with permitting and inspections activities were noted to require a significant increase in staffing. In all cases, successful establishment of the functions required several years or decades, as well as support at multiple levels in the government. Table 6 presents a summary of the structure and functions observed across the studied best practice entities.

Table 6. Overview of Best Practice Entities

Entity	Location	Entity Type	Resilience Research Component	Permitting Component	Entity Size
BCA	Singapore	Authority under Ministry	Yes, built environment research institute function	Streamlining, permitting, building code enforcement, inspection	> 1,200
PUSKIM	Indonesia	Authority under Ministry	Yes, supporting policy and technology development	No	~200

Entity	Location	Entity Type	Resilience Research Component	Permitting Component	Entity Size
ISMEP	Turkey	Cross-ministry funded project	No	Streamlining, development of electronic permitting, implementation of code enforcement	Leveraged across ministries
NSET	Nepal	Non-governmental organization formed from working group	Yes, earthquake technology and technical support	Assists communities with improving building code implementation	~225
PEER	United States	Non-governmental organization formed from national funding project	Yes, earthquake technology and technical support	No	Leveraged across institutions
ERI	Japan	Academic research institute	Yes, earthquake technology and technical support	No	~230

3.1 Singapore Building and Construction Authority

In 1995, the Ministry of National Development launched the Construction and Real Estate Network (CORENET) to improve coordination and transparency among stakeholders involved in building project development (e.g., developers, planning and permitting agencies). The BCA was then established by the Ministry of National Development in 1999 to implement CORENET, regulate the construction sector, and provide outreach and guidance to the sector. BCA's mission is to ensure a "safe, high quality, sustainable and friendly built environment."[31] BCA is a separate agency under the Ministry.

Strategic goals outlined by the BCA include ensuring safety and quality in the building sector, spearheading sustainable practices through incentives and research, strengthening the technical skills and inclusivity of Singapore's workforce, adopting and promoting emerging technologies, and developing partnerships with stakeholder and the community[32]. Figure 8 presents BCA's organogram.

The CORENET e-permitting system, launched in 2002, provides a platform for 16 regulating authorities and 8 government ministries to monitor, evaluate, and regulate construction projects.[33] BCA credits

[31] https://www.bca.gov.sg/AboutUs/about_bca.html
[32] https://www.bca.gov.sg/AboutUs/our_functions.html
[33] https://buildingsmart.no/sites/buildingsmart.no/files/Case_studie_Singapore.pdf

stakeholder engagement, a three-year transition period to online submissions and one-stop shop operations, trainings, and careful monitoring of system performance and user satisfaction as the key elements of sustaining the high compliance and building performance indicators associated with CORENET.[34] BCA's current areas of interest are green buildings, design for manufacturing and assembly, and integrated digital delivery. BCA promotes these initiatives through partnership with industry and with other regulatory sectors, providing training and outreach materials to transform Singapore's workforce to highly-skilled professionals, and providing incentives for initiative adoption.

[34] https://www.tech.gov.sg/files/media/media-releases/2013/04/factsheetBCAsCORENETpdf.pdf

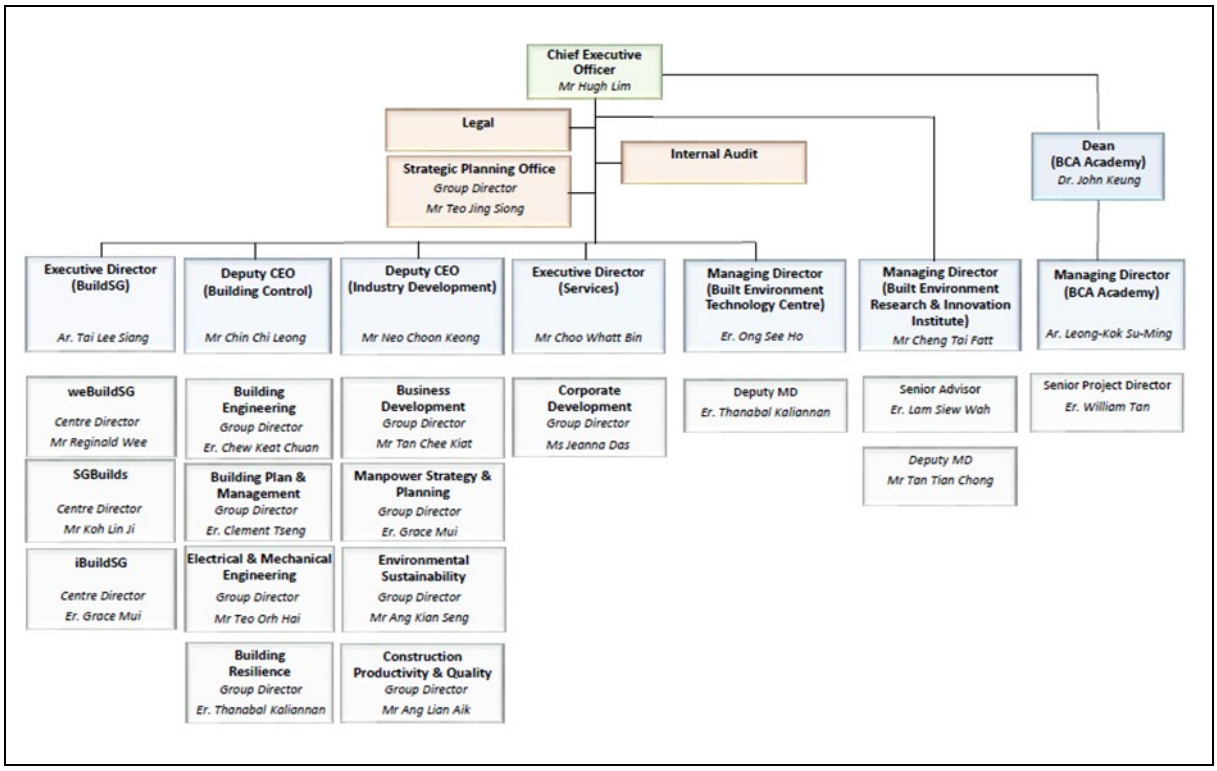


Figure 8. 2019 BCA Organization Structure[35]

An example listing (not exhaustive) of activities within the BCA that support urban resilience are summarized below.

Regulatory Assistance

- Guidance for considering seismic actions— https://www.bca.gov.sg/StructuralPlan/others/BC3-2013.pdf
- Seismic building analysis example calculations— https://www.bca.gov.sg/StructuralPlan/others/BC3-2013_cal.pdf
- Flooding checklists— https://www.bca.gov.sg/PerformanceBased/others/DM_Checklist_2016.pdf

Communication and Outreach

- Two-part program comprising (1) preliminary design of high-rise buildings and (2) introduction to seismic design. The program aims to allow participants to understand the importance of addressing structural needs at the preliminary design stage of the project and to know the effect of distant earthquakes on buildings in Singapore— https://www.corenet.gov.sg/document-151137.aspx
- What to do during tremors—https://www.bca.gov.sg/Tremors/Tremor.html

[35] https://www.bca.gov.sg/AboutUs/org_structure.html

- Periodic structural inspections handouts and FAQs—https://www.bca.gov.sg/Periodicstructuralinspection/others/psi_leaflet_safebldgs.pdf, https://www.bca.gov.sg/PeriodicStructuralInspection/others/PSI_owners.pdf
- Fire safety education—https://www.bcaa.edu.sg/what-we-offer/courses/certification-courses?CourseId=ef1d2bc2-3230-6ef1-b0a0-ff0200a28c6c
- E-permitting training—https://www.bcaa.edu.sg/what-we-offer/courses/short-courses-for-continuing-development?CourseId=8e8525c2-3230-6ef1-b0a0-ff0000a28c6c

Developing and Promoting Research

- Building resilience—https://www.bca.gov.sg/AboutUs/others/annual_report_18.pdf
- BCA's climate change study—https://www.bca.gov.sg/AboutUs/others/annual_report_18.pdf

3.2 Indonesia Centre for Housing and Settlement

The roots of PUSKIM date back to 1953, when the Institute for Building Problem Investigation was established. Under the Ministry of Public Works and Public Housing 2015 Ministerial Regulations, PUSKIM is a research center mandated to provide technical and research support for housing policy development.[36] PUSKIM's responsibilities include research and development through:

- Implementation of public works and public housing policy and regulatory development
- Policy review and development of infrastructure strategies
- Monitoring, evaluating, and reporting on research and development implementation

According to the organizational profile, PUSKIM is supported by approximately 82 researchers and 24 engineers, managed by approximately 37 structural officers as of 2015.[37] The 2017 Strategic Plan lists a total of 206 staff. Figure 2 presents the center's organogram.

PUSKIM also provides laboratory and field test services, including certification, inspection, calibration, and technical advice related to public works and housing construction[38] as part of its services, but does not appear to be specifically referenced in the ministerial regulations.

PUSKIM regularly meets and discusses building reliability with local governments to provide technical and policy-related recommendations[39] to improve the implementation of housing-related technologies. Furthermore, the Center collaborates with universities, other private and government research, and development organizations both in Indonesia and internationally to study resilience. Further examples of resilience-related activities related to guidance, outreach, and research are provided below.

[36] http://puskim.pu.go.id/wp-content/uploads/2014/07/reviu-renstra-2015-2019-Puskim.pdf
[37] http://puskim.pu.go.id/profil/sumber-daya-manusia/fungsional/
[38] http://puskim.pu.go.id/profil/tugas-dan-fungsi/; http://puskim.pu.go.id/profil/
[39] http://puskim.pu.go.id/kunjungan-kerja-dinas-pekerjaan-umum-dan-penataan-ruang-kabupaten-karanganyar-provinsi-jawa-tengah/

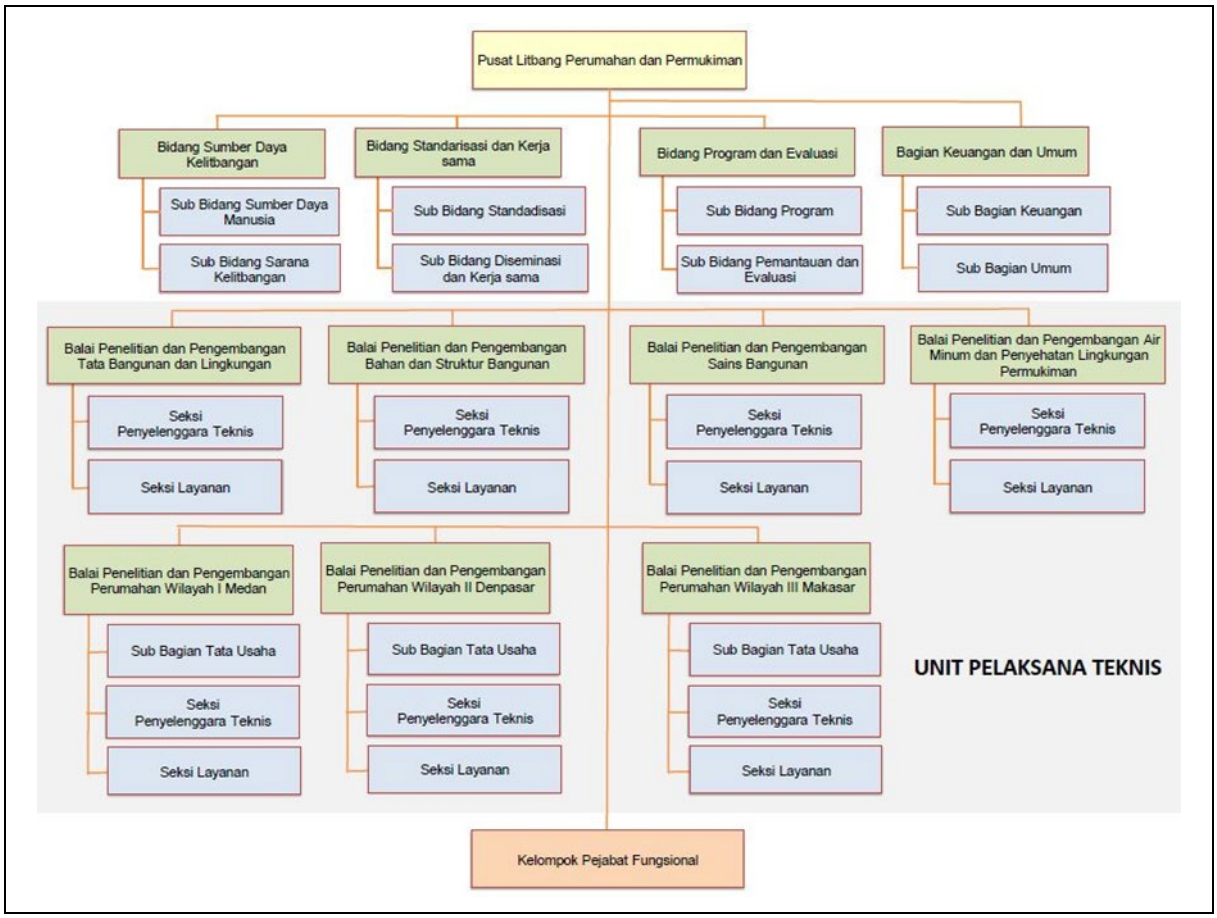


Figure 9. PUSKIM organogram divisions and subdivisions[40]

Regulatory Assistance

- Laboratory test protocols—http://puskim.pu.go.id/peta-dan-sumber-bahaya-gempa-indonesia-2017
- Construction cost analysis—http://puskim.pu.go.id/diseminasi-sosialisasi-standar-nasional-indonesia-sni-indonesia-tentang-analisa-biaya-konstruksi/
- Standards for building reliability—http://puskim.pu.go.id/diseminasi-dan-sosialisasi-standar-pedoman-dan-manual-spm-dengan-tema-melalui-penerapan-spm-kita-tingkatkan-kualitas-pembangunan-infrastruktur-semarang-14-maret-2012-dan-yogyak/
- Guidance
  - Practical Instructions for Earthquake Resistant Building Requirements—http://puskim.pu.go.id/category/informasi/perencanaan-rumah-tahan-gempa/
  - Procedures for building a simple earthquake resistant house on the 1/2 brick house construction—http://puskim.pu.go.id/tata-cara-membangun-rumah-sederhana-tahan-gempa-pada-konstruksi-bangunan-rumah-tembok-%c2%bd-bata/

[40] http://puskim.pu.go.id/profil/struktur-organisasi/

Communication and Outreach[41]

- Development and launch of technology information seminars
  - http://puskim.pu.go.id/diskusi-teknis-kajian-kehandalan-bangunan-rumah-tradisional-nias/
  - Economical, resilient housing—http://puskim.pu.go.id/kementerian-pu-tawarkan-konsep-rumah-tahan-gempa-dengan-harga-ekonomis/
- Trainings on GIS—http://puskim.pu.go.id/pelatihan-sistem-informasi-geografis/
- Publishing peer-reviewed articles—http://jurnalpermukiman.pu.go.id/index.php/JP
- Coordination and technology transfer to stakeholders (local governments, universities, ministries, NGOs, etc.)
  - http://puskim.pu.go.id/diskusi-teknis-kajian-kehandalan-bangunan-rumah-tradisional-nias/
  - http://puskim.pu.go.id/diskusi-teknis-kajian-kehandalan-bangunan-rumah-tradisional-nias/
  - http://puskim.pu.go.id/informasi/kerjasama/
  - http://puskim.pu.go.id/layanan/jenis-layanan/diseminasi/

Developing and Promoting Research

- Earthquake hazard maps—http://puskim.pu.go.id/peta-dan-sumber-bahaya-gempa-indonesia-2017/
- Earthquake design parameters for various soil conditions—http://www.teknika-ftiba.info/teknika/index.php/1234/article/view/68

3.3 Istanbul Seismic Risk Mitigation and Emergency Preparedness Project

ISMEP was initiated in 2006 as a World Bank-funded project to increase Istanbul's preparedness for earthquakes through three components[42]:

- **Institutional strengthening and emergency preparedness**, including construction of two control centers, development of a response plan, establishment of a seismic awareness training and outreach program, and design of a volunteer responder program
- **Improved building code enforcement** through a streamlined electronic permitting system implemented over 5–9 years and training for local civil engineers regulating buildings in seismically active areas[43]
- **Inventory, analysis, retrofit, and reconstruction of critical public facilities**, including 74 hospitals, 944 schools, and 1,175 other public buildings.

[41] http://jurnalpermukiman.pu.go.id/index.php/JP
[42] https://www.gfdrr.org/sites/default/files/publication/ISMEP%20CTBOOK_web%20version_v2.pdf
[43] http://www.451derece.com/451admin/uploads/file/yayin-isler/ismep_infografik_eng_02022017_v5.pdf

The project was implemented by a government coordination unit and overseen by the Under-Secretariat of Treasury. Figure 10 presents the organizational chart of the project.

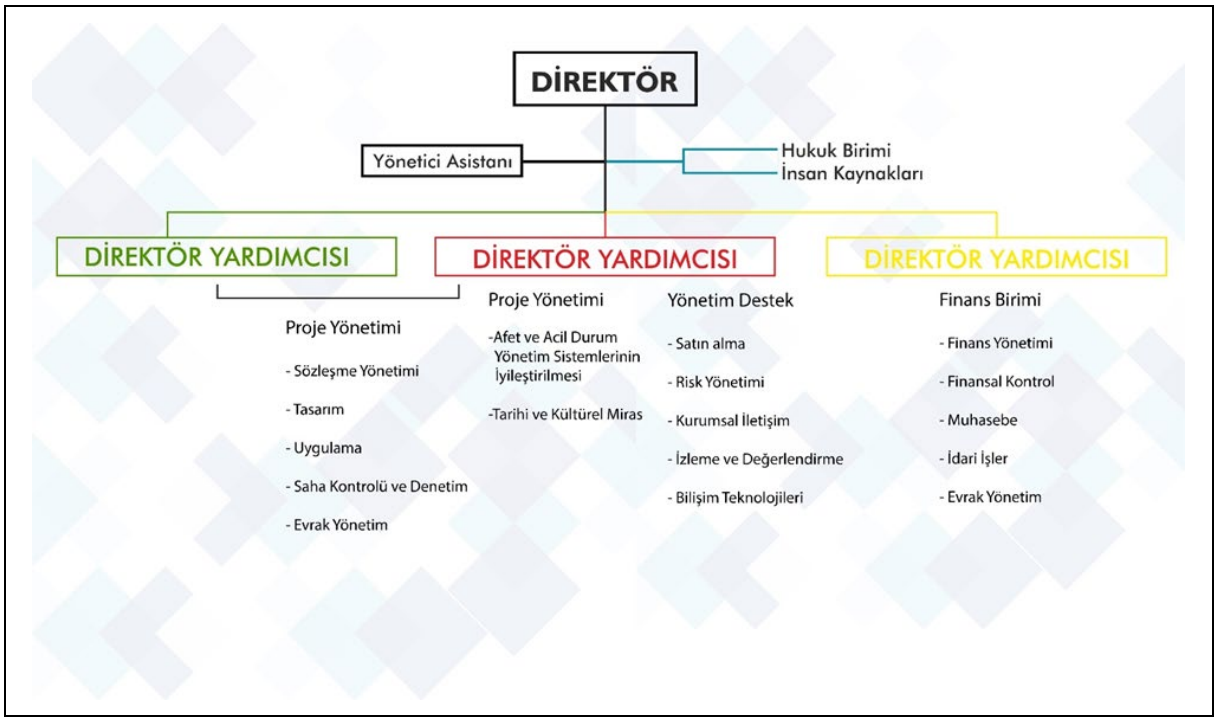


Figure 10. ISMEP Organizational Chart

Although the initial project investment was $300 million, a total of nearly $2 billion was provided by multiple international institutions throughout the 14-year project (including an additional $150 million by the World Bank in 2011).[44,45]

ISMEP credits the semi-autonomous platform with strong government buy-in and support from multiple ministries and agencies as a key factor in the success of the project.[46] Examples of resilience-related activities related to guidance, outreach and research are provided below.

Regulatory Assistance

- Transformed the building permit and building code enforcement process by implementation of ISO 27001 and an ECP system—http://www.worldbank.org/en/country/turkey/brief/the-istanbul-seismic-risk-mitigation-project
- Created an online archive and database to manage regulatory documents—https://www.ipkb.gov.tr/en/component/category/operating-the-process-of-building-license

[44] http://documents.worldbank.org/curated/en/694341536783793262/Turkey-Istanbul-Seismic-Risk-Mitigation-and-Emergency-Preparedness-Project European Investment Bank, Council of Europe Development Bank, the Islamic Development Bank and the Credit Institute of Germany are other donors.

[45] https://www.gfdrr.org/sites/default/files/publication/ISMEP%20CTBOOK_web%20version_v2.pdf

[46] http://documents.worldbank.org/curated/en/694341536783793262/Turkey-Istanbul-Seismic-Risk-Mitigation-and-Emergency-Preparedness-Project

- Trained engineers on regulations for buildings to be built in earthquake zones— http://www.ipkb.gov.tr/en/component/category/training-of-civil-engineers

Communication and Outreach

- Trained decision makers, technical staff, and community delegates on disaster risks and actions to be taken by the project— http://www.ipkb.gov.tr/en/component/category/informing-and-education-of-community
- Public workshops to solicit feedback and advice from various stakeholders and members of the public affected by reinforcement and rebuilding activities— http://www.ipkb.gov.tr/en/component/category/social-counselling
- Developed a Safe Life Training Program in-person trainings, an e-training module, and outreach materials. The project estimates that 826,552 people received awareness training as part of the program.
- Established emergency and communication information systems— http://www.ipkb.gov.tr/en/component/category/improving-emergency-management-systems

3.4 Pacific Earthquake Engineering Research Center

Headquartered at the University of California, Berkeley, PEER is a center for multidisciplinary earthquake engineering research and education, partnering with 15 universities and federal agencies.[47] PEER was established in 1997 through funding by the National Science Foundation and the State of California. Since then, it has expanded its funding sources to include universities, industry, utilities, and other state and federal agencies.

PEER involves key stakeholders and funding agencies in its programs through its Business and Industry Partner Program (BIP) and a variety of research and outreach programs.[48] Researchers and students from various universities participate in PEER-sponsored research and educational activities.

PEER's mission is to develop and disseminate technologies to support performance-based earthquake engineering. By providing quantitative tools for characterizing and managing these risks, performance-based earthquake engineering serves to address diverse economic and safety needs. PEER facilitates the development of seismic resilience guidance and codes provisions.[49.]

PEER has 11 laboratories that provide academic analyses as well as service to industry.[50] PEER has a major research contract with the California Earthquake Authority to conduct a multidisciplinary, multiyear research program to improve next generation attenuation models for active tectonic regions such as California. Figure 11 presents PEER's overarching research methodology and scope.

[47] https://www.nehrp.gov/pdf/SeismicWavesFeb08.pdf
[48] https://peer.berkeley.edu/about/faqs
[49] https://peer.berkeley.edu/about/mission-and-goals
[50] https://peer.berkeley.edu/laboratories

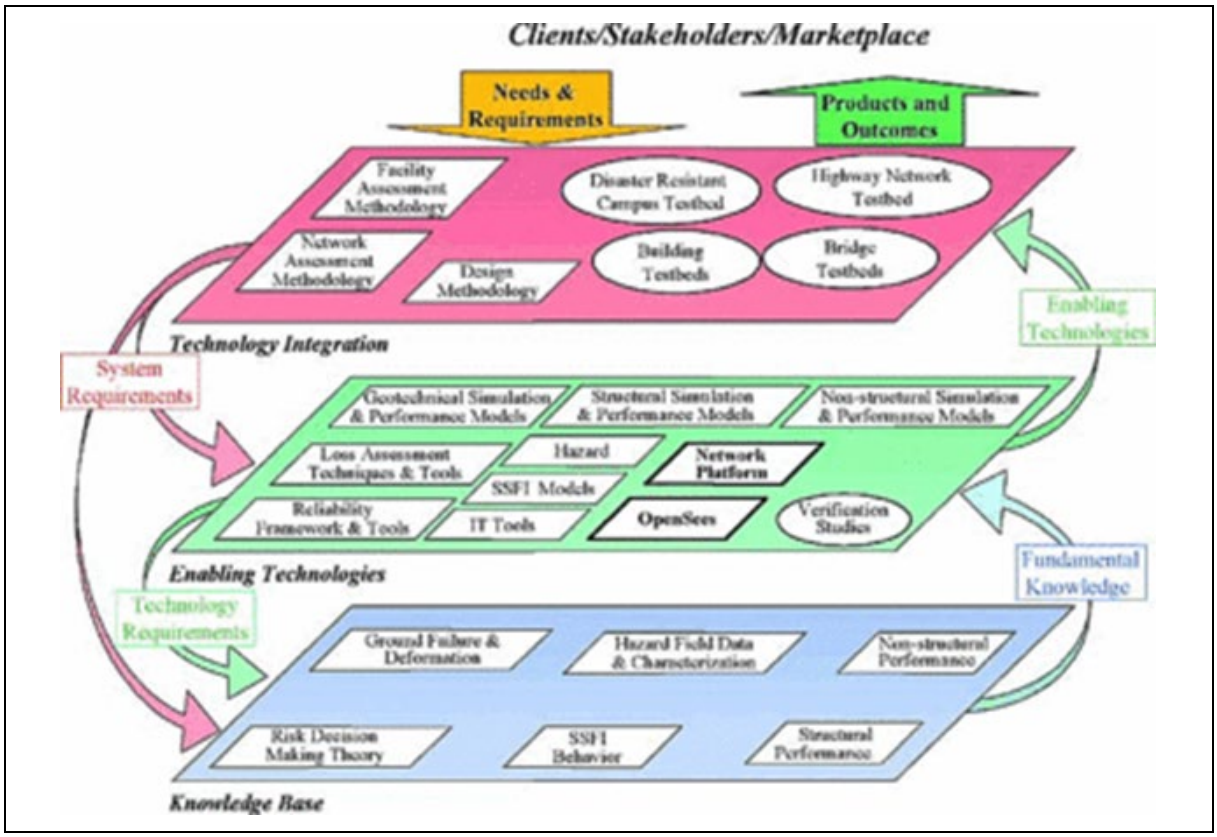


Figure 11. PEER Methodology[51]

Examples of resilience-related activities related to guidance, outreach. and research are provided below.

Communication and Outreach

- Public workshops to solicit feedback and advice from various stakeholders and prospective users of the attenuation models
- Dissemination campaign to ensure that the earthquake engineering community was aware of the resulting research findings—https://www.designsafe-ci.org/learning-center/training/simcenter/2018/webinar-181114/, https://www.designsafe-ci.org/learning-center/training/simcenter/2018/webinar-181106/
- Earthquake briefings—https://peer.berkeley.edu/earthquake-briefings

Developing and Promoting Research

PEER's research is focused around six core areas: Building systems, bridge and transportation systems, lifelines systems, earthquake hazard characteristics, social sciences and information technologies/data science. Outcomes and deliverables include:

- Guidelines for performance-based seismic design of tall buildings—https://peer.berkeley.edu/research/building-systems/tall-buildings-initiative
- Modeling and tools—https://peer.berkeley.edu/research/data-sciences

[51] https://peer.berkeley.edu/about/mission-and-goals

3.5 Earthquake Research Institute, University of Tokyo

ERI was established in 1925, two years after the 1923 Kanto earthquake. In 2010, ERI was designated as a nationwide Joint Usage/Research Center for Earthquake and Volcano Sciences by the Ministry of Education, Culture, Sports, Science and Technology. The mission of ERI is to promote research on earthquakes and volcanic eruptions and to develop methods for mitigating related disasters. ERI promotes comprehensive research and education in order to achieve two goals:

1. Scientifically unraveling the various phenomena within the earth and seismic/volcanic activities on our planet
2. Mitigation of disasters from such phenomena.

ERI has eight research centers and four laboratory groups, as well as a public outreach office. The institute promotes the international dissemination of its research by inviting researchers, post-docs, and professors to visit the institute for short-and long-term positions. The institute's organizational chart is provided in Figure 12.

Examples of resilience-related activities related to guidance, outreach and research are provided below.

Communication and Outreach

- Library and bulletin for public access
- Earthquake briefings—http://www.eri.u-tokyo.ac.jp/en/topics/

Developing and Promoting Research

- Seminars and visiting programs for researchers—http://www.eri.u-tokyo.ac.jp/en/seminar/, http://www.eri.u-tokyo.ac.jp/kokusai/english/visiting/apply_e.html
- Seismic data processing and statistics—http://www.eri.u-tokyo.ac.jp/en/projects/
- Earthquake imaging techniques—https://www.muographix.u-tokyo.ac.jp/

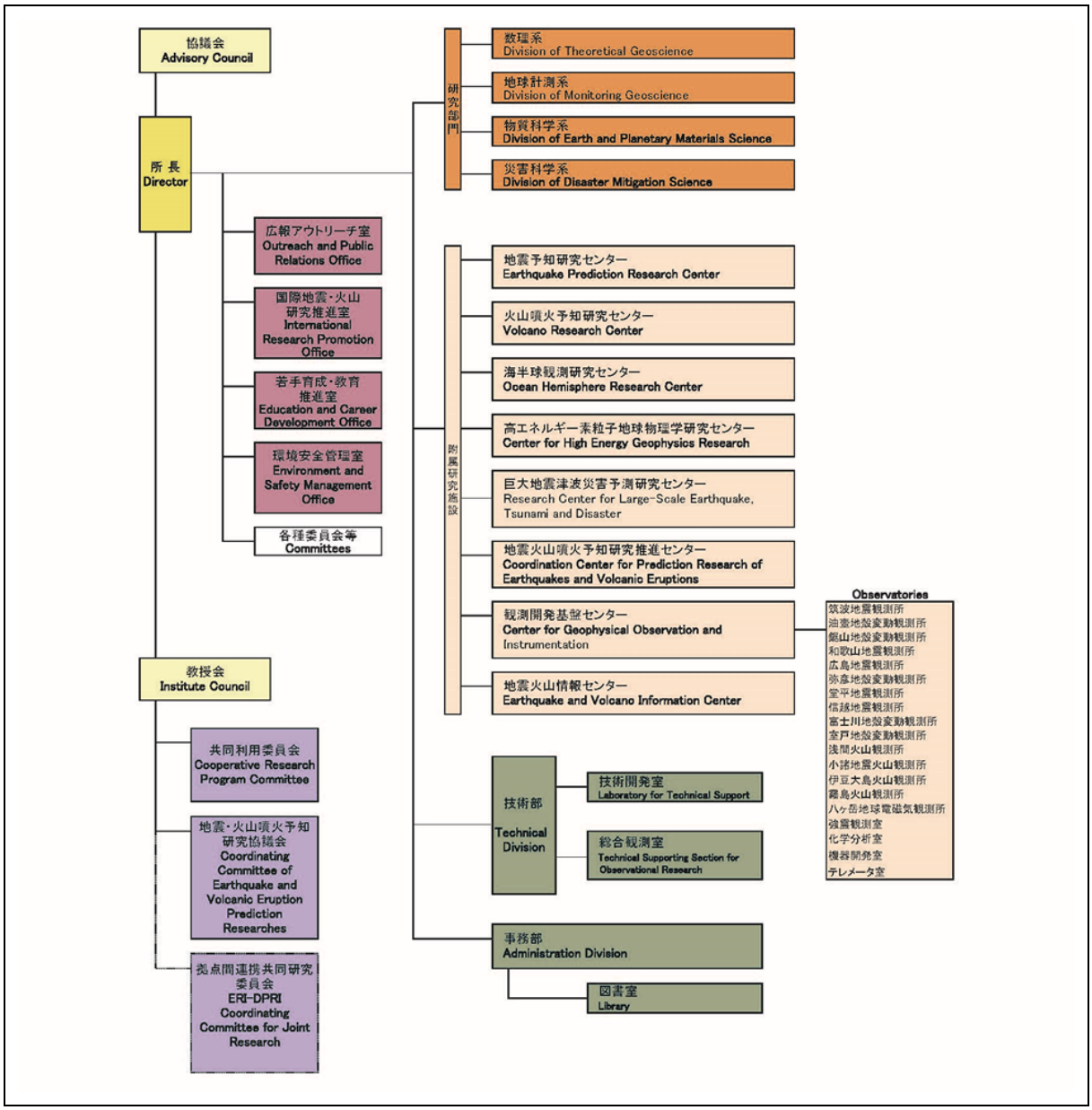


Figure 12. ERI Organizational Chart[52]

3.6 National Society for Earthquake Technology

Nepal's NSET was initiated by professionals and founded as a Ministry of Housing and Physical Planning working group in 1993 with the vision of developing "Earthquake Safe Communities in Nepal by 2020" through earthquake engineering research. NSET has three strategic objectives: information dissemination and knowledge transfer, advocacy and networking, and establishment of credible

[52] http://www.eri.u-tokyo.ac.jp/en/overview/organizational-chart/.

institution and resource center.[53] NSET also provides emergency assistance to communities impacted by earthquakes. NSET has 223 full time staff as of 2016. NSET also accepts and hosts volunteers and interns to the areas of its work[54] as part of their education and outreach.

Regulatory Assistance

- Assistance to communities to implement building codes— http://www.nset.org.np/nset2012/index.php/successstory/successstoryview/successstoryid-2
- Emergency response plans— http://www.nset.org.np/nset2012/index.php/successstory/successstoryview/successstoryid-3

Communication and Outreach:

- Technical assistance and support to communities and developers— http://www.nset.org.np/eq2015/nset_effort.php , http://www.nset.org.np/nset2012/index.php/successstory/successstoryview/successstoryid-1
- Earthquake briefings and response—http://www.nset.org.np/eq2015/nset_effort.php
- Preparation materials—http://www.nset.org.np/nset2012/index.php/menus/menuid-62/submenuid-90

Developing and Promoting Research

- Situation maps—http://www.nset.org.np/eq2015/nset_effort.php#development

[53] http://www.nset.org.np/nset2012/index.php/menus/menuid-57/submenuid-131

[54] http://www.nset.org.np/nset2012/index.php/menus/subsubmenudetail/submenuid-141/subsubmenuid-78/menuid-57

4 Recommendations for URU and Feasibility

4.1 Overall Vision

The URU's vision has been described previously as "increasing Urban Resiliency in the Dhaka region by mainstreaming Disaster Risk Management (DRM) into its operations, functions, planning, policy and decision-making."[55]

As thinking continues to progress and the vision of the URU becomes clearer, we will work with RAJUK/URU to further articulate the URU vision. A revised vision statement could be:

> *To transform Dhaka to a Sustainable and Resilient City by Mainstreaming Disaster Risk Management (DRM) into its Planning, Policy, Decision-Making, Functions, Operations and Implementation by 2030.*

An example mission statement for the URU might be articulated as:

> *The URU will provide the physical infrastructure and human capital to strengthen the capacity of the Risk Assessment Technique, Risk Management Technique & Risk Communication Technique in Dhaka.*

This vision and mission make clear that the URU must be a highly technical body that can serve as a resource for other governmental, private sector, and academic organizations important to an effective and comprehensive DRM program. The URU also must be in a position to influence planning, policy, and decision making important to DRM.

4.2 Formation Options for URU

There is no one right answer for formation of an organization to promote urban resiliency. Other countries looking to establish an organization similar to the URU have arrived at different solutions. And there are examples in Bangladesh itself that may provide viable models for the URU's formation. Therefore, this report provides several options for how the URU can be constituted. In addition to describing the options, this report includes relevant information that decision makers may find instructive as they debate which option will best accomplish the URU's vision and mission.

When determining *where the URU should be placed* relative to existing government structures, it is also necessary to decide *what the essence of the URU will be*.

- Will it be a **scientific research and development institution** that influences policy and opinions on resiliency, creates tools and systems for use by other departments of RAJUK, provides training for RAJUK staff and others, and builds demand for resilient construction through public awareness? This may be considered a design, build, test, train, and transfer model of operation (like a "Think Tank").
- Will it **also be a service delivery organization** that implements the systems and approaches it develops rather than transferring them to other departments of RAJUK to operate?

[55] See Annex A, p.3.

Two options are shown for the nature of the organization and five options are presented below for the positioning choice both within RAJUK and outside. We also present a brief analysis of the various options against seven basic evaluation criteria:

1. Elaboration of the **basic pros and cons** of each option.
2. An estimate of the **political capital** needed to achieve each option, recognizing that each option risks a perception of "winners" and "losers." Political support is therefore important.
3. Potential **cost** of each option.
4. The likely **influence** that the URU will be able to exert towards the mainstreaming of resiliency in each option.
5. The likely **impact** on the achievement of the URU's resiliency goals of each option.
6. The **time** each option will take to achieve.
7. The **readiness** of RAJUK to implement each of the options.

These options will form the basis for discussion at anticipated focus groups and meetings with key decision makers in February 2019.

There are pros and cons for both structure/function and position options. It is important to consider the development timetable for the institutionalization of the URU beyond the lifecycle of the current URP, as well as revenue streams for the future. Given the urgency of delivering the initial set up objectives by June 2020, the selection of the appropriate function and structure must be pragmatic and achievable within the given timeframe. RAJUK readiness to deliver is, therefore, a critical consideration and has been included in the evaluation of each option. Assuming that further phases of development are implemented, in line with the long-term development horizon discussed below, the possibility of design thinking evolving further in the future is a possibility.

4.2.1 Functional Options for the URU

Option F1: Think Tank

Summary: The URU as a scientific research and development institution that influences policy and opinions on resiliency, creates tools and systems for use by other departments of RAJUK, provides training for RAJUK staff and others, and builds demand for resilient construction through public awareness.

Figure 13 presents the proposed organizational structure.

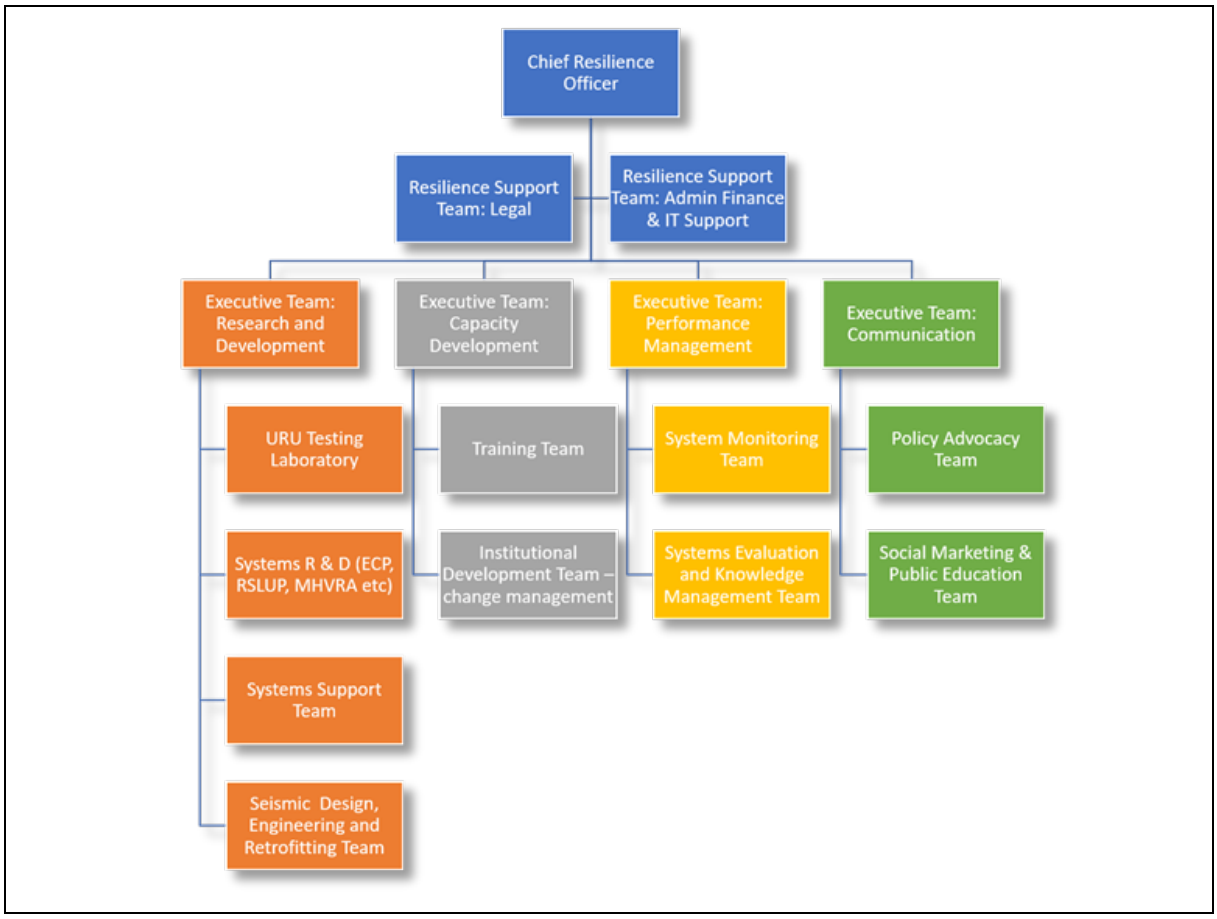


Figure 13. Option F1 Proposed Organizational Structure

Criteria	Analysis
1. Pros	Provides the possibility of high-quality technical assistance for organizational change and development in a relatively small (< 450 people) team. Does not duplicate functions/responsibilities of existing RAJUK departments, but assists them, reducing risk of political in-fighting. Less distracted by the operational challenges of service implementation. Could be adapted in future phases to manage service delivery if think tank only model does not work well enough.
2. Cons	Requires strong political support and authority to have new systems and other innovations adopted wholeheartedly by other departments. Does not cleave as closely as it might to the PIU vision, problem of research uptake.
3. Political capital	Less political capital required to establish this model as it is not duplicating the work of other existing departments.
4. Likely cost	Likely to be cheaper to operate than the currently envisaged budget of the URU as it can be significantly smaller.
5. Influence	With Chairman's authority behind it and lack of functional duplication, it could be highly influential. The URU's communications function would, though, have to work very effectively to sell its products and its research and development team would need to be highly client oriented.
6. Impact	This is a cost-effective model for delivering the impact of increased urban resilience by helping RAJUK perform to its full potential in permitting, inspection, risk sensitivity, etc.
7. Time	Immediate establishment as a support unit for organizational change under the authority of the RAJUK Chairman.
8. Readiness	PIU is already in place to play this role. Further recruitment and training would be required but is already funded by the current project.

Option F2: Think Tank + Service Delivery Unit

Summary: URU as **BOTH** a scientific research and development **AND** a service delivery organization that implements the systems and approaches it develops rather than transferring them to other departments of RAJUK to operate. Figure 14 presents the proposed organizational structure.

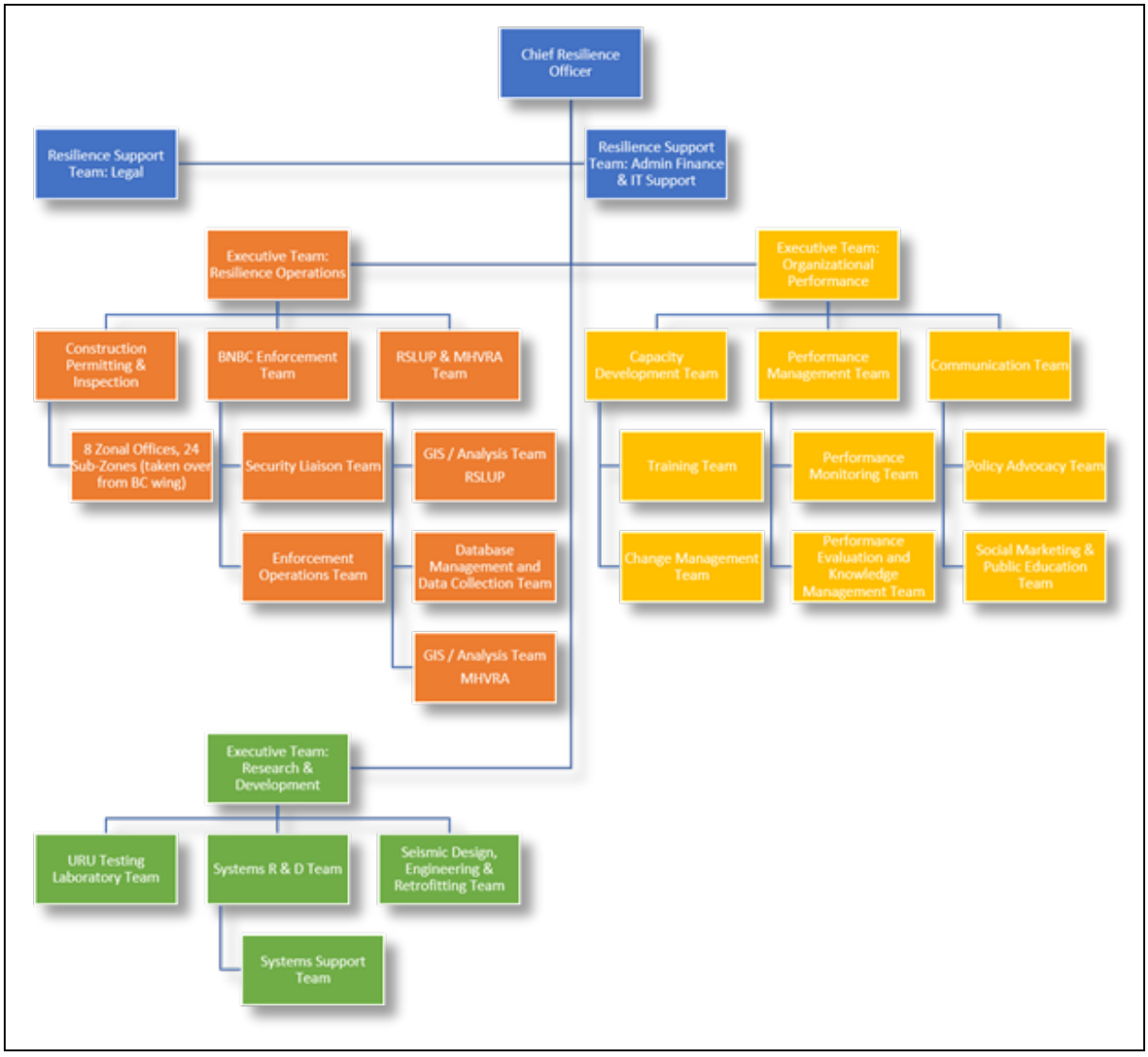


Figure 14. Option F2 Proposed Organizational Structure

Criteria	Analysis
1. Pros	R & D + service delivery may produce faster impacts on the ground, streamlined management structure. R & D + service delivery may help momentum and sustainability.
2. Cons	Requires removal of responsibilities from existing departments to avoid duplication of effort and client confusion. Increased likelihood of political in-fighting. Relocating functional responsibilities from existing departments to the URU without addressing underlying performance challenges risks undermining the URU's performance.
3. Political capital	Likely greater investment of political capital needed as it implies a removal of responsibility from existing departments, particularly Development Control and Planning. It may be possible to move from the option F1 to the option F2 structure over time if circumstances and performance justify it.
4. Likely cost	Higher cost than currently anticipated URU budget. Why? Operational staff for functions like construction inspection and permitting are likely underestimated in the DPP vision for URU (460 staff). Currently Development Control has a notional staff size of 1,040. Staff in zonal offices complain of being seriously understaffed. The +/- 200 proposed is therefore unlikely to be enough to do the job.
5. Influence	Combining the think tank and delivery roles is likely to enhance the influence of the URU over directly managed services (currently envisaged as ECP and inspection, RSLUP, and potentially MHVRA). Depending on the way organizational change is managed in changing the roles and responsibilities of Development Control and Planning departments (at least) this could cause resistance.
6. Impact	Possibility of achieving desired impact assuming current underlying challenges facing Development Control and Planning are resolved and not simply transferred to URU.
7. Time	This option would take longer to establish and materialize than option F1 due to the bigger scale and organizational change requirements mentioned above.
8. Readiness	This would be a complex and politically challenging option to implement at the start of the project. Executive decisions on changing the roles and responsibilities of the Development Control and Planning departments would be needed. Recruitment or transfer of adequate staff to run a service like construction inspection and permitting would take time and risk legal jeopardy should existing staff be released. This is a possible long-term option but should not be the starting point for the URU.

A two-step institutional development process is possible. Firstly, implement option F1 (think tank only) to develop and transfer improved systems and capacity to other RAJUK departments. If, after a specified period, those departments (Planning, Development Control) are not able to achieve improved urban resilience, transfer implementation responsibilities to the URU management as a new, or replacement, department.

4.2.2 Structural Options for the URU

Option S1: Separate Urban Resiliency Institute Created within RAJUK

Figure 15 presents the proposed organizational structure under Option S1.

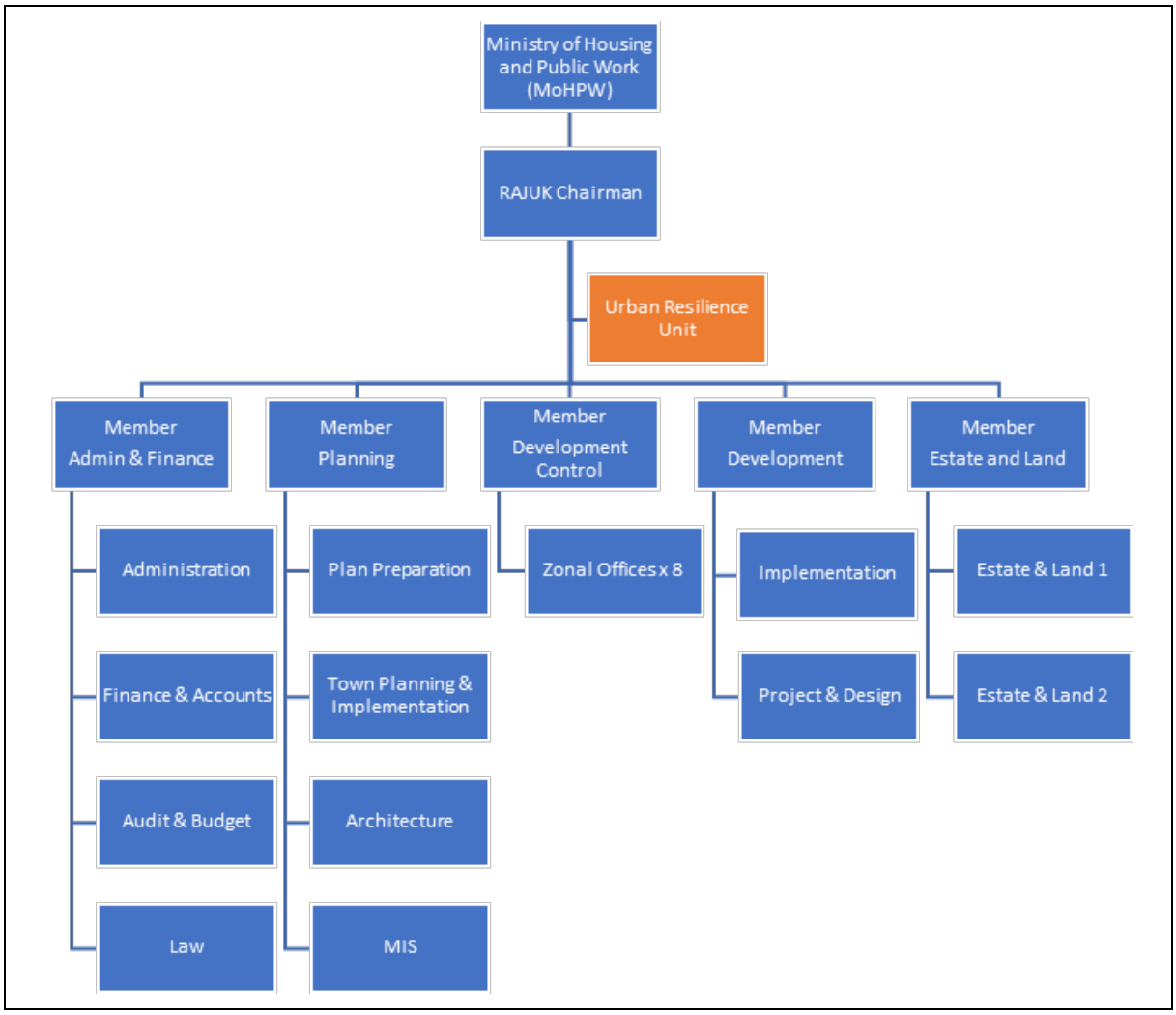


Figure 15. Option S1 Proposed Organizational Structure.

In this scenario, the URU is an independent body within RAJUK that is separate from the departments and reports directly to the Chairman. It will embody the vision and mission by being a highly technical body that can serve as a DRM resource for other governmental, private sector, and academic organizations. Being independently located within RAJUK and reporting directly to the Chairman, and with his direct authority, puts it in a position to influence planning, policy, and decision making across the RAJUK organization. This position also greatly assists with research and systems uptake.

Possible names for this organization:

- Urban Resiliency Institute (URI)
- Center for Research and Development for Urban Resiliency (CREDUR)

Good practice examples in Bangladesh are FFWC, WARPO and FPMU.

The Government and RAJUK itself have the authority to make any rules that they deem fit and necessary for carrying out the purposes and objectives of the Town Improvement Act. Creating an Urban Resiliency Institute falls within that power. RAJUK presumably will draft such a rule and send it to the Ministry of Housing and Public Works for approval. This rule will next be sent to the Division of Legislative and Parliamentary Affairs, Ministry of Law Justice and Parliamentary Affairs for vetting and approval, and once approved, the proposed regulation will be adopted.

Criteria	Analysis
1. Pros	Authority of Chairman; supportive not competitive link to RAJUK departments. Focus on R & D for service improvement without distraction of service delivery. Respects integrity of current organigram thereby minimizing complex organizational changes.
2. Cons	Without **service delivery responsibilities** it would depend on its ability to influence behavior of other departments and sustained support and authority from successive chairs to achieve long-term impact.
3. Political capital	Assuming the **support of a reforming Chairman**, this is likely to be the option that would be most immediately acceptable to stakeholders within and outside of RAJUK. Would not need amendment of the 1952 Town Improvement Act to establish.
4. Likely cost	To be determined
5. Influence	Acting as a R&D/organizational change support office with the authority of the Chairman, the URU would be well placed to interact with all departments within RAJUK, the wider government and other external stakeholders. Some good practice examples in Bangladesh are FFWC, WARPO, and FPMU.
6. Impact	With a focus on the design, build, test, training, and transfer of new systems to end users in other departments, the URU would be able to provide specialized technical assistance to improve performance of the whole organization and workforce with a reduced risk of institutional resistance to change.
7. Time	Without the need for immediate changes to the law, the URU could be established in this position relatively quickly.
8. Readiness	This is the most straightforward organizational solution for the establishment of the URU for which RAJUK readiness and capacity is high. This option requires the minimum change to the organogram.

Option S2: Urban Resiliency Department Created as Sixth Department of RAJUK

Figure 16 presents the proposed organizational structure under Option S2.

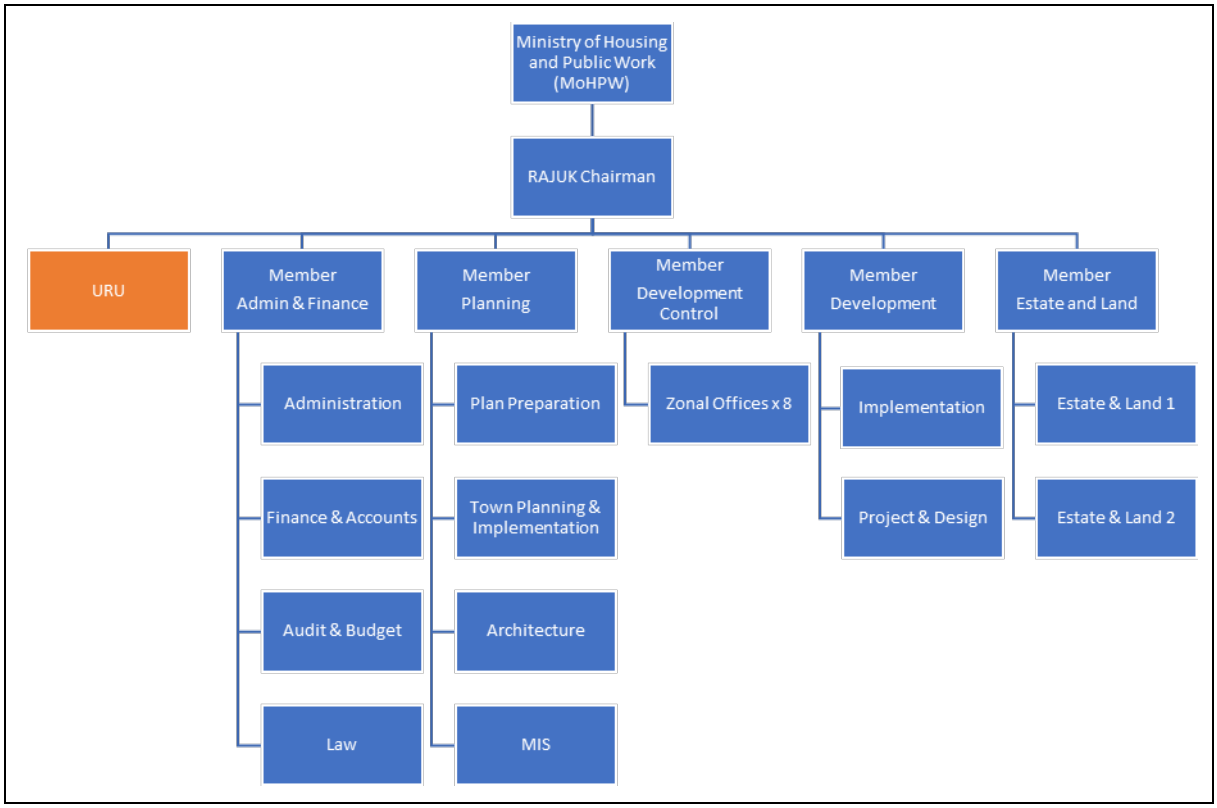


Figure 16. Option S2 Proposed Organizational Structure.

In this scenario, the URU will be constituted as a sixth department of RAJUK equal in stature to the other RAJUK departments. The URU will be headed either by a member or other designated position that reports directly to the Chairman. Examples of this formation structure exist in the form of the five currently existing RAJUK departments.

The government has wide power to make any rules that it deems fit and necessary for carrying out the purposes and objectives of the Town Improvement Act. The only impediment on such wide power of the government is that such Rules cannot be inconsistent with the Act itself. The Act does not prescribe the organization of RAJUK itself, except to say that it will be made up of a Chairman and *not more than five* members.

To create the department itself seems to fall within the government's rule-making power and creating a department to handle urban resiliency functions is quite defensible and justified. However, the sixth department can only be headed by a member if Parliament changes the Act to allow for more than five members.

If the position for head of the Urban Resiliency Department carries a salary above the approved government pay scale, the government must approve it. And the approved budget must accommodate staffing for the department.

Criteria	Content
1. Pros	• Equal political weight to other departments of RAJUK. • Implies adopting a service delivery role in addition to R&D, which may be efficient for implementation of new systems.
2. Cons	• Would require changes to the Town Improvement Act 1952 to be sustainable, which would consume a lot of time *if* the new department is to be led by a member. • Implies removal of responsibilities from other departments, which may be resisted. • If the new department is not led by a member, it may cause influence challenges with other departments. • Cross-departmental (horizontal) collaboration is difficult to mainstream.
3. Political capital	• Amendment of the 1952 Town Improvement Act would require the use of a lot of political capital, be time consuming, and difficult to argue for while the URU remains an unproven idea rather than a proven innovation that delivers results. This could be a longer-term option. Amendment of the law is likely not necessary if URU not headed by a Member.
4. Likely cost	• To be determined
5. Influence	• URU would have equal status with other departments and participate in senior management / policy dialogues as such. This would give it a platform to influence the other departments.
6. Impact	• Impact likely to be more focused on the areas of direct responsibility under the URU as horizontal mainstreaming may be difficult to achieve.
7. Time	• Immediate establishment, but potentially very lengthy process for formal, gazetted approval and sustainability if desired to be led by a Member.
8. Readiness	• RAJUK may be able to implement this quickly, but it would take a significant time to have the arrangement gazetted and made permanent if desired to be led by a Member.

Option S3: Urban Resiliency Section under Development Control Department

Figure 17 presents the proposed organizational structure under Option S3.

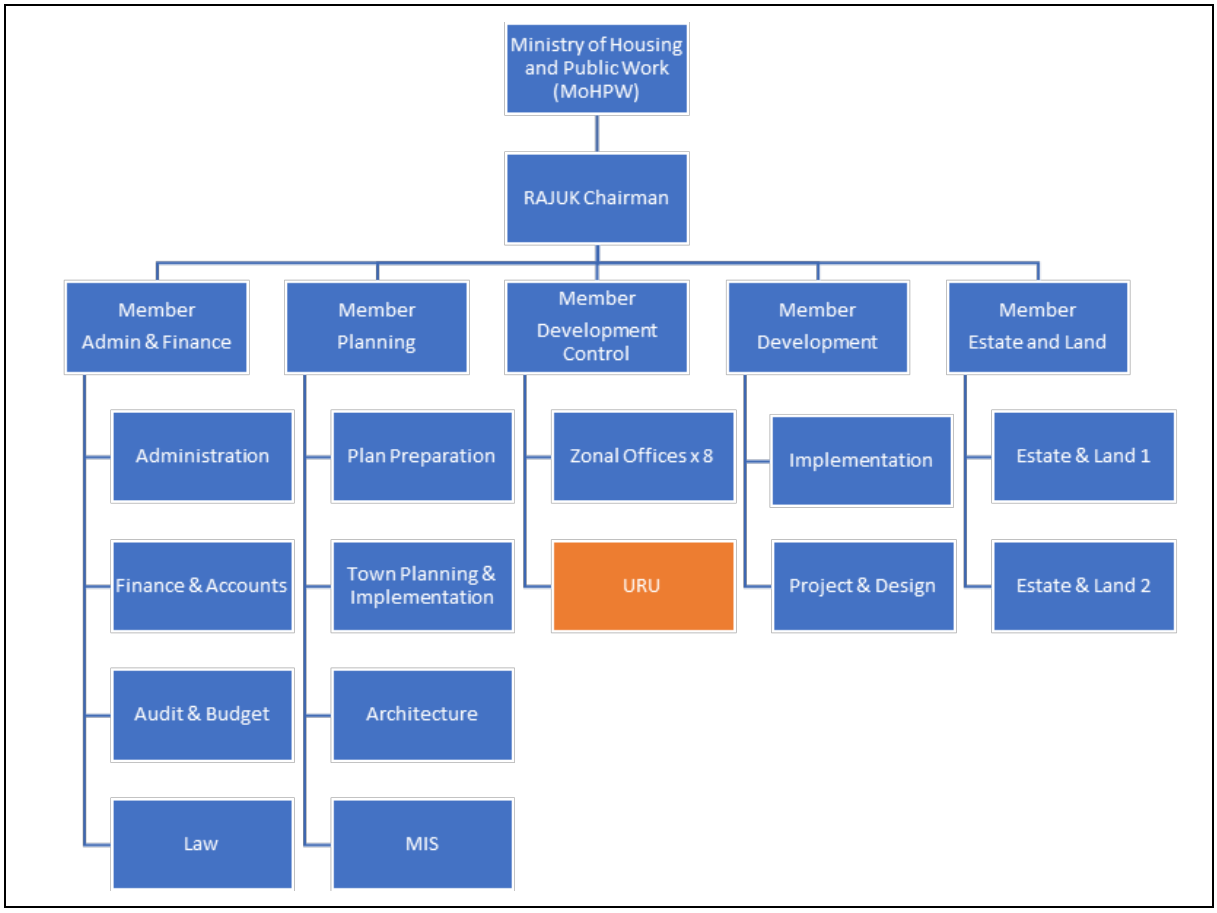


Figure 17. Option S3 Proposed Organizational Chart.

Under this option, the URU will become the Urban Resiliency section under the Development Control Department.

The government and RAJUK itself have the authority to make any rules that they deem fit and necessary for carrying out the purposes and objectives of the Act. Creating an Urban Resiliency Institute falls within that power. RAJUK presumably will draft such a rule and send it to the Ministry of Housing and Public Works for approval. This rule will next be sent to the Division of Legislative and Parliamentary Affairs, Ministry of Law Justice and Parliamentary Affairs for vetting and approval, and once being approved, the proposed regulation will be adopted.

Criteria	Content
1. Pros	Nested within an existing management structure, less likely to create resistance.
2. Cons	Horizontal collaboration potential reduced, authority to propose and push through organizational change reduced. Unlikely to be enthusiastically supported by the World Bank.
3. Political capital	Likely easy to establish under the authority of an existing department although there may be some competition among departments over the placement decision.
4. Likely cost	To be determined
5. Influence	Likely that the URU would have reduced influence across the organization as it would be merely a section of a department and, as such, would lack authority. In this model the URU would be oriented more toward the design, build, own, operate approach.
6. Impact	Likely to have reduced impact on mainstreaming urban resilience, although it may be able to operate services like ECP somewhat more efficiently/effectively than current arrangements allow.
7. Time	Immediate, but may take considerable time to achieve a sustainable status within the GoB system.
8. Readiness	Could be implemented quickly, but unlikely to be supported by the URU and World Bank due the potential for limited influence across departments.

Option S4: URU as a Semi-Autonomous Body under the Trust Act

Figure 18 presents the proposed organizational chart under Option S4.

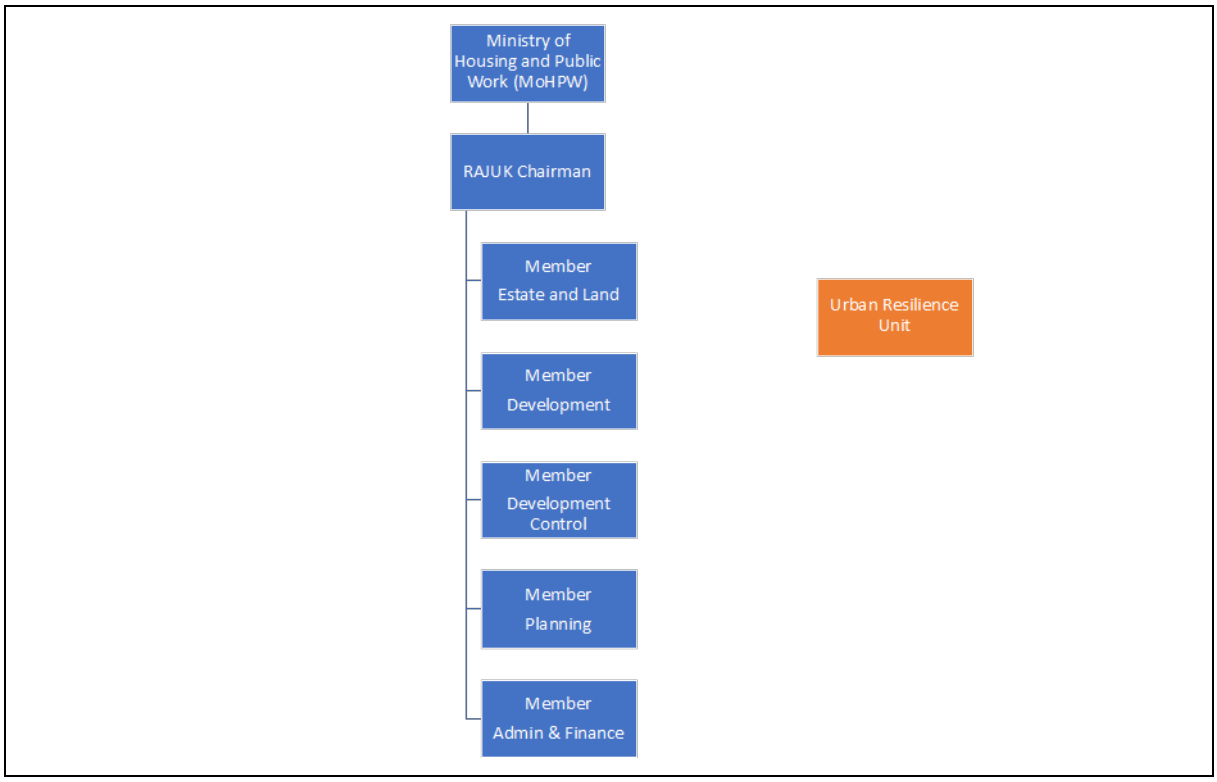


Figure 18. Option S4 Proposed Organizational Chart.

The URU could be established a Public Trust under the Trusts Act. The URU would become a self-financed, not-for-profit, government-owned organization. Alternatively, RAJUK may opt to contract out the functions of the URU to an existing public or private sector organization with existing capacity in resilience, systems development, training, and public education.

This option is modeled on Bangladesh's Center for Environmental and Geographic Information Services (CEGIS, http://cegisbd.com/), which is a science-based independent organization. It began as a series of donor-funded projects and later was established as an independent organization. CEGIS describes its establishment as follows:

> ***History***
>
> *Following the disastrous floods of 1987 and 1988, the GoB undertook a comprehensive review of the flood policy and flood protection management in the country. The floods had attracted international interests in helping Bangladesh to face such natural disasters. With the aid of foreign agencies, a Flood Action Plan (FAP) was drawn by the GoB. FAP was an initiative to study the causes and nature of floods in Bangladesh and to prepare guidelines for controlling it. It was based on several earlier studies by the UNDP along with a French Engineering consortium, the USAID and JICA. The World Bank coordinated the preparation of FAP.*

FAP had 26 Components (FAP-1 to FAP-26). FAP-16 was a collection of environmental studies and activities and FAP-19 was concerned with the Geographic Information System (GIS). These two – FAP 16 and 19 - were supported by the USAID during the period 1991-1995. In 1995, the project 'Environmental and Geographic Information System Support Project for Water Sector Planning (EGIS)' was launched by combining FAP-16 and FAP-19. Phase I of EGIS (EGIS I) started in 1996 and ended in 1997 and was funded by the GoB and the Government of the Netherlands (GoN). On recommendations of a Joint Mission of the two governments (GoB and GoN), Phase II (EGIS II) of the project was started in 1997 and was ended in 2002.

With a view to developing national capacity for the betterment of the country and to continuing the successful efforts that EGIS had achieved by then, the GoB established CEGIS as a Public Trust on 16 May 2002 under the Trusts Act of 1882. Since then, CEGIS has been working as a self-financed not-for-profit government owned organisation to fulfill its mission under the Ministry of Water Resources of the GoB.[56]

Another example is the IWM.

Criteria	Content
1. Pros	Positions URU as a semi-autonomous institution that is potentially insulated from some negative pressures and risk of elite capture. May increase the potential to mainstream urban resilience more broadly across government systems, and society, some successful good practice models in Bangladesh (e.g., CEGIS, IWM)
2. Cons	No chance of being successful at the outset of the URP.
3. Political capital	High political capital consumption and long-term support needed for this option. This option may be viable after the URU is fully established, delivering outstanding results, and with a case for support.
4. Likely cost	Potentially higher than establishment within the GoB, but self-financing options are more diverse through bidding on development-funded and commercial contract opportunities.
5. Influence	Offers an opportunity to mainstream concepts, policies and practices for urban resilience more broadly than an institution embedded within government. However, independence also removes some of the authority the URU may have from being inside the GoB.
6. Impact	Since this is a long-term scenario it would only occur on the assumption that the first phases of the URU, within the GoB, had delivered outstanding impact and value.
7. Time	10+ years.
8. Readiness	This option will require significant political support and time based on a proven track record and solid evaluation of options to move the URU outside of government.

56 http://www.cegisbd.com/GenInfo

Option S5: URU as a Separate Institution under MoHPW

Figure 19 presents the proposed organizational chart under Option S5.

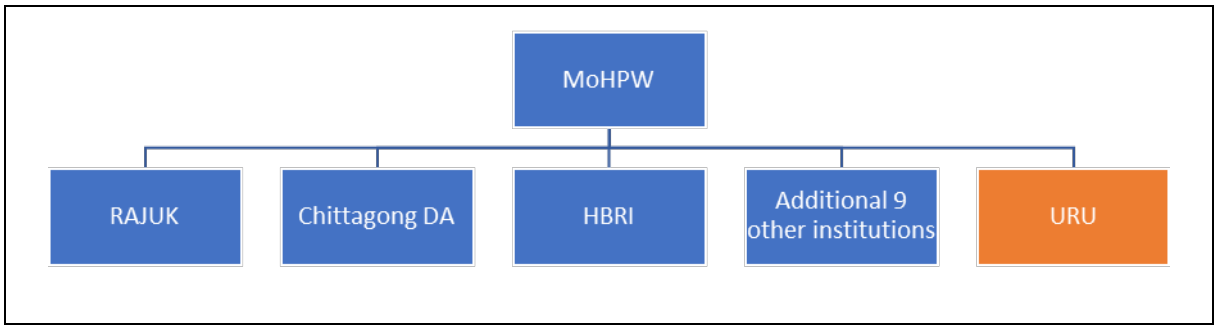


Figure 19. S5 Proposed Organizational Chart.

Under this option, the URU will be a separate institution under the Ministry of Housing and Public Works. It will be equivalent to, but separate from, RAJUK.

Several of the best practice organizations discussed earlier in this report are formed based on this model, although they have very different functions. For example, Singapore's Building and Construction Authority is a separate agency under the Ministry of National Development that does both research and development and service delivery. The BCA exercises building control, operates the EPS and coordinates the one-stop-shop, drafts regulations, conducts outreach to industry and the community, promotes research, and has an academy. In contrast, PUSKIM in Indonesia is a research center mandated to provide technical and research support for housing policy development. PUSKIM's responsibilities include research and development.

These examples show that the positioning of the organization can be distinct from its function.

Criteria	Content
1. Pros	Potentially enhanced authority and independence to develop and apply the urban resilience portfolio more broadly than as a sub-unit of RAJUK.
2. Cons	No guarantee that this status would be effective in influencing the practices of other institutions Risk of political in-fighting between competing institutions of MoHPW is high. This option would require significant changes to the legal framework of MoHPW, which would take a long time and only be justified by the outstanding potential of the URU being proven.
3. Political capital	High political capital consumption and long-term support needed for this option. This may be a long-term consideration for the URU, but is not a realistic starting point.
4. Likely cost	To be determined.
5. Influence	Potentially significant, assuming the institution is adequately staffed and resourced over the long term. There are other institutions of the MoHPW that have not achieved significant influence, so this organizational solution is by no means a guarantee of success.

6. Impact	Potentially significant assuming it has the authority and competence to facilitate organizational change within other MoHPW institutions, specifically RAJUK and the other urban development authorities.
7. Time	10+ years.
8. Readiness	This option will require significant political support and time based on a proven track record and solid evaluation of options to move the URU outside of government.

4.3 Importance of a Long-Term Development Horizon

The URU will take time to fully develop, certainly beyond the 18 months of the current project. It is important to remember that organizational design/placement options that are not feasible at the beginning of the project may be viable as the concept matures, delivers results and generates support and buy in. Figure 20 presents a long-term strategy for developing a sustainable URU.

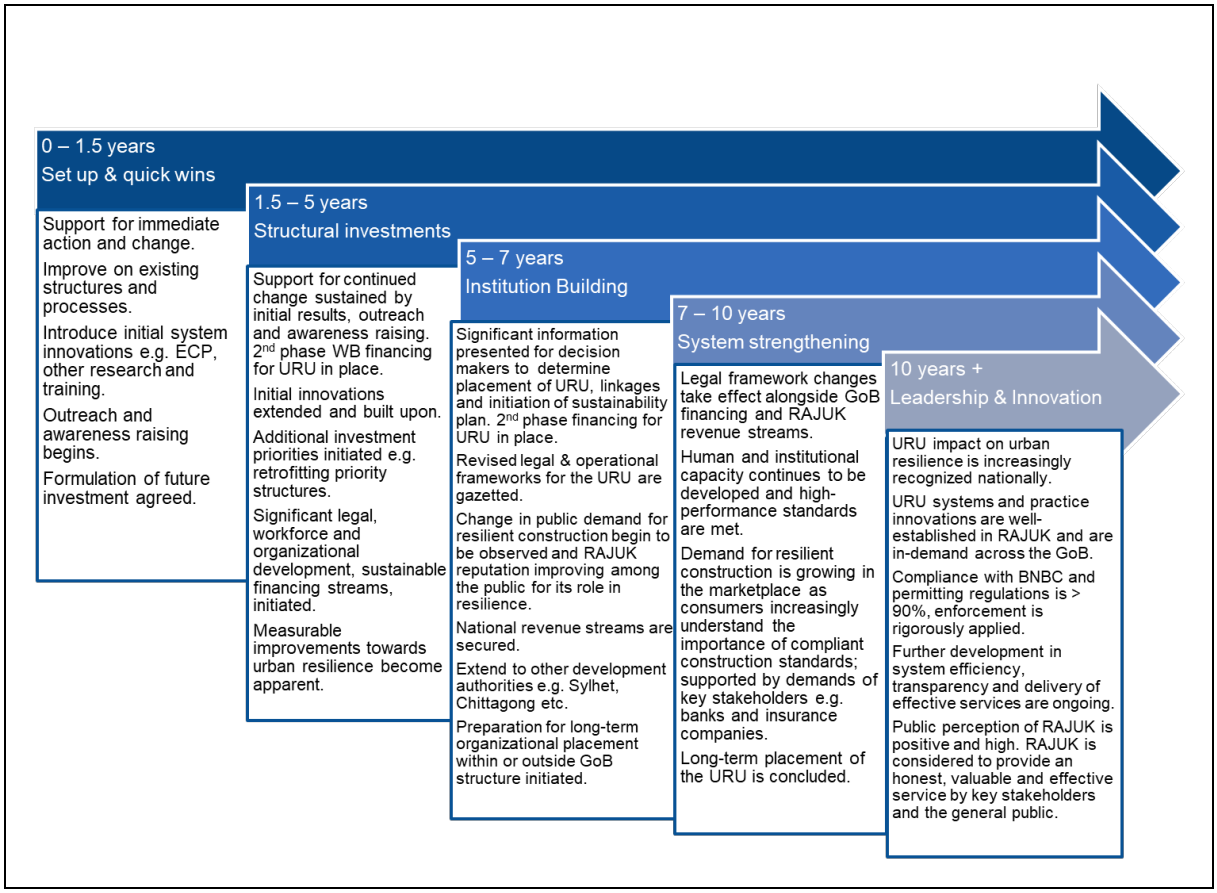


Figure 20. Long-term development horizon

4.4 URU Future Revenue Streams

Achievement of the long-term development horizon implies a period of ongoing, externally funded support in the form of grants and loans. At the same time, national sources of revenue will be developed and applied (Figure 21).

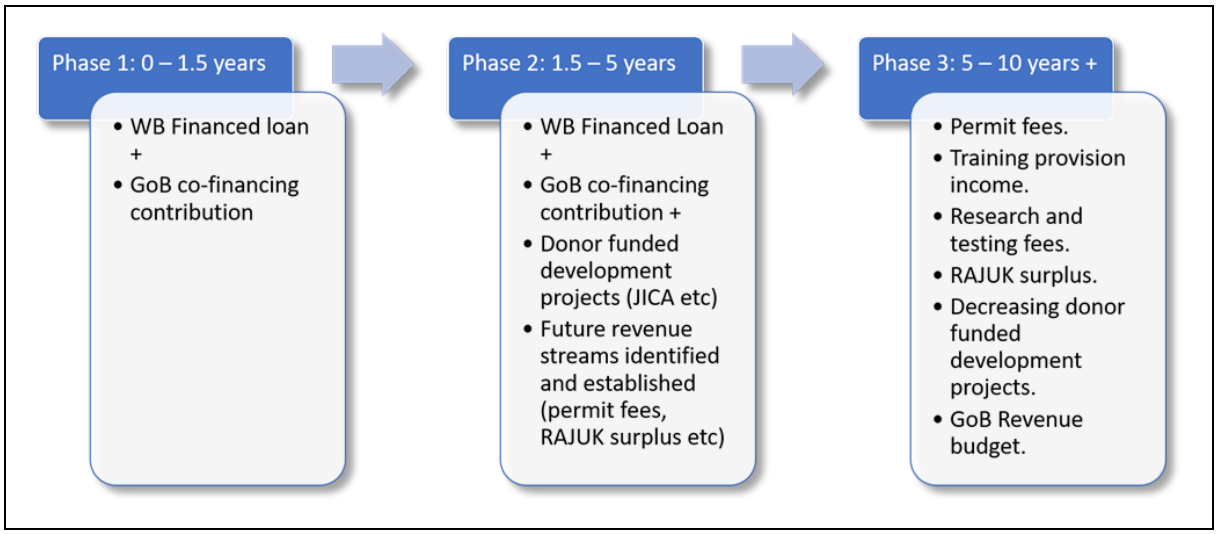


Figure 21. Phased Approach to Revenue Stream Development

4.5 Recommended Organogram of the URU/URD

4.5.1 Roles and Requirements of Each URU Division/Department in URU Option F1: Think Tank

Manpower requirements and projections

- Estimated full-time staff members are **120**. Staffing would comprise:
  - 7 executive level (1 x Chief Resilience Officer [CRO]), 2 x Deputy CRO (Operations and Support), 4 x Executive team leaders.
  - 5 executive team support staff (1 for CRO + DCROs, 1 each for 4 executive teams)
  - R&D (up to 50 staff): Up to 8 staff for testing lab, up to 12 staff for systems R & D, up to 20 staff for systems support, and up to 10 staff for seismic design.
  - Capacity development (up to 12 staff): Up to 6 staff in the training team, up to 6 staff in the change management team.
  - Performance management (up to 16 staff): Up to 6 staff in systems monitoring team, up to 10 staff in performance evaluation and knowledge management team.
  - Communication (up to 12 staff): Up to 6 staff in social marketing and public education, up to 6 staff in public advocacy team.
  - Resilience Support Teams (up to 18 staff): up to 6 staff in the legal team: up to 12 staff in the admin, finance and IT support team.

Chief Resilience Officer (CRO): The title of the senior officer of the URU is revised to reflect a broader role than purely engineering. The CRO must act primarily as a champion and influencer to build understanding, commitment, and support for the urban resilience agenda. This agenda is varied. In the proposed URU design, it includes not only engineering aspects, but also planning, law, communication and public education, research and development, training and capacity development, and measurement and evaluation. In the future, the URU may develop capacity in other areas of significance to a wider urban resilience agenda. The CRO's role will be primarily strategic and outward looking, building and maintaining collaborative networks with all internal and external stakeholders. He or she will lead an executive team that will take responsibility for the formulation and execution of work plans and budgets.

Executive Teams

- Research and Development (R&D): comprising four sub-teams focused on (1) laboratory testing, (2) systems R&D, (3) systems support, and (4) seismic design, engineering, and retrofitting. The R&D team is collectively responsible for problem identification to assist applied disciplines (such as retrofitting) or management systems and processes (such as the ECP or knowledge management systems), systems and product research, design, building, and testing. The system support team is intended to provide operational guidance, troubleshooting, maintenance, and technical assistance to other departments of RAJUK or other service users and implementers, who are operating URU products.
- Capacity Development: comprising a training team and an organizational change team. The organizational change team maintains close communication across RAJUK and the wider stakeholder network to model organizational change processes. They will identify enablers and inhibitors of change, appraise the merits of different change options through Pareto analysis and other methods, and support the design and implementation of reformed work processes and policies. The training team identifies existing and evolving training needs across RAJUK and the stakeholder network through regular assessment of needs and engagement with clients. They design, commission, monitor, and evaluate the requisite training packages and adapt them to evolving needs.
- Performance Management: comprises a systems monitoring team and a systems evaluation and knowledge management team. The teams will develop and socialize key performance indicators for process implementation in services, systems, communication, and training across the organization to monitor whether milestones are met. The systems evaluation team analyzes performance metrics using a range of methodologies, potentially including quasi-experimental design, to measure impact and value for money. They also develop and manage systems and processes to ensure dissemination and application of research findings across RAJUK and the construction sector.
- Communication: comprises the policy advocacy team and the social marketing and public education teams. The URU will utilize its research findings and feedback from across its stakeholder network to identify desirable policy changes to enhance urban resilience. It will then coordinate stakeholders inside and outside of government to advocate for such changes that are needed using a range of methods. The social marketing and public education team is concerned with the creation of demand for earthquake resilient construction by heightening awareness of key stakeholders and the public to the risks and what can be done to mitigate them.

4.6 Operational Recommendations

Although RAJUK has operational challenges, there are several opportunities that will be beneficial in moving forward and developing the URU. In many cases, building owners do submit applications for building permits to RAJUK. As a result, most of the buildings under construction have gone through the building permit review process by RAJUK. Professional developers are familiar with the procedure and what is required to build in the city of Dhaka.

RAJUK also recognizes its current limitations: shortage of staff (inspectors, technical staff, civil engineers), lack of logistic support (transportation and communication for inspectors during site inspections, computers and printers for office staff), current on-line approval system (not all departments are connected, software not fully developed, no access to Detailed Area Plan maps, and loopholes in the current system), and established training for staff (on-site mentoring program for inspectors may result in differences between zones). The future growth and increase in building construction in Dhaka along with the current limitations realized by RAJUK confirm the timing is right to establish the URU.

4.6.1 Changes to the Permitting/Inspections Processes to Promote Resiliency

There are changes that can be made in the near term to promote resiliency in the permitting and inspections process. Some of these recommendations relate directly to structural integrity of buildings, while others seek to improve compliance overall by making processes more efficient.

Electronic Construction Permitting

- Development of a streamlined electronic construction permit (ECP) system is critical. More details on the ECP system and proposed streamlining can be found in the URP-S07 Inception Report. To summarize here, the system will include all parameters required for review and approval of building plans submitted for construction permits. The ECP will be used across all eight zones, be accessible to all relevant departments within RAJUK, and be connected to other agencies involved in the building permit approval process.
- The ECP system will be transparent so that staff and applicants know the status of a given building permit application and where it is in the approval process. If there are issues with the submittal or comments to be addressed after the first review, the applicant will be notified and be able to review the issues or comments on-line. If the construction documents require revisions, the applicant will be able to upload the revised drawings along with responses to the review comments, and the reviewer will be notified. Applicants and staff will be able to digitally sign documents and pay fees online.
- Digital signatures through the ECP will also prevent forging of architects and engineers' signatures.

Structural Plans and Fast Automated Structural Plan Check (FASP)

- It is recommended that an automated structural design review system be developed and used during the building permit approval process. The structural drawings must be included in the application process. The Fast Automated Structural Plan Check (FASP) tool will be used to check key and critical elements of the structural design based on the building type and structural configuration, and will be supported by the ECP system. Simple data entry will be

used to identify and capture gross errors regarding selected critical structural elements (e.g., size of columns, quantity and configuration of longitudinal and transverse reinforcing, list of requirements and graphical diagrams of detailing required at critical locations in the structure). The FASP tool will also include some simple checks related to the architectural requirements of a building. If the submitted drawings fail the FASP check, then the design engineer/architect can either correct the plans and upload updated drawings, or submit a letter of compliance, explaining how the design meets the intent of the BNBC.

- In the beginning, an alternate system for plan review of buildings that are 10 stories and higher or buildings with large plan areas can be established. A system of peer review could be set up for design and construction phase for special building types. The peer review would be performed by qualified structural engineers. The design engineer and peer review engineer would submit signed letters of code compliance. Selected peer reviews can be audited by RAJUK. Once the URU builds capacity and knowledge, peer review can be replaced with review by URU/RAJUK staff.

Handling Deviations

- Enforcement of the existing building regulation stipulating that owners/developers are required to submit revised plans to RAJUK for approval, should deviations during construction occur, is critical to ensure compliance with the planning and building code requirements. There is an opportunity to streamline this process with the introduction of the ECP system. The architect and engineer of record must be responsible for provided these revisions to RAJUK.

Using Fast Remote Sensor Construction Monitoring (FRCM)

- To better ensure BNBC compliance during construction, it is recommended to develop an automated remote monitoring system to be used by the contractor's engineer during the construction phase. The Fast Remote Sensor Construction Monitoring (FRCM) will be integrated in the ECP and will be used to build a construction activity database.

- A mobile application would be used during construction to capture incremental data for architectural and structural monitoring. For architectural monitoring, some of the data could include measured setbacks, measured total floor area, plan configuration, and number of stories. For structural monitoring, some of the data could include column and beam sizes, wall thicknesses and lengths, longitudinal and transverse reinforcing bar sizes and configurations, and conditions at beam and column joints.

- The contractor's engineer will visit the construction site at critical phases and upload data and photos to the ECP. The data and photos that are uploaded will be audited by the RAJUK inspectors. If changes occur during construction, updated drawings will be submitted through ECP and will go through the process for design modifications (discussed above).

Issuing Certificates of Occupancy

- Currently, a Certificate of Occupancy will be issued if the design architect/engineer and the builder file all documents during construction, along with a certification of completion signed by design architect/engineer. As previously described, only an estimated 2% of all buildings receive Certificates of Occupancy. This is a serious issue that affects safety and urban resilience

in Dhaka. It is a major warning factor of building code non-compliance and failure of the construction monitoring phase.

- To address this problem, the first recommendation is to develop a better process for handling design modifications made during construction, as discussed above. The second recommendation is to create an awareness among professionals and the public about why Certificates of Occupancy are important. This will involve a public outreach program and campaign regarding the importance of proper construction that is in line with the BNBC, the importance of the URU, and the importance of RAJUK. The public outreach campaign should target financial institutions, insurance companies, corporations, international businesses and agencies, investors, and the public. The campaign should stress the importance of a Certificate of Occupancy and what it means when a building has not been certified.

- Buildings that are designed per the BNBC, approved for construction by RAJUK, have passed inspection during construction, and have a Certificate of Occupancy will most likely perform better during an earthquake. The building may have architectural and some limited structural damage, but the occupants are able exit the building safely. In other words, "Better Construction Saves Lives."

Use of URU "Resiliency Certificate"

- To better inform the public about safety and increase market demand for resilient buildings, "URU Certified" plaques can be made and prominently displayed on buildings that have a Certificate of Occupancy. Additionally, buildings that have been certified can be shown on a website that is accessed through the ECP. The website could indicate those buildings that have been certified (such as with a gold star) and those that have not been certified (such as with a red dot). This transparency and positive reinforcement will result in a greater number of buildings that are certified and will help build resiliency.

Creation of One Stop Shop for Approvals

- The current need for large and special building applicants to obtain NOCs from almost a dozen other agencies before even applying for a building permit is burdensome, time consuming, and drives up the cost of construction in Dhaka. International best practice consolidates all approvals into a One Stop Shop (OSS), where the applicant is able to submit one application though a "single window". The OSS or, in this case, the ECP, then sends the application package to all organizations involved in the permitting process. This happens automatically. The NOC organizations access the application and return their consent through the ECP.
- Personnel supporting this URP-S06 project have already met with many of the NOC agencies and received positive responses for participation in a OSS. These include FSCD, DoE, DCCN, and CAAB. The next step will be to review the regulations and policies of these authorities and to secure a memorandum of understanding between them and RAJUK setting forth a common understanding of how the organizations will interact in the OSS.

4.6.2 URU Support for Hazard Risk Assessment

URP-S04 is supporting RAJUK in conducting a hazard vulnerability risk assessment. It is anticipated that this project will assess 2,000–5,000 buildings. At the end of the project, the GoB will have an

investment list to prioritize retrofitting. The URU will need to be ready to continue the plan established by this project. While recommendations on URU functionality in this area are expected in the future from the URP-S04 project, some functions could include:

- Issuing and managing procurements for retrofitting
- Developing and maintaining a database of Vulnerability Risk Assessments of Critical Infrastructure of Dhaka. This would involve:
  - Developing and maintaining a subset of all infrastructure considered
  - Maintaining a current inventory of buildings including construction date, any alterations, and approximate number of occupants
  - Maintaining a citywide seismic hazard map and microzonation (to be available on the internet)
  - Documenting change of occupancy from regular to critical designation
  - Collaborating with BUET and IEB.

Staff required for above tasks include: civil/structural engineer, geotechnical engineer/seismologist, mapping/IT engineer, project managers, procurement specialists.

4.6.3 URU Support for RSLUP

URP-S05 is supporting RAJUK in drafting a risk sensitive land use plan. The URU will need to be ready to take over functions related to this topic or to support capacity building for RSLUP within the existing Planning Department. While recommendations on URU functionality in this area are expected in the future from the URP-S05 project, some functions could include:

- Maintaining the Risk Sensitive Land Use Plans of Dhaka
- Educating the Planning department and local planners on RSLUP
- Maintaining electronic searchable mapping for at risk areas
- Maintaining a seismic hazard map and liquefaction map of Dhaka
- Maintaining a list of identified critical vulnerable buildings and locations
- Disaster risk planning for future events in the at-risk areas
- Collaborating with BUET, IAB, and IEB

Staff required for above tasks are urban planners, civil engineer, geotechnical engineer, DRM coordinator and communication experts.

4.6.4 URU Support for BNBC Compliance

In addition to support from this project and URP-S07 for improved construction permitting and inspections—both of which support BNBC compliance—RAJUK is receiving support from URP-S09 and JICA. Recommendations on URU functionality in this area are expected in the future from URP-S09 and JICA.

URU's role could include:

- Responsibility for the ECP system, including training and updating

- Conduct/support Development Control to conduct improved construction permitting and monitoring
- Maintain/participate in building code development
- Conduct training and outreach on BNBC
- Implement a mechanism for code violation tracking by ECP
- Ensure all submittals are by a registered engineer and ensure submittals comply with code provisions and building regulations
- Establish a code compliance committee responsible for updating and adapting changes, and for assurance of code compliance for alternate design methods
- Promote better enforcement of building rules
- Encourage use of Occupancy Certificates/URU "Resiliency Certificates"
- Collaborate with BUET, IAB, and IEB, especially to increase professional competencies related to urban resilience.

Staff required for above tasks are architects, civil engineers, inspectors, IT engineers, lawyers, and communications specialists.

4.6.5 Research and Development and Soil and Materials Testing

R&D and material testing for construction could be a major revenue generation source for the URU and would include:

- Maintain an accredited laboratory for testing
- Keep record of all instrumentation and their calibration and data acquisition systems
- Maintain laboratory test equipment
- Maintain machine shop, concrete lab, geotechnical lab
- Train laboratory personnel for basic repair of equipment
- Collaborate with BUET
- Promote services to private industry.

Staff required for above tasks are civil engineer, geotechnical engineer, electrical engineer, testing engineer, mechanics, administrative, and sales staff.

4.6.6 URU as a Training Provider

The URU must play a key role in educating the industry and the public about urban resiliency. This function will be aided by the URU's premier training facility.

Training includes conducting/sponsoring research, training, forums and workshops, on:

- BNBC enforcement, including (1) activities aimed at better dissemination, understanding, and implementation of building construction standards among professionals in the construction industry; and (2) oversee and monitor implementation of professional accreditation programs
- Urban resiliency matters, including vulnerability and risk assessment, urbanization and urban resiliency of the cities, earthquake engineering, construction standards and permitting,

building codes and standards, implementation and application of risk-sensitive land use plans, etc.

- Seismic design and retrofit of critical structures such as schools and hospitals
- Staff required for above tasks are civil/structural engineers, earthquake engineers, qualified training designers, and coordinators.

4.7 Legal Framework Recommendations

Some of the changes discussed above will require changes to the Construction Guidelines. Potential changes may include, but not be limited to:

- **Allowing/Requiring filing applications on-line—**The Guidelines will need to change to allow/require filing applications and documents on-line. Currently, the Construction Guidelines require that multiple copies of applications and documents must be filed.[57] The Guidelines also specifically set forth the size of paper to be used for drawings.[58] This needs to change to allow digital copies of drawings to be uploaded.
- **Paying fees on-line—**The ECP system will allow applicants to pay fees online. The Guidelines need to be changed to allow this. Currently, the Guidelines require that payment receipts have to be submitted as part of the document package.[59]
- **Allowing electronic signatures—**The ECP system will use electronic signatures, and these electronic signatures must be recognized by the law and allowed by the Construction Guidelines. Currently, the Guidelines require that applicants sign documents and that applicants and design professionals sign drawings.[60] The Guidelines do not specifically say how RAJUK officials will sign approvals
- **Requiring structural designs—**The Guidelines will need to be revised to require submittal of the structural designs and create the procedure for the Fast Automated Structural Plan Check (FASP) tool.
- **Construction monitoring procedures—**The Guidelines will need to be revised to establish procedures for Fast Remote Construction Monitoring (FRCM).
- **Streamlining procedures for requesting approval for modifications—**As previously mentioned, current procedures exist but are not being used. These procedures should be reviewed and streamlined as much as possible to encourage compliance.

Some of these changes may be alleviated by the ICT Act, and this is something that should be analyzed by the RAJUK Legal Section.

Additionally, other initiatives to change the legal framework or construction permitting practices currently are underway that could affect the development of the ECP system. Those include, but may not be limited to:

- RAJUK and BIDA are working on changes to the construction permitting process that will reduce the number of Non-Objection Certificates (NOCs) for construction from 11 to 3. The main motivation for this initiative is to improve Dhaka's ranking in the Dealing with Construction Permits indicator for the World Bank *Doing Business* report. At the same time,

[57] Three copies of the application for Land Use Clearance must be signed and filed, along with 3 copies of the survey map. Construction Guidelines, para. 4(4). One application and 11 copies of documents must be filed for Special Project Clearance. *Id.*, para. 8(3). And for Construction Permits, 1 application and 8 copies of documents are required. *Id.*, para. 13(2).
[58] *Id.*, paras. 13(4) and (5).
[59] *Id.,* para. 13(4)(b). Note: Land Use Clearance requires payment of a fee, but the Guidelines do not specifically say that the payment receipt must be filed. *Id.*, para. 4(3).
[60] *Id.,* paras. 4(4), 8(4)(n), 8(5), and 13(3).

the ECP project team is reaching out to all 11 NOC agencies to integrate them into the single window of the ECP. Many have already agreed. Therefore, it is essential to have clarity on which NOC agencies will be involved in the construction permitting process.

- Moreover, the draft BNBC is being considered for approval. This version of the BNBC needs to be harmonized with the changes to the Construction Guidelines discussed above, and with the URP programs. For example, the draft BNBC requires submittal of paper copies of drawings. As discussed above, the ECP will use digital submittals. The draft BNBC also recommends formation of a new construction oversight entity. This should be harmonized with existing plans for the URU.

4.8 Organizational Development Recommendations

- Skills and Resource Optimization Recommendations for URU
  - The PIU (which is more or less expected to be transformed into the URU) has focused largely on recruitment of relatively junior graduate engineers, town planners and architects, along with some limited IT capacity for GIS, network administration and technical support. Future recruitment must focus on identification of more experienced capacity to work as executive team leaders. The URU must also now focus on identification of appropriate capacity at senior, mid-level and junior levels of experience and qualification in the following areas:
    - Communications
    - Social marketing
    - Program monitoring and evaluation
    - Knowledge management
    - Research methodologies
    - Structural / seismic engineering laboratory testing and management
    - Policy analysis, advocacy, and law
    - Training and human resources development
    - Systems research and design
    - Systems engineering.
- Evolution of the organizational culture.

Organizational culture evolution priorities are to encourage the adoption and promotion of the following core values and behaviors:

- Learning and continuous improvement
- Relentless problem solving
- Informed and persistent advocacy
- Commitment to partnership and collaboration within RAJUK and across the network of stakeholders
- Champion of urban resilience
- Engineering excellence
- Robust implementation of process and quality assurance
- Commitment to performance management
- Openness to feedback and criticism.
- Transparency, honesty and zero tolerance of corruption.

Senior staff must be models of these values and behaviors for the benefit of RAJUK and URU colleagues. They must also work towards the inclusion of these values and behaviors in all systems, processes, trainings, and communications.

Annex A: Stakeholder Table

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
INTERNAL - RAJUK -URU Stakeholders			
Bangladesh Ministry of Housing & Public Works	National Government	MoHPW regulates state construction and provides housing throughout Bangladesh. RAJUK is housed under the MoHPW.	Provides oversight and support for the URU's scope and mission through RAJUK leadership.
RAJUK Leadership	Key Leaders	By law, RAJUK is comprised of a Chairman and five members. RAJUK employs other senior management staff that provide oversight and guidance across RAJUK's five departments.	Provide oversight and support for the URU's scope and mission.
RAJUK Administration & Finance Department	RAJUK Division	RAJUK's Administrative and Finance Department provides administration, finance, budget, and legal services across the organization.	Provide indirect support to the URU and benefit from the URU's work and contributions.
RAJUK Development Department	RAJUK Division	RAJUK's Development Department develops land and buildings.	Provide indirect support to the URU and benefit from the URU's work and contributions.
RAJUK Development Control Department	RAJUK Division	RAJUK's Development Control Department issues construction permits, monitors construction, and enforces building laws.	Provide indirect support to the URU and benefit from the URU's work and contributions.
RAJUK Estates and Land Department	RAJUK Division	RAJUK's Estates Department manages and disposes of land and buildings developed by the Development Department.	Provide indirect support to the URU and benefit from the URU's work and contributions.
RAJUK Planning Department	RAJUK Division	RAJUK's Planning Department oversees and guides Dhaka urban planning at sub-regional, urban, and sub-urban levels.	Provide indirect support to the URU and benefit from the URU's work and contributions.
RAJUK Staff (those relevant to URU)	Employees	RAJUK and the MoHPW employs ## staff across RAJUK's five divisions (Admin & Finance; Planning; Development Control; Development; Estate and Land)	Provide indirect support to the URU and benefit from the URU's work and contributions.

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
URU Leadership	Key Leaders	RAJUK and the MoHPW will employ ## senior and mid-level managers to support various aspects of URU's scope and mission.	Provide guidance and leadership over successful implementation of URU's scope and mission.
URU Staff	Employees	RAJUK and the MoHPW will employ ## non-management, individual contributor-level employees to support various aspects of URU's scope and mission.	Directly support URU's scope and mission.
EXTERNAL - GOVERNMENT, UTILITY & REGULATORY Stakeholders			
Bangladesh Department of Disaster Management (DDM)	National Government	Housed under the Ministry of Disaster Management and Relief, DDM is responsible for risk reduction activities, responding to disaster events efficiently and coordinating/strengthening other stakeholder efforts related to DDR and DRM.	DDM's aims are very closely link and overlap with the URU's scope and mission. DDM is well- positioned to provide direct and indirect collaboration and other support to the URU.
Bangladesh Department of the Environment (DoE)	National Government	DoE is responsible for ensuring the application of environmental rules and regulations throughout Bangladesh.	DoE is likely to be generally invested in the URU's scope and mission. Overlap and collaboration on mutual areas of interest seems likely.
Bangladesh Fire Service and Civil Defense (FSCD)	National Government	FSCD provides firefighting, fire safety prevention, and disaster risk management support throughout Bangladesh. FSCD also has responsibility for enforcing rules and regulations related to fire safety in construction and occupancy permitting.	FSCD currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Key Point Installation Defense Committee (KPIDC)	National Government	This committee sets conditions for constructions near key installations, like military bases or government offices and residences.	KPI currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Bangladesh Meteorological Department	National Government	Housed under the Ministry of Defense, BMD is the national meteorological organization of Bangladesh. BMD maintains a network of surface and upper air observatories radar and satellite	BMD is a key resource for understanding and predicting natural disasters and weather patterns that may lead to natural disasters.

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
		stations and other weather and atmospheric systems for GoB.	
Bangladesh Ministry of Disaster Management & Relief (DMR)	National Government	DMR is responsible for Bangladesh-wide national disaster response and relief, including earthquakes and floods.	Like the DDM it houses, DRM's aims are very closely link and overlap with the URU's scope and mission. DRM is well-positioned to provide guidance, collaboration and related support to the URU.
Bangladesh Housing and Building Research Institute (HBRI)	National Government	HBRI is an autonomous organization under the MoHPW. HBRI is Bangladesh's only national research institute. It has a constitutional framework of 18-member Governing Council. HBRI is funded by government grants and conducts research on housing problems, innovation in construction materials, technology, and planning.	HBRI and URU may share complementary and overlapping research interests. These shared interests would be a natural point of coordination and collaboration.
Bangladesh National Housing Authority (NHA)	National Government	NHA addresses housing issues across Bangladesh including but not limited to the lack of adequate, affordable housing in Bangladesh.	Links to ECP and URU TBD
Civil Aviation Authority of Bangladesh (CAAB)	National Government	Operating under the Ministry of Civil Aviation & Tourism, CAAB regulates all aviation-related activities throughout Bangladesh, including operating all 9 airports.	CAAB currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Dhaka Electricity Supply Authority (DESA) now known as the Bangladesh Power Development Board (DPDB)	Utility	DPDB is a public sector organization responsibility for the planning and developing the national's power infrastructure and operating many of Bangladesh's power generation facilities. The board is now under the Power Division of the Bangladesh Division of the Ministry of Power, Energy, and Mineral Resources.	DESA currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Dhaka Electricity Supply Company. Ltd. (DESCO)	Utility	DESCO is a public limited electricity distribution company that distributes electricity to the northern parts of Dhaka City and Tongi Town of Gazipur District.	CESCO currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Dhaka Metropolitan Police - Traffic (DMPT)	Local Government	DMPT is the city police department for Dhaka City. The Traffic Division has some construction permitting responsibilities related to traffic flow and parking.	DMPT currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Dhaka North City Corporation (DNCC)	Local Government	DNCC is autonomous body that governs 36 northern wards of Dhaka.	DNCC currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Dhaka South City Corporation (DSCC)	Local Government	DSCC is autonomous body that governs 57 northern wards of Dhaka.	DSCC currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Bangladesh Planning Commission	Local Government	Under the Ministry of Planning, BPC is an economic and public policy institution of GoB. The BPC undertakes research studies and policy development initiatives that support the growth of the national economy and the expansion of the country's public infrastructure.	Links to ECP and URU TBD
Dhaka Power Distribution Company, Ltd. (DPDC)	Utility	DPDC is a public limited company under the Power Division of the Ministry of Power, Energy, and Mineral Resources for the GoB. DPDC manages electricity distribution to the Dhaka City Corporation area.	Links to ECP and URU TBD
Dhaka Public Works Department (DPWD)	Local Government		Links to ECP and URU TBD

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Dhaka Town Planning Department	Local Government	Dhaka Town Planning Department handles land clearance for construction permitting in unplanned areas as part of their city planning and construction regulation responsibilities for the unplanned areas of Dhaka City.	Links to ECP and URU TBD
Dhaka Transport Coordination Authority (DTCA)	Local Government	DTCA is the main government agency responsible for public transport in Dhaka. Under the Revised Strategic Transport Plan any changes to transport infrastructure will need approval from the Dhaka Transport Coordination Authority	DTCA currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Dhaka Urban Development Directorate (UDD)	Local Government	UDD advise the GoB on matters of policy relating to urbanization, land use and land development.	Links to ECP and URU TBD
Dhaka Water Supply and Sewage Authority (DWSSA)	Utility	DWSSA is an independent organization with the mandate of Water Supply and Sewage disposal to the city dwellers of Dhaka.	DWSSA currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
TITAS Gas Transmission & Distribution Company Ltd.	Utility	TITAS Gas Transmission and Distribution Company is the largest natural gas distributor in Bangladesh, with an 80% market share.	TITAS currently issues No Objection Certificate (NOC) for certain building permits and is a candidate to integrate into a One Stop Shop.
Doing Business improvement working group	National Government	Upon authority of the PM's office, the GoB has constituted a working group to improve the country's Doing Business ranking across multiple indicators, including Dealing with Construction Permits. Both BIDA and RAJUK (through the Chairman and Director of Development Control) are currently attempting to streamline the construction permitting system.	This initiative may impact definition of "To Be" permitting processes for development of the ECP system, as well as efforts to coordinate a One Stop Shop.
EXTERNAL - INDUSTRY Stakeholders			

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Ahsanullah University of Science and Technology	Academic Institution	Ahsanullah University of Science and Technology or commonly known as AUST is the first non-government engineering university to be established in Bangladesh.	Ahsanullah University of Science and Technology may be a vital stakeholder and resource in operationalizing the scope and mission of the URU.
Bangladesh Association of Construction Industry (BACI)	Industry Association	BACI is a non-political, non-profit, GoB-approved trade organization supporting the construction companies of Bangladesh.	Private sector developers and contractors have a crucial role to play in ensuring resiliency through compliance with permitting laws and the BNBC.
Bangladesh Professional Engineers Registration Board (BPERB) -- Part of IEB	Industry Association	Part of the Institution of Engineers of Bangladesh, BPERB is the registration and accreditation arm of IEB. BPERB registers engineers in Bangladesh.	Accreditation of engineers is a key component to urban resiliency to ensure both professional competency for structural and other design and compliance with the BNBC.
Bangladesh University of Engineering and Technology - Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS)	Academic Institution	Financially supported by the Gov't of Japan, BUET-JIPUS provides a platform for teaching, learning and research in the field of disaster prevention and urban safety that will contribute to reduce disaster risk of the country. The aim of this institute is to assist the government of Bangladesh to strengthen and maintain the infrastructures all over the country and to prevent and well manage natural disasters.	BUET-JIDPUS may be a vital stakeholder and resource in operationalizing the scope and mission of the URU.
BUET, Department of Architecture	Academic Institution	BUET, Department of Architecture encompasses three departments: Architecture, Urban and Regional Planning and Humanities with faculty specializing in with specializations in housing, environment, urban design, health facilities, educational facilities, etc. The Architecture Department at BUET offers bachelors, masters, and PhD degrees.	BUET, Department of Architecture may be a vital stakeholder and resource in operationalizing the scope and mission of the URU.

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
BUET, Department of Civil Engineering	Academic Institution	BUET, Department of Civil Engineering is the largest department of Bangladesh University of Engineering and Technology (BUET). The department offers four year undergraduate program leading to B.Sc. degree and Master's and Ph.D. degrees. The department plays a very important role in the country's infrastructural development. Many important construction works and projects in the field of structural, geotechnical, transportation and environmental engineering are carried out with the consultancy services of this department.	BUET, Department of Civil Engineering may be a vital stakeholder and resource in operationalizing the scope and mission of the URU.
BUET, Department of Computer Science and Engineering	Academic Institution	BUET, CSE is the first department of its kind in Bangladesh and offers Bachelors, Masters, and Ph.D. Degree in Computer Science and Engineering. The Education of CSE BUET is world class in both the Curricula and Research activity. Currently there are about 700 students studying in Undergraduate Program and about 40 students in Graduate Program.	BUET, CSE may be a vital stakeholder and resource in operationalizing the scope and mission of the URU.
Dhaka University, Department of Geography & Environment	Academic Institution	Dhaka University, Department of Geography & Environment's prime objective is to make students aware of the relationship between Human and the Physical Environment. The Department offers courses on Physical Geography; Human Geography; Regional Geography; Environment and Geo-spatial Techniques.	Links to ECP and URU TBD

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Environment & Infrastructure Management Solutions, Ltd.	Private Industry	EMIS is a multidisciplinary engineering organization that operates as a Limited Shared Company. It is engaged in the areas of civil engineering design, structural auditing, visual inspection and vulnerability assessment, legal inputs, project management and consultancy services in various sectors like residential Buildings, Garment Factories, Water Resources, Power Plants and Environmental works.	Links to ECP and URU TBD
Institute of Architects Bangladesh (IAB)	Industry Association	IAB is a professional institute to safeguard, promote and develop the profession of architecture in Bangladesh. IAB has 6 experience-based membership categories and current membership is: 3156 (Honorary Member 02, Fellow 440, Member 981, Associate Member 1636, Student Member 97).	Ensuring competency and ethical conduct by design professionals is key to urban resiliency.
Institution of Engineers Bangladesh (IEB)	Industry Association	IEB is the Institution of Engineers, Bangladesh is the national professional organization of engineers in Bangladesh. It currently has 41,545 members and membership is tiered based upon the member engineer's experience. IEB is primarily focused on serving its membership and continuously improving professional standards for engineers in Bangladesh.	Ensuring competency and ethical conduct by design professionals is key to urban resiliency.
Land Developers	Private Industry	Entities or individuals who acquire property and oversee construction of residential, commercial, or industrial structures.	Private sector developers and contractors have a crucial role to play in ensuring resiliency through compliance with permitting laws and the BNBC.
Real Estate Agents	Private Industry	Individuals or companies who sell or rent buildings or land for clients.	Private sector developers and contractors have a crucial role to play in ensuring resiliency through compliance with permitting laws and the BNBC.

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Real Estate & Housing Association of Bangladesh (REHAB)	Industry Association	REHAB is the trade organization representing the interests of Bangladeshi real estate developers.	Private sector developers and contractors have a crucial role to play in ensuring resiliency through compliance with permitting laws and the BNBC.
EXTERNAL - PUBLIC Stakeholders (Local/National/ Civil Society/ Community)			
General Public	Community	General citizens of Dhaka and Bangladesh more broadly.	This is likely the largest stakeholder group in the list and is the stakeholder group most directly affected by the other organizations. They are the consumers who will buy, rent, live in/around buildings (permitted or not) in Dhaka. They are the number one outreach stakeholder.
Media Sector	Media Outlets	Bangladesh has a strong and vigorous media sector that produce content that is widely consumed directly and through social media	Bangladesh's media sector will be an instrumental partner for RAJUK-URU in raising public awareness and holding public and private institutions to account for the delivery of a more earthquake resilient urban landscape
Bangladesh Disaster Preparedness Center (BDPC)	Civil Society	The BDPC Bangladesh's first independent, local NGO focused solely on disaster risk reduction (DRR). Since 1982, BPDC has focused on community empowerment, knowledge promotion, and advocacy to lead change in policies and practices that promote disaster risk reduction.	BDPC invests in local solutions and adopting global best practices for catalysts for transformational change in Bangladesh's ability to mitigate the risk of natural disasters. This aligns well with the scope and focus of the URU. BDPC could be a key resource and partner for the URU given their overlapping interests.
Building Resources Across Communities (BRAC)	Civil Society	BRAC self-describes as the world's #1 NGO. BRAC works to empower the most underserved, disenfranchised women and men empowering them as they gain greater access to and assert more	As BRAC serves those most at-risk during natural disasters and their scope and reach within Bangladesh is so vast that they are well positioned

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
		control over resources decisions and actions.	to be a key stakeholder in the URU's outreach efforts.
Bangladesh Enhancing Resilience Program	Civil Society	The Enhancing Resilience Program is a multi-donor funded project that integrates asset creation activities with community training to build resilience among the rural ultra-poor using strategic efforts to empower individuals, enhance food security and nutrition and better manage natural disasters and climate change impacts.	
Alliance for Bangladesh Worker Safety	Civil Society	The Alliance for Bangladesh Worker Safety (Alliance) is a legally binding, five-year commitment to improve safety in Bangladeshi ready-made garment (RMG) factories. The Alliance joins apparel, retail and branded company members to create concrete transparent, results-oriented, measurable and verifiable solutions that make garment workers safer.	As upgrading factories, educating workers, and building institutions that can support creating safer working conditions throughout Bangladesh are key elements of their mission, the Alliance for Bangladesh Worker Safety could be a key stakeholder in the URU's outreach efforts and an ally in the URU's broader scope/responsibilities.
EXTERNAL - INTERNATIONAL Stakeholders (Donors, Partners)			
UK Department for International Development (DFID)	International Partner/ Donor	DFID leads the UK's work to end extreme poverty by tackling the global challenges of our time: poverty and disease, mass migration, insecurity and conflict. DFID works toward building a safer, healthier, more prosperous world for people in developing countries and in the UK.	

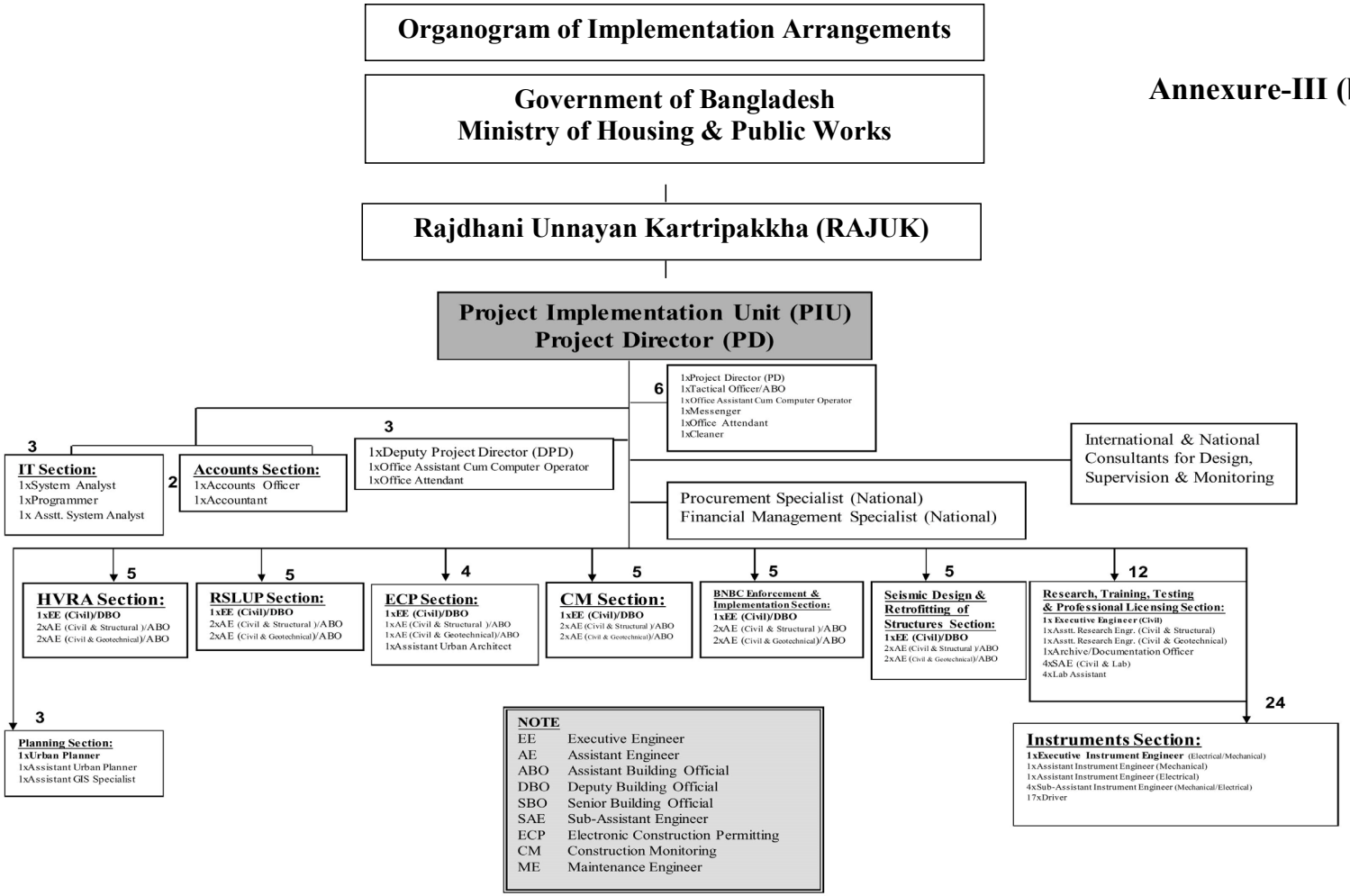
Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
Islamic Relief	International Partner/ Donor	Islamic Relief Worldwide is an independent humanitarian and development organization that partners with communities to provide disaster relief; promote integrated government and environmental custodianship with a focus on sustainable livelihoods; and addressing the root causes of poverty.	In Bangladesh, Islamic Relief is investing in disaster resilience addressing climate change, and humanitarian issues that overlap with RAJUK-URU's scope. Islamic Relief may be a partner and funder for future RAJUK-URU projects.
Japan International Cooperation Agency (JICA)	International Partner/ Donor	JICA is the Japanese International Cooperation Agency. It is the Japanese government's official agency in charge of development assistance. In Bangladesh, JICA is deeply in engaged in major infrastructure projects.	JICA has already invested in urban development and disaster risk reduction in Bangladesh. JICA will likely continue to be a significant partner for RAJUK-URU.
Oxfam	International Partner/ Donor	Oxfam is an international confederation of 199 organizations working together with partners and local communities in more than 90 countries to help create lasting solutions to poverty.	Oxfam's efforts in Bangladesh range from disaster relief to gender and women's leadership and a range of resilience focused initiatives. Oxfam could be a partner and funder for some R&D aspects that focus on DRM.
	International Partner/ Donor	SIDA is the Swedish government's international development agency. SIDA create opportunities for people living in poverty and under oppression to improve their living conditions. SIDA supports a wide array of development projects in countries across the globe.	In Bangladesh, SIDA supports Bangladesh in the implementation of its climate strategy and the strengthening of its disaster management systems. People living in urban slums are particularly vulnerable. Sweden supports several projects, including water and sanitation, in these areas.
UNDP Partnerships for Poverty Reduction (NuPPR)	International Partner/ Donor	An arm of the United Nations Development Programme that has an office and a specific goal in Bangladesh to make a significant improvement of the lives of at least 100 million slum dwellers by 2020.	NUPPR is a stakeholder and potential partner for the RAJUK/URU Outreach Campaign given their emphasis on community-led initiatives that focus on empowering poor and extremely poor women to

Stakeholders	Group/ Organization Type	Brief Organizational Description	Connection to/ Implications for RAJUK-URU
			manage their development and meet their own needs.
World Bank	International Partner/ Donor	An international organization with 184 member countries that aims to end poverty and boost shared prosperity through funding, advice, and capacity development.	Primary Donor/Funder for RAJUK - URU.

Annex B: RAJUK Organizational Chart

Annex C: Project Implementation Unit Organizational Chart

Annexure-III (b)



Total Manpower: 82

Within 2 Years, the Urban Resilience Unit should be a Separate Urban Resilience Division

Annex D: Salary And Benefits Schedule

Salary Grade Description for RAJUK Staff				
SL	**Position Name**	**Grade**	**Base Salary Range (Min - Max) in BDT**	**Remarks**
1	Chief Inspector	4	50000 - 71200	
2	Chief Urban Planner	4	50000 - 71200	
3	Chief Urban Architect	4	50000 - 71200	
4	Senior System Analyst	4	50000 - 71200	
5	Director	5	43000 - 69850	
6	Urban Planner	5	43000 - 69850	
7	Superintendent Engineer	5	43000 - 69850	
8	Urban Architect	5	43000 - 69850	
9	System Analyst	5	43000 - 69850	
10	Executive Magistrate	-	-	Deputation
11	Authorized Officer	6	35500 - 67010	
12	Deputy Director	6	35500 - 67010	
13	Deputy Urban Planner	6	35500 - 67010	
14	Deputy Architect	6	35500 - 67010	
15	Executive Engineer	6	35500 - 67010	
16	Law Officer	7	29000 - 63410	
17	Programmer	6	35500 - 67010	
18	Assistant Engineer	9	22000 - 53060	
19	Assistant Director	9	22000 - 53060	
20	Liaison Officer	9	22000 - 53060	
21	Assistant Authorized Officer	9	22000 - 53060	
22	Assistant Urban Planner	9	22000 - 53060	
23	Assistant Architect	9	22000 - 53060	
24	Assistant Law Officer	9	22000 - 53060	
25	Assistant Programmer	9	22000 - 53060	

Salary Grade Description for RAJUK Staff				
SL	**Position Name**	**Grade**	**Base Salary Range (Min - Max) in BDT**	**Remarks**
26	Deputy Assistant Engineer	10	16000 - 38640	
27	Chief Building Inspector	10	16000 - 38640	
28	Accountant	11	12500 - 30230	
29	Coordinator	10	16000 - 38640	
30	Estate Inspector	10	16000 - 38640	
31	Kanoongo	10	16000 - 38640	
32	Artist	10	16000 - 38640	
33	Deputy Assistant Architect	10	16000 - 38640	
34	Assistant Statistician	11	12500 - 30230	
35	Assistant GIS Analyst	10	16000 - 38640	
36	Documentation Officer	12	11300 - 27300	
37	Store Officer	12	11300 - 27300	
38	Security Officer	12	11300 - 27300	
39	Building Inspector	10	16000 - 38640	
40	Designer	12	11300 - 27300	
41	AutoCAD Operator	12	11300 - 27300	
42	GIS Operator	12	11300 - 27300	
43	Steno Typist cum Computer Operator	13	11000 - 26590	
44	Computer Operator	13	11000 - 26590	
45	Cashier	14	10200 - 24680	
46	Auditor	14	10200 - 24680	
47	Upper Division Clerk	14	10200 - 24680	
48	Steno Typist cum Computer Operator	14	10200 - 24680	
49	Photographer	14	10200 - 24680	
50	Security Coordinator	14	10200 - 24680	
51	Surveyor	15	9700 - 23490	
52	Photographic Assistant	15	9700 - 23490	
53	GIS Technician	15	9700 - 23490	

Salary Grade Description for RAJUK Staff				
SL	**Position Name**	**Grade**	**Base Salary Range (Min - Max) in BDT**	**Remarks**
54	Operator (Heavy Vehicle)	15	9700 - 23490	
55	Data Entry Operator	16	9300 - 22490	
56	Office Assistant cum Computer Operator	16	9300 - 22490	
57	Junior Accounts Assistant	16	9300 - 22490	
58	Bench Clerk	16	9300 - 22490	
59	Record Keeper	17	9000 - 21800	
60	Supervisor	16	9300 - 22490	
61	Transport Supervisor	16	9300 - 22490	
62	Heavy Vehicle Driver	15	9700 - 23490	
63	Light Vehicle Driver	16	9300 - 22490	
64	Tracer	17	9000 - 21800	
65	Pump Operator	17	9000 - 21800	
66	Plumber	17	9000 - 21800	
67	Electrician	17	9000 - 21800	
68	Work Assistant	18	8800 - 21310	
69	Photo Machine Operator	19	8500 - 20570	
70	Blue Printer Operator	19	8500 - 20570	
71	Dispatch Rider	20	8250 - 20010	
72	Office Assistant	20	8250 - 20010	
73	Survey Mate	20	8250 - 20010	
74	Security Guard	20	8250 - 20010	
75	Plumbing Helper	20	8250 - 20010	
76	Electrician Helper	20	8250 - 20010	
77	Helper (Mechanical)	20	8250 - 20010	
78	Cleaner (Mechanical)	20	8250 - 20010	
79	Gardener	20	8250 - 20010	
80	Cleaning Helper	20	8250 - 20010	

Annex E: Permitting Documents Required

Land Use Clearance

The following documents are required to be submitted for land use clearance:

1. Application (Form 101) – 3 copies, signed by the applicant;
2. Survey map of the site (drawn to the scale of either 1 : 5000 or 1 : 10000) – 3 copies;
3. Fee.

Special Project Clearance

The application for special project clearance must include:

1. Document showing applicant's ownership of the land – 1 copy; and
2. Information on the building - 11 (eleven) copies of the following:
    a. Copy of Land Use Clearance or No Objection Certificate (as applicable).
    b. Ownership, Holding Number, CS/RS, City Survey or latest published survey, Daag Number, Location identification in the case of a planned area and any other document specified by the authority, Porcha (settlement record), schedule, etc.
    c. Approximate total number of floors and total floor-area in the proposed building.
    d. Approximate floor-area in each floor.
    e. Total number of residential units, if applicable.
    f. Calculation of FAR.
    g. Approximate requirement of water necessary for the proposed development work, its source and its supply system.
    h. Approximate requirement of electricity for the proposed development work, its source and its supply system.
    i. Sequence of activities associated with the construction work, its starting time and estimated period of time it will take to complete the construction work.
3. 11 (eleven) sets of Conceptual Drawing (drawn to a minimum scale of 1 : 1000) including or indicating:
    a. Boundary of the site, adjacent land under the ownership of the applicant (if any) and measurements of road.
    b. Mark showing the North side of the site.
    c. Name of the adjacent road of the site, or if the site is adjacent to the road under the ownership of any individual, the name of the road from which the road under the ownership of any individual has originated.
    d. Mouja, holding number, plot and road numbers of the proposed site for the project.
    e. Width of all roads adjacent to the site and also width and location of the footpath (if any).
    f. Average height of the plot with reference to the attached road.
    g. Location and use of the existing or proposed buildings or other structures on the site, showing external measurements and distance from the boundary of the site.
    h. Approximate locations, heights and distance from the boundary of the site of buildings and structures attached to the site.
    i. Locations of the entrance and exit in the site for the vehicles and pedestrians.
    j. All the road-side drains, natural water drainage channels, flow of water and the proposed water drainage system attached to the site.

k. Existing electrical lines, water supply lines, location and proposed connection of the sewerage system (if any).
l. Proposed garbage collection spot inside the site and in the case of an industrial area waste removal management.
m. Locations of all natural elements (water reservoir, open space, garden, hill, etc.) and historic buildings within 250 (two hundred fifty) metres of the site and location of the site.

Construction Permit

Applications for construction permits require:

a. Form 301.
b. Copies of Land Use Certificate and Special Project Permit as applicable.
c. Receipt showing the fee was paid.
d. Documents showing legal ownership of the applicant on the land or building to be used for the proposed development work.
e. As instructed in the Special Project Permit, Soil Test Report prepared by the qualified technical personnel, in the cases where it is applicable.
f. In the case of an apartment building, total number of residential units per floor.
g. Area of the plot, calculation of FAR, covered land, measurements of the place for set-back and total number of floors.
h. For construction of deep foundation, piling, basement or underground floor, as the case may be, compensation bond signed by the applicant, and
i. As a proof of experience of the architect engaged in the project, a copy of the certificate issued by his professional institute mentioning that the architect is enlisted with them as a technical person.
j. Construction drawings, which must include:
    i. Name, address, phone number (if any) and unprinted signature of the applicant along with title of the drawing.
    ii. Name, address, phone number (if any) and unprinted signature of the concerned planner, architect or engineer together with their membership numbers and registration numbers of relevant professional institutions.
    iii. Reference number and date of approving the lay-out drawing along with name and address of the allottee of a plot or holding, name of the road or area in the cases of lands or plots planned and developed by the government, and name and address of the owner of a plot or holding, name of the road or area in the cases of plots developed by any non-government organization.
    iv. Holding number, name of the road or area together with reference number and date of Land Use Certificate where applicable, in the case of an individual or others.
    v. Reasons for construction and proposed use, and
    vi. Name of the thana (Police Station) under which the site falls, along with name of the Mouja, and CS/RS/SA, daag number or plot number.
k. The Site Plan or drawing of the area shall be drawn to the minimum scale of 1 : 4000, which must include the following information:
    i. The mouja (meaning : a group of villages regarded as an administrative unit) wherein the site is located, the CS map of the site including its location, and if needed, parts of RS or SA map or in the case of project developed by the government or by any authorized non-government organization, parts of drawing of the project area including location of the site, and

ii. Indicator of daag (meaning : bounded plot of land bearing an official number) of the site or plot, and location of daag of the neighbouring areas or plots.

l. The lay-out drawings must be drawn to the scale of 1 : 200, which must include the following information :
   i. Boundary and measurements of each side of the site.
   ii. Where applicable, the perimeter of the buildings situated on the site, measurements of the external parts of the buildings, height, number of floors and measurements of compulsory open spaces.
   iii. Where applicable, locations of the buildings and structures ---- both proposed and existing ---- on the site, locations of ponds / water reservoirs, gardens, other areas, low lands, open grasslands, forest areas, etc.
   iv. Names of the areas and roads.
   v. Indication of directions of the site and plot with respect to the adjacent roads, width of the roads attached to the site, and in the case of private roads or own roads length and width of the entire road.
   vi. Location of the Gate at the entrance and exit of the site from the road.
   vii. Location of drains (if any) along with indication of water-flow direction surrounding the proposed and existing buildings.
   viii. Locations of connections (if any) with the underground water reservoir, septic tank and soak pit, sewerage line, and
   ix. Location of waste/refuse matter collection place inside the site.
   x. In the case of a large project containing more than one buildings, other structures and installations, a key-plan shall have to be made wherein locations and perimeters of all the buildings or structures, lay-outs of roads, all objects on the land and all geographical elements such as trees, hills, ponds or water reservoirs, earth excavations or earth-fillings, etc. shall be exhibited.
   xi. Floor-plans of all the floors including the underground and mezzanine floors of a building shall have to be made on the map of a 1 : 100 scale, wherein the following matters shall have to be included :
   xii. Measurements, shapes, locations and use of all the rooms and spaces including locations of the doors and windows.
   xiii. Where applicable, locations and measurements of stair-room, lift-core, ramp, emergency exit stairs.
   xiv. Drawing of the roof showing roof-water drainage system, terrace (if any), lift machine room (where applicable), roof of the stair-room, permanent water reservoir at roof (if any) and water outlet.
   xv. Parking plan showing entrance, exit, driveway and parking place and location of security post.
   xvi. Location of the Electrical & Mechanical Room (if applicable), and
   xvii. In the case of a Complex having more than one buildings or installations, entrance for vehicles and pedestrians, places for the passengers to get down from the car and get in the car and movement of vehicles.

m. At least two sections (lengthwise and crosswise) shall have to be made with the measurements of important parts following the scale 1 : 100, of which at least one section must cut the stair-room and in the diagram of cutting the following matters must be shown :
   i. Height of each floor including the mezzanine floor (where applicable), Loft, Water Reservoir at the top (if any), Lift Machine Room (if any), height of

Parapet, existing Land, maximum height of the Building with respect to road and footpath.

ii. Measurements of various parts whose external sides are extended from the walls (balcony, sunshed, etc.), and

iii. Existing and proposed levels of floor-surface.

n. Elevation drawings of all the sides of the Building including maximum height of the Building and its important measurements must be made following the scale 1 : 100.

Listing of Forms Related to Construction Permits

Form 301. This is the application submitted by owner and includes the following:

- Name of applicant
- Present address
- Type of use of proposed building
- Details of proposed land with area
- Details of type of use with area
- Measurements of plot in all four sides with location of North, South, East, West in meters
- Total floor area of proposed project
- Number of apartments per floor for residential properties
- Number of floors above plinth
- Basement covered with percentage of land area
- Floor area of different types of use
- Width of adjacent roads in front, rear, left and right side
- Details of existing structure if present
- Set back length in meter on front, rear, left and right side

The backup data including the following:

- Purchase/Gift/Exchange Deed of land
- Allotment Deed, if allotted by Government
- Receipt of payment of required fee
- FAR calculation
- Documents and drawings as per requirement
- Land Town Planning clearance
- Special project clearance, if required
- Indemnity Bond, if required
- Soil test report, if required
- Required plan, elevation, section
- No objection certificate of other departments, if required.

For buildings that are over 33 m in height or larger than 5,000 square meters, clearances from the following agencies are required,

- Department of power division (DPDC) for electrical load requirement
- Water and sewage authority (WASA) for water consumption requirement

- Titas Gas & Transmission authority for gas requirement
- Fire service for fire safety drawing clearance
- Civil aviation for building height permission
- Dhaka Traffic Control Authority
- Dhaka City Corporation
- Department of Environment
- DCC Ward Commissioner
- Dhaka Metropolitan Police (DMP)

Architectural drawings, including the floor area ratio (FAR) calculation, elevations, sections, floor plan of basement, main floor, and roof plan, are submitted and reviewed. Structural drawings are not submitted until the end of the project. Structural drawings are currently not reviewed.

Form 302. This is sent by RAJUK to the client authorizing construction. The form provides a list of requirements to be adhered to during construction, including safety.

Form 307. This is a form submitted by the owner 15 days prior to construction to inform RAJUK on construction commencement. RAJUK's inspector visits the site to conduct a survey to verify information provided during initial application submission.

Form 309. This form is submitted after finishing plinth (construction up to ground floor). RAJUK inspectors visits the site to observe whether there are deviations. The plinth must be completed within 3 years of obtaining construction permit. If this timeframe is exceeded, the process starts over, and the owner is required to submit Form 301 and obtain a construction permit. The inspector checks setbacks, but RAJUK does not have foundation plan. Inspector measures floors, counts columns, and verifies overall configuration.

Form 310. This form is sent after first elevated floor has been completed. Inspector measures floor and checks floor slab areas, setbacks and whether any floors are cantilevered beyond the building. The Building Construction Act does not explicitly authorize the inspector to check structural or material quality. However, the Authorized Officer has the ability to set conditions on the permit. If these conditions included compliance with the BNBC, then inspectors would have authority to make these checks.

Ad hoc, periodic inspections may take place during construction, although this does not always occur. Development Control's construction monitoring processes are further described below under the Construction Monitoring section.

Form 401. This is the final form which declares that construction is complete, and a request is made for certificate of occupancy. As we understand, there is currently no final inspection made prior to issuing certificate of occupancy, if no deviations were observed by inspectors during constriction and Form 401 is filed.