INCEPTION REPORT

Development of Risk Sensitive Land Use Planning Practice In Greater Dhaka

Prepared by:

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Prepared for:

Rajdhani Unnayan Kartripakkha

(URP/RAJUK/S-05) | DHAKA | BANGLADESH | DEC, 2018

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Document Version

Document	*Final Inception Report*
Ref	*Contract No. URP/RAJUK/S-05; Credit No.: 55990*
Date	*20 December 2018*
Prepared by	***NKY-PROTEK-SHELTECH JV***

Subject: **Submission of Inception Report for the "Contract No. URP/RAJUK/S-5; Consultancy Services for Development of Risk Sensitive Land Use Planning Practice in Greater Dhaka".**

Revision History

Revision #	Revision Date	Details	Authorized Person
1	20-Jan-19	final for approval	NKY PROTEK SHELTECH JV

URP/RAJUK/S-05

December 17, 2018

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Dear Mr. Abdul Latif Helaly:

Reference to signed contract between Project Director, Urban Resiliency Project, RAJUK and Joint Venture of NKY-PROTEK YAPI-SHELTECH herein we are submitting our Inception Report for Contract No. URP/RAJUK/S-5; Consultancy Services for Development of Risk Sensitive Land Use Planning Practice in Greater Dhaka" stating the principles of the assignments to be carried out under the scope of the project along with the updated Work Plan and way forward activities.

We appreciate your acceptance of this report.

Very truly yours,
****
On Behalf of NKY-PROTEK-SHELTECH JV
UĞURHAN AKYÜZ
Team Leader/S5
****

JV of NKY-ProtekYapi-Sheltech

Executive Summary

Land use planning as a decision-making tool creates an enabling environment for sustainable development of land resources which meets people's needs and demands. Conventional land use planning in Bangladesh does not include natural hazards as a factor when determining appropriate allocation of land uses and related policy for the management of land resources. Approximately 80% of the country consists of flood plains and wetlands subjected to regular flooding, intense cyclonic activity along the coasts, heavy rainfall during the monsoon periods and seismic activity. Therefore, Bangladesh experiences regular disasters related to diverse natural hazards.

Considering the disastrous effects of these hazards, it is essential to integrate a land use planning accounts for natural hazards and becomes 'risk-sensitive'. Such a goal is supported by the Bangladesh Sixth Five Year Plan (2011-2015) which emphasizes the need for disaster preparedness, the usefulness of vulnerability and risk assessments, including hazard and risk mapping, and the effectiveness of reducing disaster risk through risk-sensitive land use planning.

This inception report outlines the project structure and methodology of the World Bank financed "RAJUK/URP/S-05: "Development of Risk-Sensitive Land Use Planning in Dhaka" project. With this report, we highlight the inception phase activities and outcomes. Additionally, series of stakeholder meetings have been held focusing group discussions. Key findings from the inception phase, such as the immediate and sustained need for stakeholder and consultant coordination and training platforms, were noted and incorporated into the project plan.

1. Introduction

Risk-sensitive land use planning (RSLUP) adds two new considerations to the conventional approach to land use planning:

Disaster risk reduction parameters and objectives: Hazard, vulnerability, risk, and capacity parameters, together with the disaster/emergency management requirements, are identified, collected, and integrated with traditional land use planning information (e.g., socioeconomic profiles, demographics, and transport networks), and DRR goals and objectives are formulated.

Integration through formal government activities: Measures are taken to ensure understanding, acceptance, and support for the plan; to improve the competency and knowledge about risk-sensitive land use planning among planners and other professionals, and to raise the awareness and support of all stakeholders.

These two additional considerations require the analysis, review, and evaluation of information gathered from government, the targeted communities, non-government organizations and the private sector, which are then incorporated as the plan is formulated.

Risk-sensitive land use planning recognizes that land use and disaster risk are related elements whose interactions need to be considered to determine the most appropriate and safest strategies for development. City-level land use planning and management can therefore serve as effective tools for mainstreaming disaster risk reduction into urban development processes.

By reducing disaster risk through land use planning, cities are able to:

- Promote controlled and sustainable urban growth without generating new risks;
- Identify and mitigate the root causes of disaster risks embedded in existing land development practices;
- Modify and reduce vulnerable conditions of people (physical/social/economic) and places;
- Pre-empt disaster damage before it happens through mitigation; and
- Reduce losses and increase people's ability to recover by speeding up the process of reconstruction and rehabilitation.

The objectives of risk-sensitive land use planning under our scope is designed to be achieved by applying interventions from three basic groups of instruments - policy; capacity development, particularly at the local level; and investment - to support enhanced risk assessment, risk reduction, and management of residual risk.

1.1. Background

In many countries there is often a lack of the supporting national and subnational policies and frameworks that can leverage the urbanization process for increased development gains and guide it towards sustainable patterns. Governments and other stakeholders may have inadequate capacity, institutional coordination and the specialized skills to be able successfully to undertake this process independent of outside guidance. Additionally, governments often lack the data, knowledge, and tools needed to develop complex policies and plans like a National Urban Plans and Policies.

With National Urban Policy having been recognized internationally as a tool for the implementation and monitoring of global urban agendas, such as the New Urban Agenda, Paris Agreement and Sendai Framework, this project of the RSLUP is particularly timely. Also, the New Urban Agenda proposes a smart city approach for environmentally sustainable and resilient urban development.

"We commit to adopt a smart city approach, which makes use of opportunities from digitalization, clean energy and technologies, as well as innovative transport technologies, thus providing options for inhabitants to make more environmentally friendly choices and boost sustainable economic growth and enabling cities to improve their service delivery." (New Urban Agenda, 2016: 66)

The main challenges of urban planning system in Dhaka could be summarized as:

- Lack of communication and inconsistency between the national level and the local level,
- Absence of integrated planning in the urban management system,
- Centralized and hierarchic administrative system of Bangladesh,
- Poor appreciation of the concerns and interests of stakeholders, beneficiaries and related end users,
- Lack of public participation in urban planning,
- Inefficiency of some urban planning laws, rules and regulations,
- Lack of inter organizational relationship,
- Expansion of urban areas and facing urban sprawl and informal settlements issues,

The Global Earthquake Disaster Risk Index has placed Dhaka among the 20 most vulnerable cities in the world. According to the Comprehensive Disaster Management Program's (CDMP) recent studies, Dhaka, Sylhet and Chittagong are the cities with the highest vulnerability to earthquake risk. Apart from earthquakes, incidences of urban disasters like the 2013 Rana Plaza collapse where 1,132 people were killed and the 2005 Spectrum Building collapse where 100 people died have raised alarming concerns about the lack of preparedness as well as capability of Bangladesh to handle urban disasters effectively.

Furthermore, the building construction in Bangladesh is highly vulnerable because of rapid urbanization, lack of construction control and ethics. This is somewhat validated by more scientific risk studies, such as the micro-zonation study for Dhaka that was undertaken by CDMP2. This argument is strengthened by the rapid urbanization that the city is experiencing, which is quickly encroaching upon open space and increasing population density. Systems and processes for quality control of construction and adherence to building code provisions and other standards are believed to be insufficient. The rapid growth of Dhaka coupled with migration has increased its vulnerability to earthquakes and other hazards. The trend of increased vulnerability can be reserved into urban resilience and sustainability by implementing risk-sensitive planning and sustainable development policies and strategies.

1.2. Project Situation

In recent years, Bangladesh has reformed its approach to cyclone and flood risk management and preparedness. Triggered by major loss of life and assets, notably during the cyclones of 1970 and 1991 that killed over 300,000 and 140,000 people respectively, the Government of Bangladesh (GoB), civil society, and international development partners have demonstrated that investment in the systems and structures of flood risk management and cyclone preparedness saves lives, reduces economic loss, and protects development gains. As such, Bangladesh is cited often in the rationale for investment in disaster risk management (DRM) activities globally.

Bangladesh Urban Earthquake Resilience Project (UERP) evaluated the existing planning policies, systems and plans under RAJUK. It provided input and detailed guidance on how future plans can be made "risk-sensitive" and how mainstreaming can be incorporated in the land use management approaches and various sectors of development embedded in the plan. The findings and guidelines were summarized in the Guidebook for Risk-Sensitive Land Use Planning of Dhaka produced as an output of Bangladesh UERP. An introductory training on risk-sensitive land use planning was developed and completed for about 35 planners and engineers as explained in the RSLUP Guidebook.

At the same time, significant hazard, vulnerability and risk assessment data and output has been produced by the Comprehensive Disaster Management Program (CDMP) and the Bangladesh UERP. A Dhaka City Profile and Earthquake Risk Atlas publication was produced by Bangladesh UERP Phase 1 and has been widely distributed among government agencies and other stakeholders in Dhaka.

The Government of Bangladesh (GoB) requested a support program on earthquake risk mitigation. The Global Facility for Disaster Reduction and Recovery (GFDRR) of the World Bank has provided funds to undertake Technical Assistance projects entitled "Bangladesh Urban Earthquake Resilience Project (BUERP): Phase 1 (2012-2014) and Phase 2 (2014-2015)". BUERP Phase 1 has already accomplished its primary goals and objectives and its final deliverables are: a) Dhaka Profile and Earthquake Risk Atlas; b) Risk Sensitive Land-use Planning (RSLUP) Guidebook; c) Dhaka Earthquake Risk Guide Book; d) Legal

and Institutional Arrangements (LIA) Framework Guide Book; e) Roadmap for Disaster Data Sharing Platform; f) Information, Education and Communication Action Plan; and g) Training and Capacity Building Action Plan.

To comprehensively address urban resilience in Dhaka, a long term three phased investment program is proposed, incorporating each core pillar in each subsequent investment. The proposed "Urban Resilience Project (URP)" would serve as the first of these suggested investments and will focus on improving the critical capacity and infrastructure for emergency planning and response. The proposed project will also lay the foundations for subsequent investment projects by identifying and addressing existing risks in the built environment, and fostering a culture of risk-sensitive urban development.

The People's Republic of Bangladesh has received a credit from the International Development Association (The World Bank) in the amount of US$173.00 million equivalent towards the cost of the Urban Resilience Project (URP) and it intends to apply part of the proceeds of this credit towards payment under the contracts of Consultancy Services for Vulnerability Assessment and Prioritized Investment Plan for critical assets in Dhaka" that represents the second phase of a multi-phase national DRM program to build institutional capacity to mitigate the impact of earthquakes in the rapidly urbanizing cities of Bangladesh.

The Bank along with the Government intends to initiate studies for urban resilience, reducing risk in the built environment of Dhaka and dissemination of the public risk reduction and retrofitting program for selected high risky areas throughout the country. The activities will be executed implemented in close coordination with RAJUK which will provide input and actively participate in technical aspects of the study, providing data and guidance to the consultants, review of reports and utilization of methods developed as an outcome of this study. To respond to this critical gap in the management of disaster risk in Bangladesh, this project represents the second phase of a multi-phase national DRM program to build institutional capacity to mitigate the impact of earthquakes, cyclone and floods in the rapidly urbanizing cities of Bangladesh.

1.3. Key Objectives

The objective is to review, enrich and strengthen the current planning regulation, process, and methods of RAJUK, to ensure that DSP (2016-2035) and DAPs are risk-sensitive and to improve ownership for consultation, learning and consensus building within RAJUK and other agencies involved in the land-use planning process of Dhaka (e.g., DCCs, DWASA, TITAS GAS, and others). The engagement shall design and propose a land use planning investigation process and procedures that shifts towards risk-sensitive planning, investment programming and implementation. This requires designing procedures, indicators and criteria on how to assess and improve current town- planning structures, practice and processes. The engagement shall look into the planning process and identify key entry points of DRM mainstreaming in the plan formulation, in investment programming and implementation.

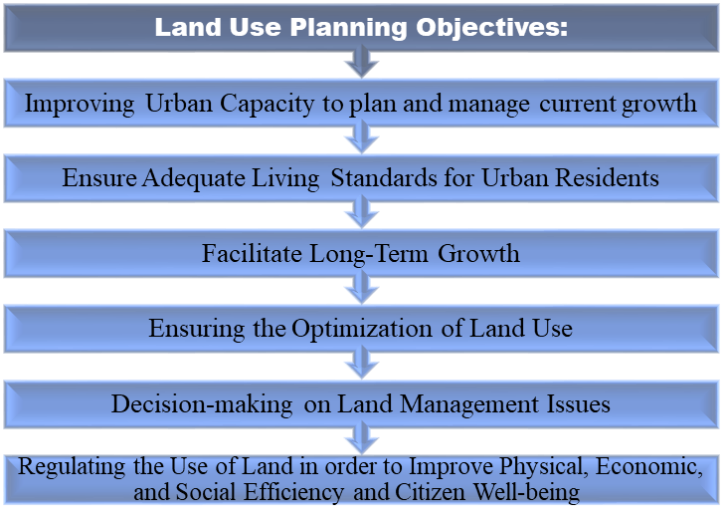
The engagement includes developing and training RAJUK's town-planning professionals and related specialists on a well-illustrated and structured step-by–step approach on how to utilize technical assessments, interpret results and integrate disaster risk reduction parameters and objectives into Metro-Dhaka City's land use plans, Detailed Area Plans, Zoning Provisions and the decision making processes involved in the development and implementation of land use and construction control regulation.

Mainstreaming Disaster Risk Reduction into Land Use Planning for Dhaka to promote the establishment of a common land use planning process at local level, as well as promote the use of disaster risk information and disaster risk reduction strategies at planning level.

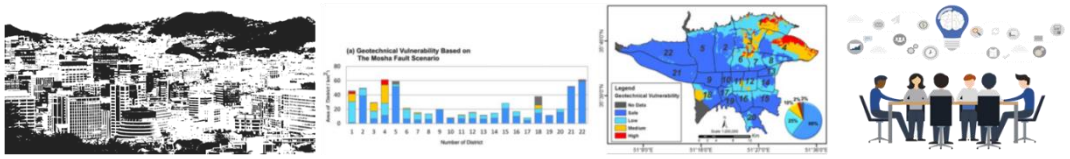
Specifically, the objectives of this project are:

- Provide an enhanced, systematic and standardized LUP
- Integrate DRR into LUP preparation
- Ensure that DSP (2016-2035) and DAP's are risk-sensitive
- Improve ownership for consultation, learning and consensus building within RAJUK and other agencies involved in the land-use planning process of Dhaka

- Propose a land use planning investigation process and procedures that shifts towards risk-sensitive planning, investment programming and implementation



SUSTAINABILITY IN PLANNING BY CONSENSUS & TRAINING

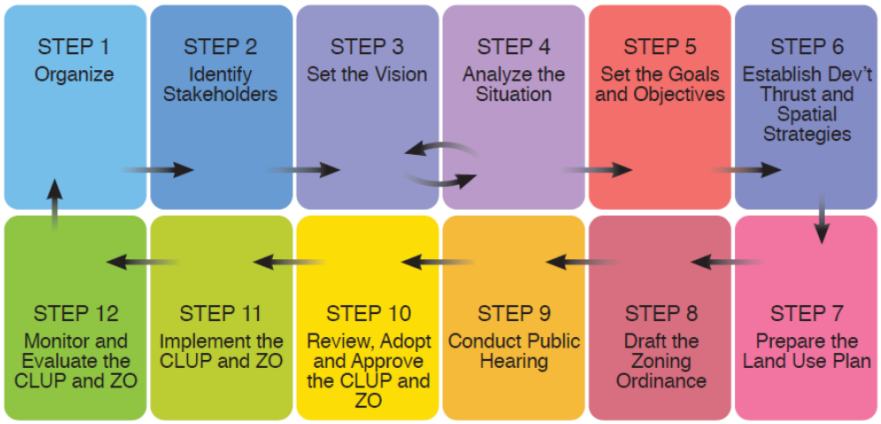


Main Objective: To review, enrich and strengthen planning regulation, processes & methods of RAJUK and achieve sustainability in risk sensitive land use planning through consensus and training

Major Outputs: Seismic Hazard & Risk Mapping, Dhaka Risk Sensitive Land Use Strategy

1.4. Scope of Work and Justification

The steps in doing risk sensitive land use planning can be arranged as following:



This translates into a new framework for a national integrated plan that includes:

1. Risk-sensitive land use planning from their formulation, implementation and enforcement perspective;
2. Mainstreaming risk management and reduction parameters and objectives in land use plans from their formulation to their implementation and enforcement;
3. Identifying and quantifying natural hazards (e.g., flood, earthquake, extreme winds, etc.) and related risk parameters in the planning methodology;
4. Formulate a vision for a disaster resilient city and develop a risk profile and disaster risk reduction objectives;
5. Reaching consensus with stakeholders on planning criteria and zoning requirements derived from the RSLUP process; and
6. Embarked on efforts to prepare and enforce risk sensitive land use plans in Bangladesh to reach a planning that integrates risk reduction, to allow communities to find the right mix of both development and risk reduction,

In particular, the JV will be responsible for:

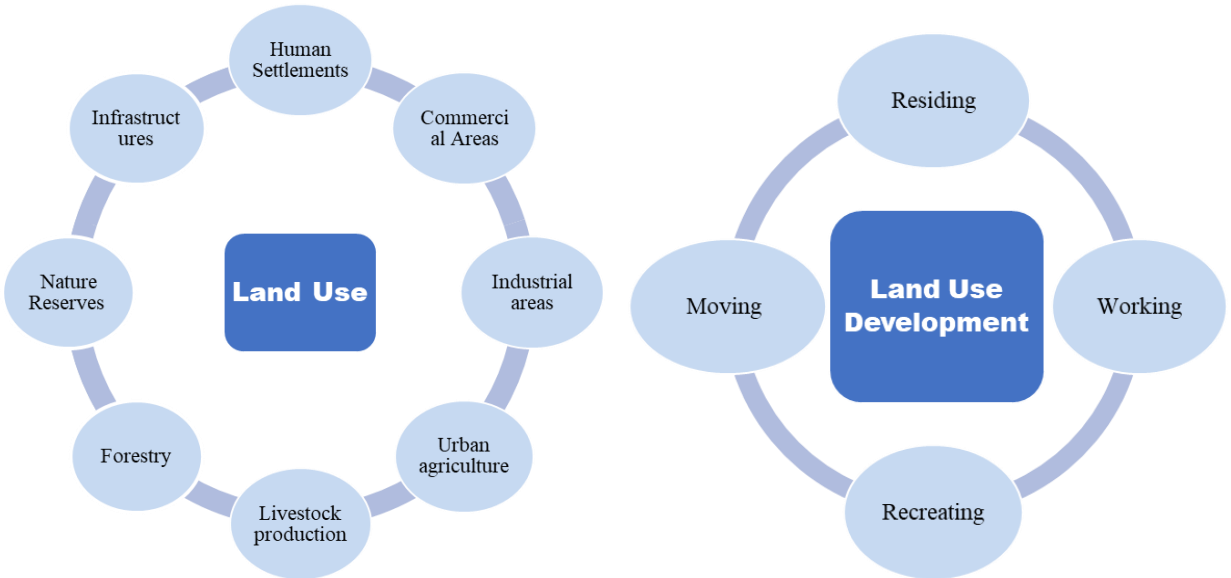
1. Mainstreaming DRM and RSLUP concepts;
2. RSLUP Framework and Process;
3. 3. Methodology for analyzing the risk-sensitivity of a land use plan,
4. 4. Conducting risk-sensitive land use planning investigations; and 5) Dhaka City case results.

The scope of the services has been identified as following;

- Stage 1: Project Organization, Data Collection, and Situation Analysis
- Stage 2: Development of the internal guidelines and processes for RSLUP to upgrade/reform the current planning system
- Stage 3: Training and Capacity Building for risk-sensitive planning

1.5. Land Use in Bangladesh

The spatial location of functions and activities is called “Land use”.



1.5.1 Land Use Planning Factors

Physical Factors

- Topography of the Land
- Soil Quality
- Sub-Surface Soil Condition
- The Micro-Climate Situation
- Climate Change Factors

Economic Factors

- Land Costs
- Land Activities Costs
- Proximity to Markets
- Economic Development Objectives

Social Factors

- Land Tenure Rights and Regulations
- Inheritance Practices
- Tradition
- Labor Patterns and Costs
- Governmental Systems
- Cultural Perspectives on Land and Nature

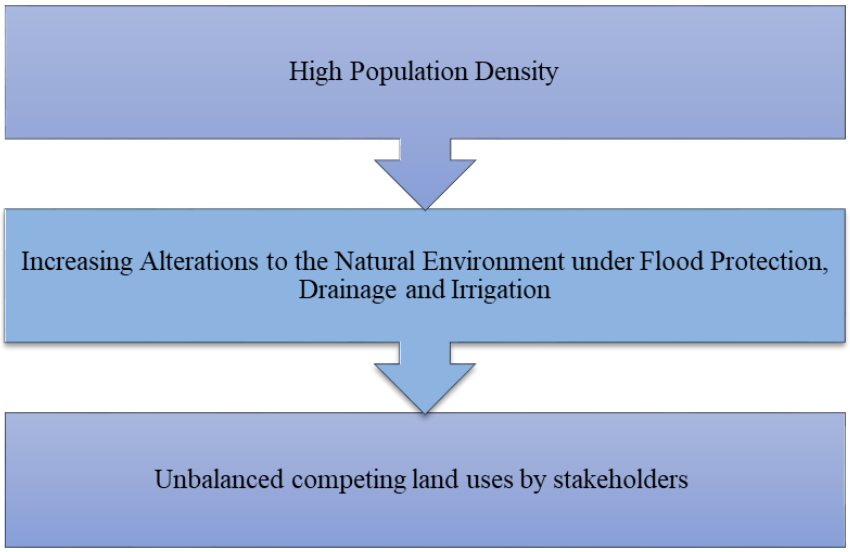
Physical Factors

- High Population Density
- Increasing Alterations to the Natural Environment under Flood Protection, Drainage and Irrigation
- Primary Land Uses in Bangladesh are Agriculture, Forestry, Human Settlements and Water Bodies.

The United Nations Defines Land Use Planning as the:

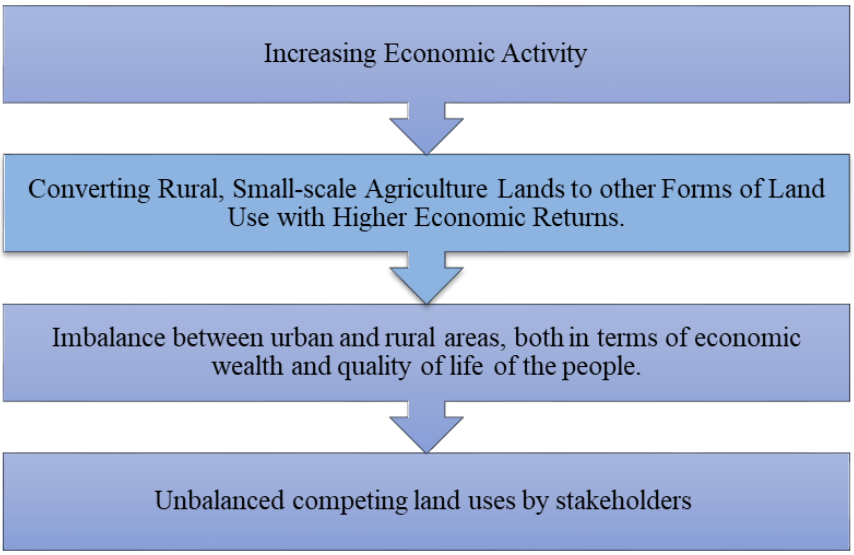
"*Systematic and iterative procedure carried out in order to create an enabling environment for sustainable development of land resources which meets people's needs and demands. It assesses the physical, socio-economic, institutional and legal potentials and constraints with respect to an optimal and sustainable use of land resources, and empowers people to make decisions about how to allocate those resources.* (FAO and UNEP, 1999)"

1.5.2 Physical of Land Use in Bangladesh:

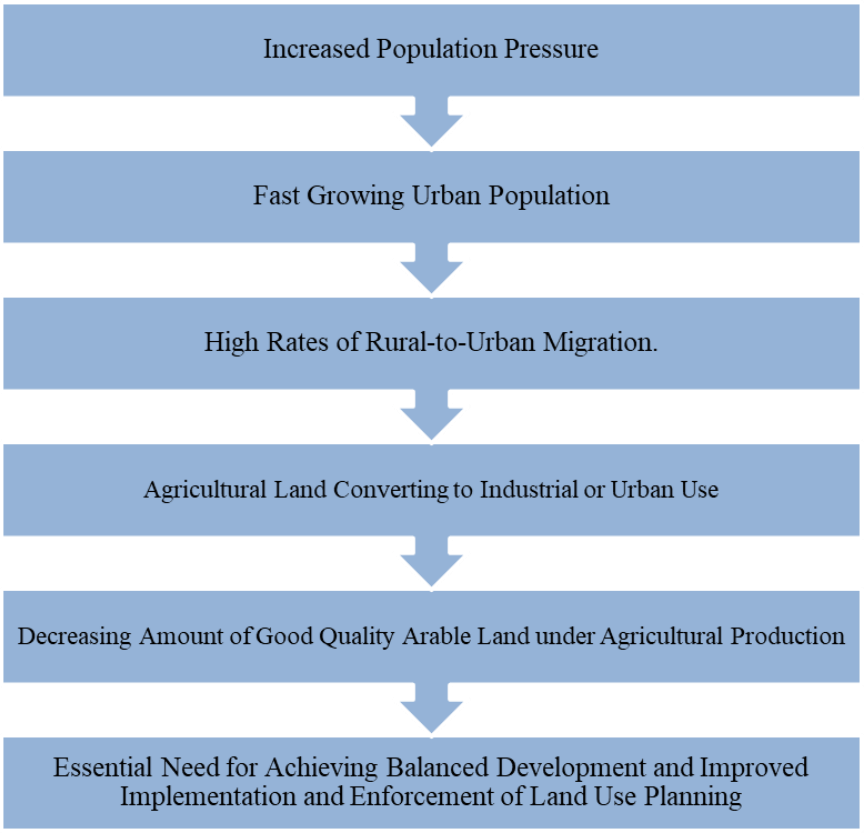


Area distribution of different land categories in Bangladesh		
Land Use Category	Area (million hectare)	Percentage (%)
Agriculture	9.57	64.9
State Forest		
Classified	1.52	10.3
Unclassified	0.73	5
Private Forest		
Homestead	0.27	1.8
Tea/Rebar Garden	0.07	0.5
Urban	1.16	7.9
Water	0.94	6.4
Other	0.49	3.2
Total	14.75	100
Source: Dey, N., et al. (2012). "*Assessing Land-use Change and Land Degradation in Bangladesh*"		

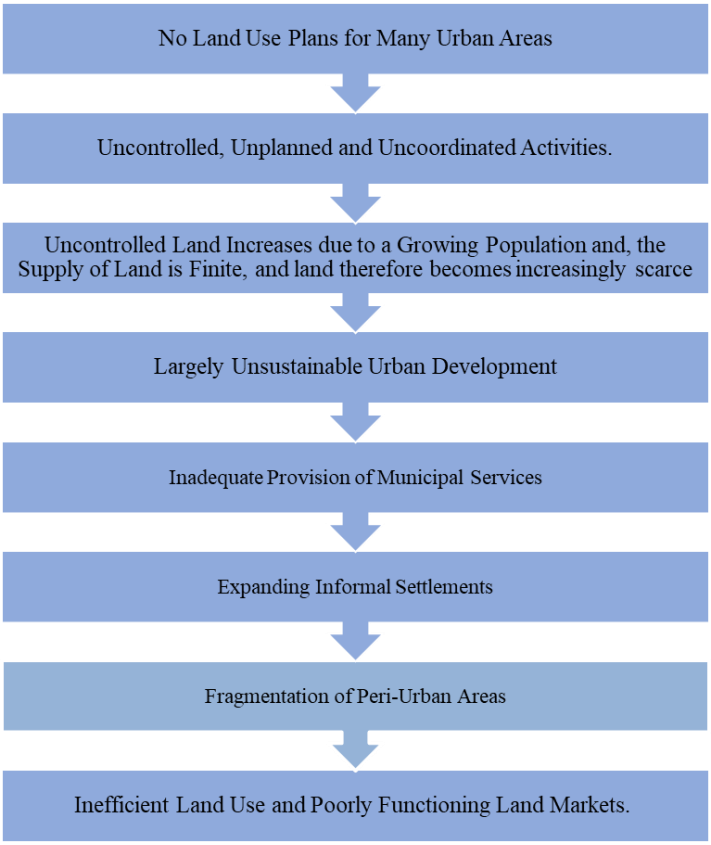
1.5.3 Economic Factors of Land Use in Bangladesh



1.5.4 Social Factors of Land Use in Bangladesh:



1.6. Land Use Planning in Bangladesh



1.7. Major Hazards and Disasters in Bangladesh

Natural hazards are natural phenomena which have the potentiality to cause loss of life or damage to property.

Summary of different types of hazards in Bangladesh		
Natural hazard type	Examples	
Geophysical hazards	• Earthquakes • Tsunami • Land Subsidence	• Riverbank Erosion • Mass Movement (Dry) • Coastal Erosion
Hydro-meteorological hazards	• Flood • Cyclone • Tornadoes • Extreme Temperature	• Salinity intrusion (Coastal Areas) • Storms and Storm Surge • Heavy Rains • Drought
Source: (2011). State of the Environment, (Government of Bangladesh, Dhaka).		

1.7.1 Hydro-Meteorological Hazards

Overview of hydro-meteorological hazards in Bangladesh			
Hazard	Key Causes	Season	Potential impact
Flood	• Excessive Rainfall • Excessive Water From Glacier Melt • Inadequate Infrastructure • Inadequate Drainage • Silted Rivers • deforestation	Monsoon	• Lose Agriculture • Disrupt Communication Systems • Disrupt Livelihoods • Disrupt Essential Services • Lose Human Lives • Damage Property • Lose Biodiversity • Degrade Environments • Destroy Cash Crops • Stress National Economy • Disrupt Life Styles • Reduce Fresh Water Fish Production
Cyclone	• Intense Sea-Surface Heating (Bay of Bengal) • Low Moisture Incursion • Coastal Configuration	Pre and Post Monsoon	
Drought	• Reduced Rainfall • Non-Availability of Surface Water • Deforestation • Over-Farming • Excessive Irrigation	Dry Season	
Source: (2011). State of the Environment, (*Government of Bangladesh, Dhaka*).			

Flood Hazard:

- Vast Amount of Water Flows by Three Major Rivers Forming the Largest River Delta in the World
- Rapid Torrential Rains during the Monsoon
- About 75% of the Country is less than 10 Meters above Sea Level and 80% is Flood Plain.
- Normally occurs during the Monsoon Season (June to September).
- An average of 18% of the country is flooded and once every three to five years, up to two-thirds of Bangladesh is flooded.
- Widespread Location of Villages, Towns and Settlements in Floodplains, and Flood-prone areas, as well as Poor Quality Construction
- Insufficient and Inefficient Drainage Systems, and Heavily Silted Rivers and Canals.
- Recurring Floods due to High Rainfall in the Catchment Areas of the Rivers during the Monsoon.
- High Discharge Levels in the Rivers which Overflow their Banks to Flood Surrounding Areas.
- Widespread Damage to Human Settlements, Infrastructure, Crops and Ecosystems.

Cyclone Hazard:

- Destruction of Houses, Infrastructure, Crops and Forests especially in the Southern Areas of the Country.
- 250,000 Fatalities due to Cyclones in Bangladesh over (1980-2010).
- Increasing Activity over Recent Years
- Considerable Improvements in Cyclone Response

Drought Hazard:

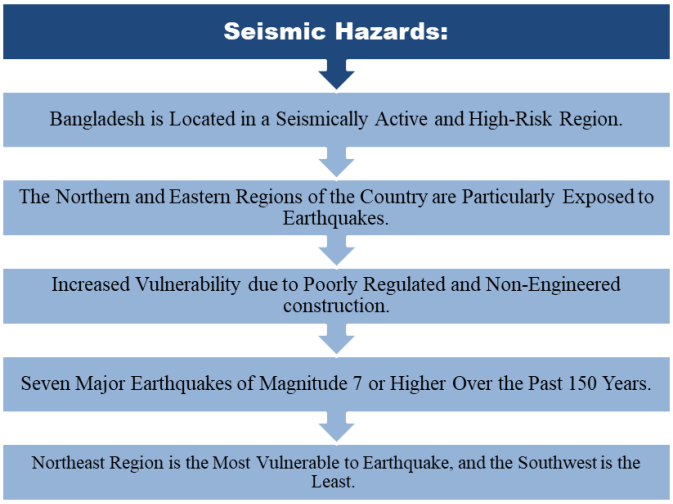
- Commonly Affect the Northwestern Region, as it Receives Lower Rainfall than the Rest of the Country.
- Devastating Impact on Crops
- Affect the Food Security of Subsistence Farmers.

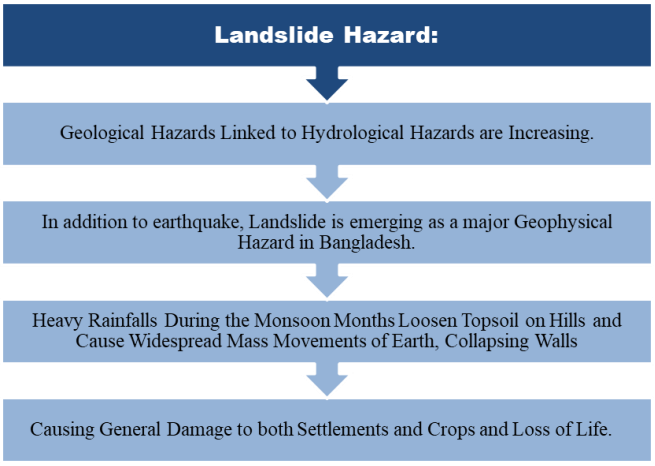
Climate Change Hazard:

- Increase the Frequency, Intensity and Duration of Extreme Events
- High and More Intense Torrential Rainfall during the Monsoon Period
- Increased Stress on Already Overworked Drainage and Flood Management Systems.
- Increased Drought in many Areas of the Country.
- Mean Sea Level Rising
- Increase in Storm Surges over the Upcoming Years as Mean Sea Level Continues to Rise.
- Threaten Coastal Crops and Settlements.

1.7.2 Geological Hazards

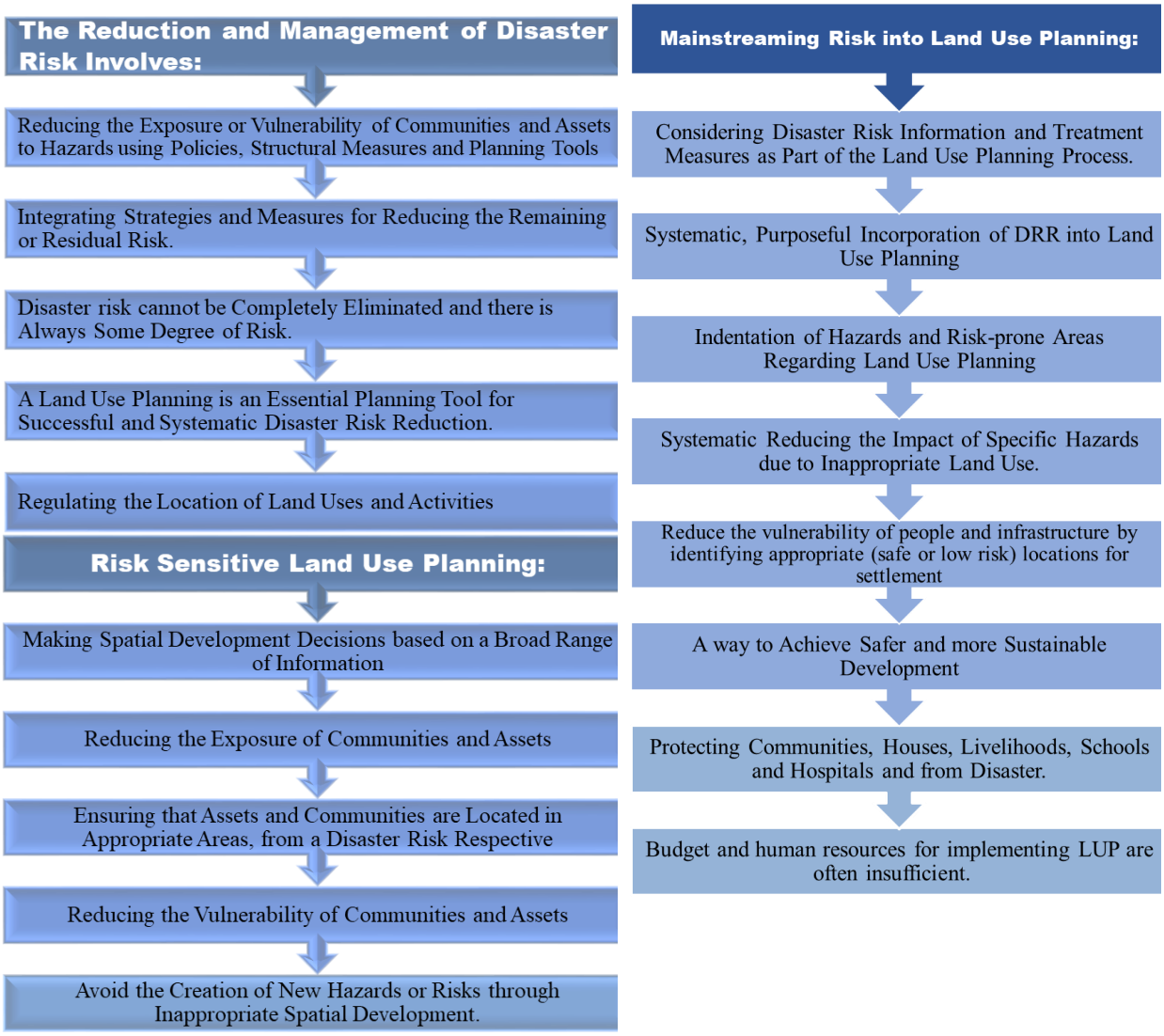
Overview of Geological Hazards in Bangladesh		
Hazard	Key Causes	Potential Impact
Earthquake	• Major Fault Lines • Moderate Fault Lines	• Destroy settlements • Destroy infrastructure • Lose human life • Disrupt basic services and utilities • Reduce area of arable land
Landslide	• Heavy Rains • Unstable Slopes • Hill Cutting • Deforestation of Slopes	
Erosion (River Banks)	• High River Discharge Rates • Deforestation of Banks • Sediment Deposition on River Bed • Storm Surge and Sea Current	
Source: (2011). State of the Environment, (*Government of Bangladesh, Dhaka*).		





1.8. Mainstreaming Disaster Risk Reduction into Land Use Planning

Given these recurring heavy losses, Bangladesh needs to systematically strengthen its tools and instruments for reducing the potentiality of such losses in future. However, current land use planning practice in Bangladesh does not systematically consider natural hazards or disaster risk.



2. Project Implementation

2.1. Team Organization and Key Staff

Our Joint Venture consists of the firms of NKY Architectural and Engineering Co., Sheltech Co. and Protek Yapi Engineering Co., with sub-consultant SDE in the future referred to as the Consultant. Our Team proposes to carry out all necessary services and to successfully complete all the works specified in TOR. We will also utilize the experience and knowledge of the Consultant to assist in the successful completion of the Development of Risk Sensitive Land Use Planning Practice in Metro Dhaka within the given timeframe and budget.

It has imperative importance to mention that International expert team such as Yanev Associates, EQRM has agreed and will be as well working with the team as sub-consultant in case of the contract award where will be responsible for carrying out the land use plans and development of the part of the of the internal guidelines and processes for RSLUP to upgrade/reform the current planning system.

More importantly out Joint venture is planning to bring very high expert scientists from all around the world and in particular from BUET University and Bosporus University Dhaka (Prof. Dr. Msutafa Erdik) as technical approval for the project.

We have established an office in Dhaka however Sheltech as local partner where their office premises in Dhaka will as well be used to carry out the tasks. Moreover, the HQ of NKY and Protek in Turkey will always support the activities in real-time by providing special software for communicating.

The joined further consultants include a core team as well as both national and international support staff. The team has been assembled to include advisory, technical, and engagement experts to ensure that URU design, outreach and development is carried out in an inclusive, participatory and efficient manner. Team members and informants are listed in the following table.

2.1.1 Key Experts

No	Name	Position (Key-Experts)	Location	(%)
K-1	UGURHAN AKYUZ	Team Leader (International)	Home	-
			Field	100.00%
K-2	SARWAR JAHAN	Project Manager (National/International)	Home	-
			Field	100.00%
K-3	PARVIZ ROOZKHASH	Practice Leader: Geologist (International)	Home	-
			Field	100.00%
K-4	FARZIN FARDANESH	Practice Leader: Risk Sensitive Land Use Planner (International)	Home	-
			Field	100.00%
K-5	AKHTER HUSAIN CHAUDHURY	Practice Leader: Urban Planner and Designer (National)	Home	-
			Field	100.00%
K-6	RAFAEL ALALUF	Practice Leader: Urban Hazard, Vulnerability and Risk Expert (International)	Home	-
			Field	100.00%
K-7	SHEIKH TAWHIDUL ISLAM	Practice Leader: GIS Modeling Specialist (National)	Home	-
			Field	100.00%
K-8	SHAMAUN AL NOOR	Practice Leader: GIS Modeling Specialist (National)	Home	-
			Field	100.00%
K-9	MIR FAZLUL KARIM	Geotechnical Expert-1: (International)	Home	-
			Field	100.00%
K-10	MD. SAHAHIN HOSSAIN	Geotechnical Expert-2: (National)	Home	-
			Field	100.00%
K-11	ELCIN KENTEL	Practice Leader: Environmental Expert (International)	Home	-
			Field	100.00%

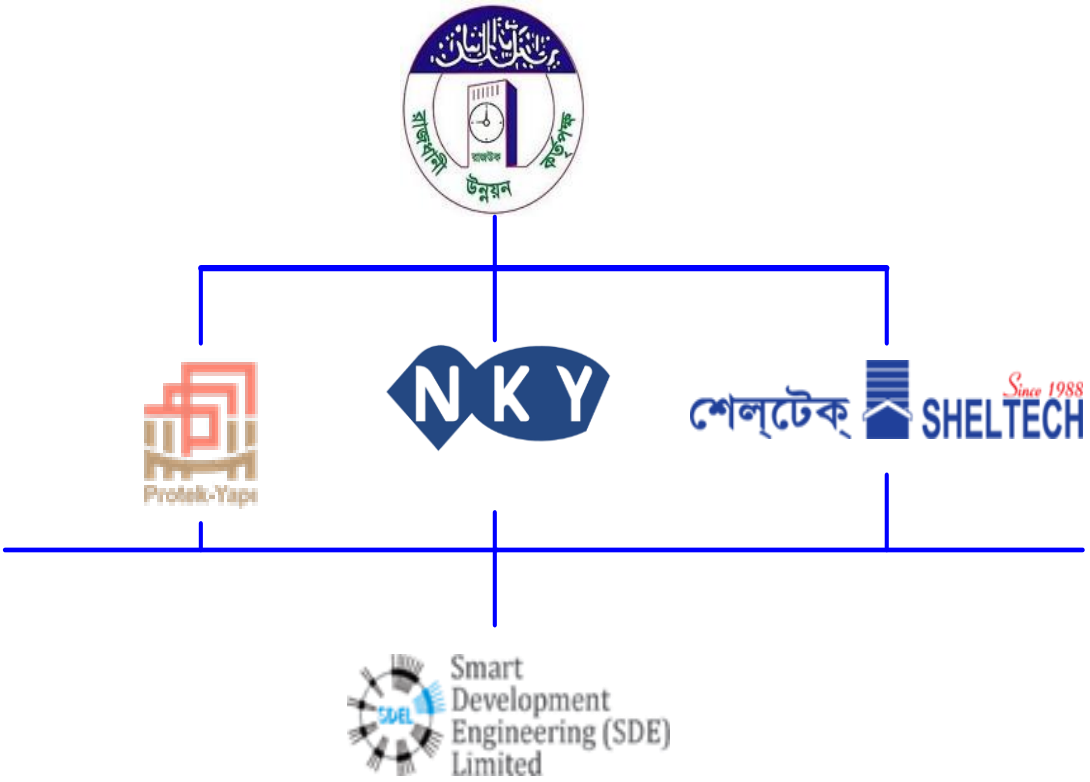
2.1.2 Non-Key Experts

No	Name	Position (Key-Experts)	Location	(%)
N-1	MOHAMMAD ABDUL MOHIT	Practice Leader: Urban Management and Development Control (International)	Home	-
			Field	100.00%
N-2	ZEENAT NAHREEN	Practice Leader: Urban Management and Development Control (National)	Home	-
			Field	100.00%
N-3	SHARMIN REZA CHOWDHURY	Geotechnical Expert: Studies Expert #01 (National)	Home	-
			Field	100.00%
N-4	ARMAN ALI BHULYAN	Geotechnical Expert: Studies Expert #02 (National)	Home	-
			Field	100.00%
N-5	ILYAS YILMAZER	Geotechnical Expert: Studies Expert #03 (International)	Home	-
			Field	100.00%
N-6	SIAVASH KHOSHNEVIS	Surveyor Expert (International)	Home	-
			Field	100.00%

2.1.3 Core Team

No	Name	Position (Key-Experts)	Location	(%)
C-1	SADETTIN SEZER	Team Leader (International)	Home	
			Field	100.00%
C-2	SARWAR JAHAN	Project Manager (National/International)	Home	
			Field	100.00%
C-3	PARVIZ ROOZKHASH	Practice Leader: Geologist (International)	Home	
			Field	100.00%
C-4	FARZIN FARDANESH	Practice Leader: Risk Sensitive Land Use Planner (International)	Home	
			Field	100.00%
C-5	AKHTER HUSAIN CHAUDHURY	Practice leader: Urban Planner and Designer (National)	Home	
			Field	100.00%
C-6	RAFAEL ALALUF	Practice Leader: Urban Hazard, Vulnerability and Risk Expert (International)	Home	
			Field	100.00%
C-7	SHEIKH TAWHIDUL ISLAM	Practice Leader: GIS Modeling Specialist (National)	Home	
			Field	100.00%
C-8	SHAMAUN AL NOOR	Practice Leader: GIS Modeling Specialist (National)	Home	
			Field	100.00%

2.2. Project Organizational Chart



2.3. Project Execution, Oversight & Dissemination

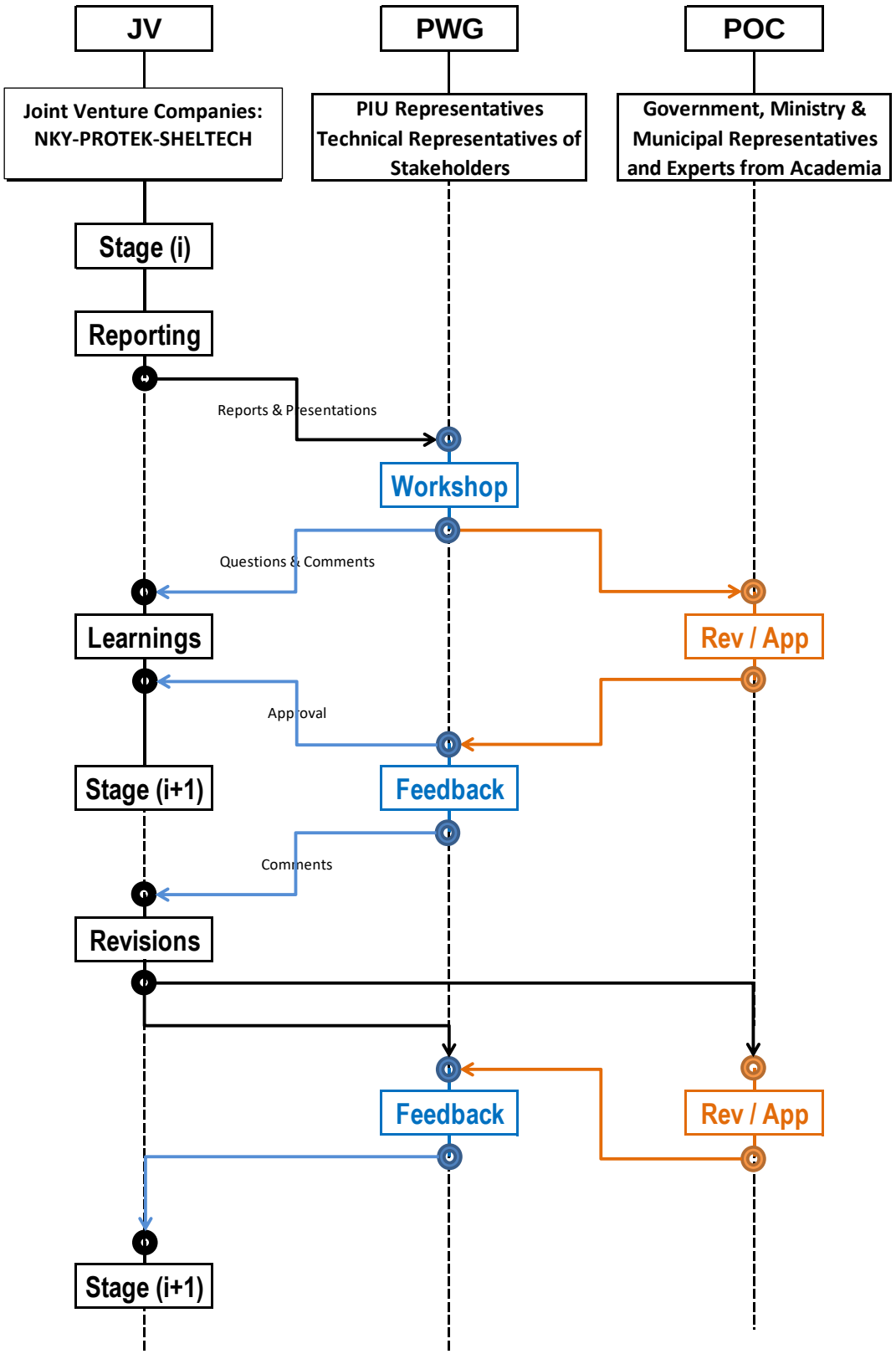
Overall interaction with the stakeholders will be as details of which are noted below.

2.3.1 Project Working Group

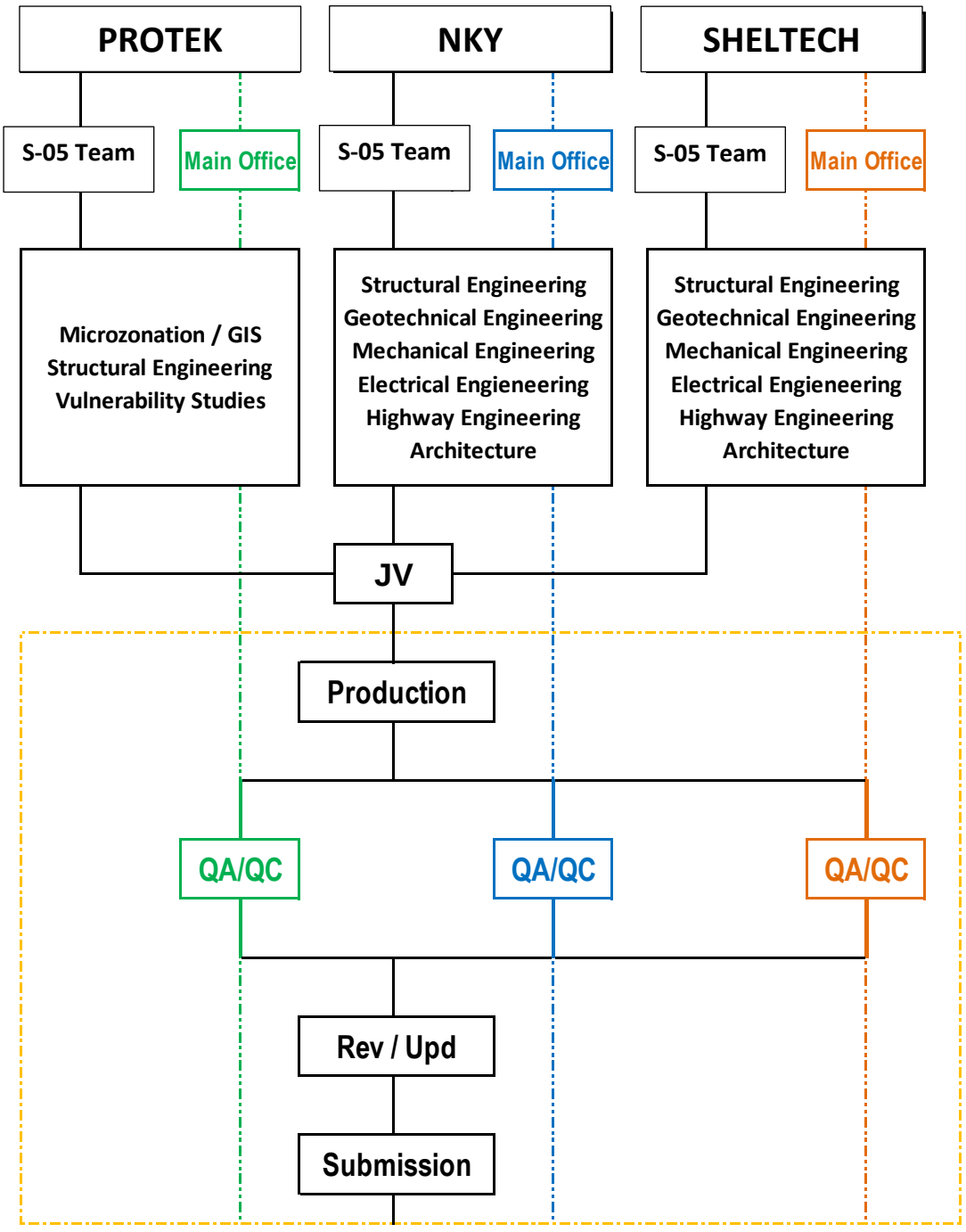
Project Working Group (PWG) will be formed by technical & project management staff of Project Implementation Unit (PIU) and other stakeholder organizations to reflect the past experience from earlier projects and updates on developments from user perspective. We believe that the PWG will play a critical role on dissemination of data and developments across past & current projects, and project technical leadership & stakeholder organizations. Quarterly meeting will be held with PWG in the form of Workshops & Seminars.

2.3.2 Project Oversight Committee

Project Oversight Committee (POC) will be formed from systems managers and decision makers of the stakeholder groups as well as governmental organization representatives of ministry scale. POC's influence within public services organization matrix and leverage on public bodies, will allow rapid acceptance of the project and enable smooth coordination of site contacts, inspections and testing. Quarterly meetings will be held with POC in the form of Seminars & Conferences. These will serve as forums for dissemination of previously completed & approved phases of the projects.



Review and Approval Cycle for the JV-PWG-POC Interaction



Joint Venture Internal Review and QA/QC Coordination

2.3.3 Stakeholder Conferences

PWG & POC Meetings will be used as forums of dissemination and following forms of communication employed;

- **Workshop**: for hands-on discussion of a few topics with PWG and invited experts,
- **Seminar**: for sharing a development on a particular narrow range of topics and broader discussion with stakeholder groups and/or engineering community.
- **Conference**: dissemination of field specific knowledge, recent developments, and collecting technical and non-technical attendee opinion.

It is expected that there will be one of such gatherings on an average interval of 3 months. All these meetings can be complemented with closed sessions for detailed discussions on immediate and detailed issues not developed for standard presentations.

2.3.4 Training & Workshops

There will be standard trainings and refreshers for the JV staff to coordinate the uniform execution of the planned tasks. There will also be dissemination workshops upon close of important project milestones to improve the national technical capability.

2.3.5 Reporting & Publicizing

Reports will be prepared in a unified and structured format which is tailor made for the project by the JV. JV will run its internal quality assurance system to enable high quality of information production. Main offices of JV partners will have the control and maintain the oversight, Figure 1.4. This will off load the site staff from revision works and will provide independent second checking opportunity. Upon internal agreement the data, report and presentations will be issued with the authorized signature of the JV-Leader. As already outlined in Figures above, the report and approval process will involve PWG and POC contributions. Public announcement will be undertaken by PWG upon approval of POC, JV will contribute to the process in sharing data, report and presentation material developed for and during the Stakeholder Conferences

2.4. Project Deliverables

2.4.1 MD - Main Deliverables

Our deliverables have been categorized in 4 main categories. The first category refers to interim deliverables (ID) which are developed for the purpose of internal usage and database development. These interim reports will be part of the Deliverables (D) as Annex and submitted to PIU for their feedback which is the second category. Geotechnical Deliverables (GD) are based on the outcomes of the geotechnical studies conducted for the purposes of Microzonation. The reports and deliverables will be submitted to PIU for Approval and Payment purposes. The forth category of the reporting refers to Main Deliverable (MD) that is linked to Payments. In following tables each category is separately provided. Complete Deliverables and their linkages can be seen in Work Plan.

Tasks and Accomplishments		List of Reports/ Documents to be submitted or approved	Duration
Development of SEA Report for Greater Dhaka Metropolitan Development Plan	**MD1**	**Inception Report including stakeholders analysis and Consultations Participatory Plan**	Jan-19~ Feb-19
		Draft Final, Consultations Report; and Final Report	Jan-19~ Feb-19
Situational Analysis and Diagnosis of the Current Planning and Development Context	**MD2**	**Situation report on the existing planning system, its legislative foundation, process, approach, practice, evolution, implementation, enforcement and outputs and identifying gaps**	Jan-19~ Apr-19
		Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.	Mar-19~ Jun-19
Conduct a comprehensive study to assess implications of hazards, vulnerabilities and risks on the current regional boundary. In particular, assess how hazards, vulnerabilities and risks were considered in the following contexts:	**MD3**	**Submit Geotechnical and Geological Survey plan. Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas**	Mar-19~ Jun-19
		1. Prepare "Preliminary Assessment Report" setting forth the results of the assessment conducted and results achieved.	Mar-19~ Jun-19
		2. Develop a strategic framework based on the results achieved and way forward planning to overcome the shortcomings and how to overcome the possible consequences and risks associated with each critical component identified in the scope of the work	Mar-19~ Jun-19
Conduct a comprehensive study on a city wide geotechnical investigation for the purposes stated above in the scope of work. **Develop a Draft Greater Dhaka Risk Sensitive Land Use Strategy with a vision statement, specific objectives and goals, elaboration of the outputs and outcomes, constraints and resources, risk factors, safeguards, and monitoring and evaluation indicators. The Strategy should be aimed at institutionalizing the proposed mainstreaming framework.**	**MD4**	**5. Draft analysis report of the geotechnical and geological studies conducted with Recommendations as well as Prepare a final comprehensive report on the outcomes of the geotechnical and geological studies reflecting the results and way forward recommendations. This will include the compilation of the Seismic and Hazard Mappings and risk profiles for the greater Dhaka City**	Mar-19~ Jun-20
		3. Submit Geotechnical and Geological Survey plan. Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas	May-20~ Oct-20
		4- Complete and submit the Greater Dhaka Risk Sensitive Land Use Strategy	May-20~ Oct-20
Full documentation and preparation of reports and deliverables.	**MD5**	**1. Final Consultancy Report addressing full documentation**	Jan-19~ Feb-19

2.4.2 GD – Deliverables

Tasks	List of Reports/ Documents to be submitted or approved	Duration
GD1	Conduct detailed geotechnical and geophysical studies of all DMDP area of Dhaka City which information is available in RAJUK website (www.rajukdhaka.gov.bd) for the purpose of microzonation.	Mar-19~ Jun-19
GD2	Conduct detailed Geotechnical Study (including all field and all laboratory tests) by means of Standard Penetration Tests (SPT) (rotary drill with hydraulic arrangement) with Standard Automatic Hammer (ASTM D-1586-84, Hammer: 63.5 kg + 1 kg; Height of fall: 760 mm + 25 mm, collecting and necessary testing of samples in numbers as required (preferably at the interval of 1500 mm) for stratification of layers, physical parameters of soils like Atterberg's limits, Specific gravity, Grain size distribution (by weight sieve, Hydrometer), shrinkage & swelling, consolidation; Shear Test, Triaxial Shear Test, Unconfined compression test, and entering all these information in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 15,000 meters will be conducted	Mar-19~ Jun-19 & Dec-19~ Jun-20
GD3	Conduct detailed Geotechnical Study by means of Cone Penetration Tests (CPT), performing all necessary tests including cohesion, angle of internal friction, pore water pressure, permeability test etc., collecting all necessary data and information and them in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 5,000 meters will be conducted)	Mar-19~ Jun-19 & Dec-19~ Jun-20
GD4	At the same bore hole location obtain shear wave velocity profile from the indirect tests such as MASW, SASW, seismic refraction, reflection etc. so that the test results from the direct and indirect geophysical tests can be compared at the selective grid points.	May-19~ Aug-19

2.4.3 D – Deliverables

Tasks	List of Reports/ Documents to be submitted or approved	Duration
D1	Interim Report including Records of Consultations	Jan-19~ Feb-19
D2	Final inception report on way forward and Project organization	Jan-19~ Mar-19
D3	Data Collection report on mapping systems in particular maps representing geologic hazards, climate and metrological hazards, soil and geotechnical, natural drainage, elevation, and other	Mar-19~ Jun-19
D4	Propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning.	May-20~ Oct-20
D5	Develop a plan for urban expansion and commensurate land servicing with adequate infrastructure;	May-20~ Oct-20
D6	Deploy the conditions for the provision of adequate, affordable housing as an alternative to integrated, locally managed urban development and housing programs with national support mechanisms.	May-20~ Oct-20
D7	Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the Draft Dhaka Regional and Urban Resilience Strategy.	May-20~ Oct-20
D8	Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans	Nov-20~ Dec-20
D9	Prepare Action-oriented guidelines and tools focusing on priority areas such as risk sensitive urban planning, design, infrastructure, housing, employment generation, governance and finance	Jan-21~ Feb-21
D10	Complete a RSLUP Guidebook as an update to the RSLUP Guidebook produced by Bangladesh Earthquake Urban Resilience Project	Mar-21~ May-21

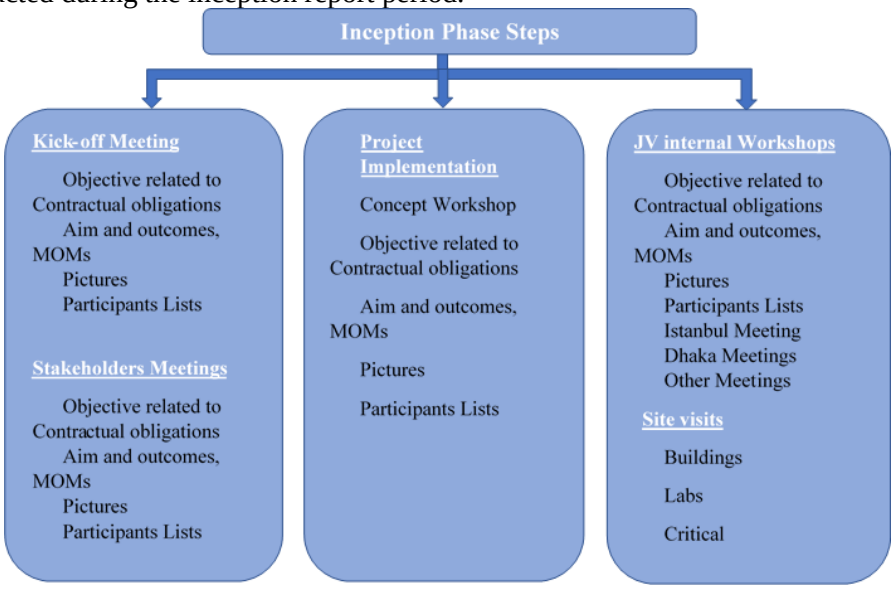
2.4.4 ID - Interim Deliverable

Tasks	List of Reports/ Documents to be submitted or approved	Duration
ID-1	Preparation of the ToRs and evaluation criteria regarding forming the POC.	Jan-19~ Mar-19
ID-2	Evaluation of the experts and result based matrix	Jan-19~ Mar-19
ID-3	Report on the outcomes of the kick off meeting	Jan-19~ Mar-19
ID-4	Report on past studies reflecting the documentation process and methods	Jan-19~ Apr-19
ID-5	Report identifying the potential gaps in data.	Jan-19~ Apr-19
ID-6	Report on demographic and socio-economic data characteristics and incorporate into the Planning Knowledge Base	Jan-19~ Apr-19
ID-7	Mapping the initiatives related to risk sensitive urban planning and governance sector;	Jan-19~ Apr-19
ID-8	Report on outcomes of the consultation and organograms related to key stakeholders to be engaged in the process.	Jan-19~ Apr-19
ID-9	Develop a report on the overall characteristics of the governance and policies including the influence on shortcomings	Jan-19~ Apr-19
ID-10	Document urban patterns of development, physical and environmental conditions, conflicts in land uses, zoning violations, and other relevant planning information	Jan-19~ Apr-19
ID-11	Conduct workshops and sharing knowledge activities with relevant stakeholders	Jan-19~ Apr-19
ID-12	Report for Proceedings and outcomes of the awareness campaigns and trainings	Nov-20~ Dec-20
ID-13	Develop a Guideline on Monitoring and Evaluation focusing on tool development	Nov-20~ Dec-20
ID-14	Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the RSLUP training.	Mar-21~ May-21

3. Inception Phase Activities

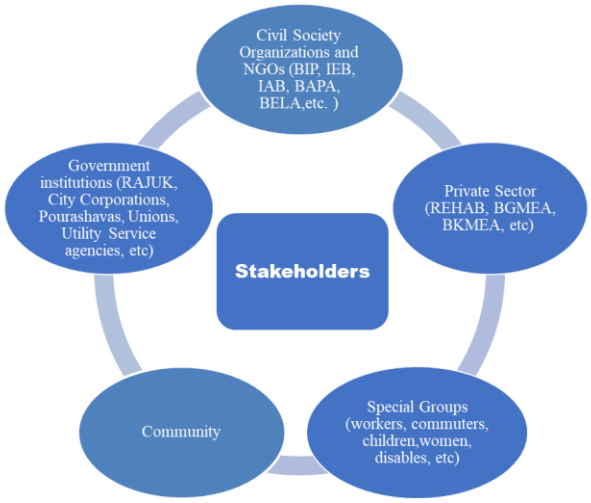
3.1. Introduction

By completion of the inception phase, the JV Consultants Team will have gained a clear and in-depth understanding of current conditions to support the situational and feasibility analysis. Following activities has been conducted during the inception report period.



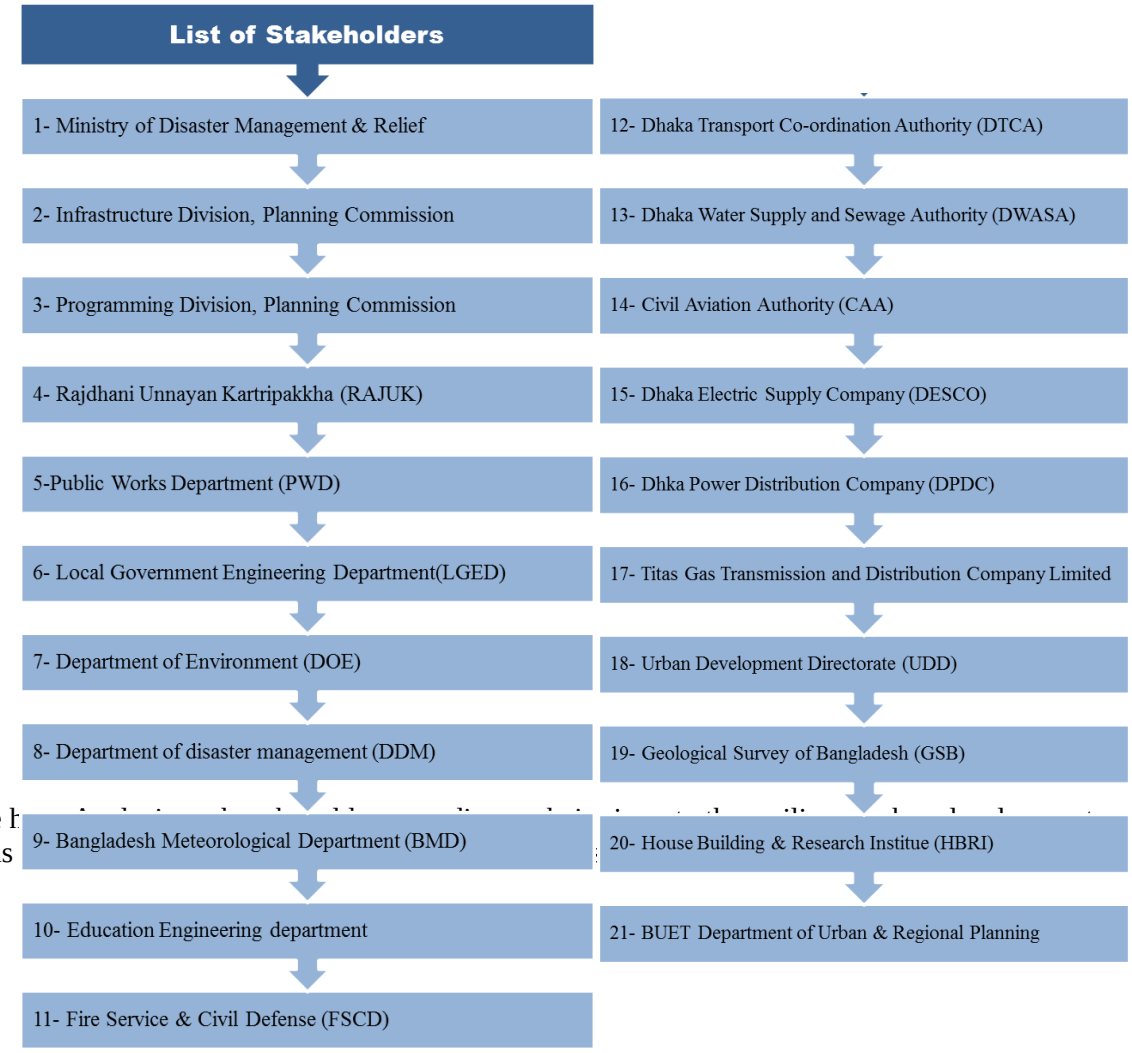
3.2. Stakeholder Analysis

Stakeholders are main actors and beneficiaries of the land use planning as well as environmental authorities in Dhaka. JV Identified the key public and private stakeholders analyzing their interests and incentives for urban development and planning. Based on these data a participatory plan of the stakeholders to the project could be captured.



3.2.1 List of Stakeholders

We have among many stakeholders identified following as the most relevant stakeholder.



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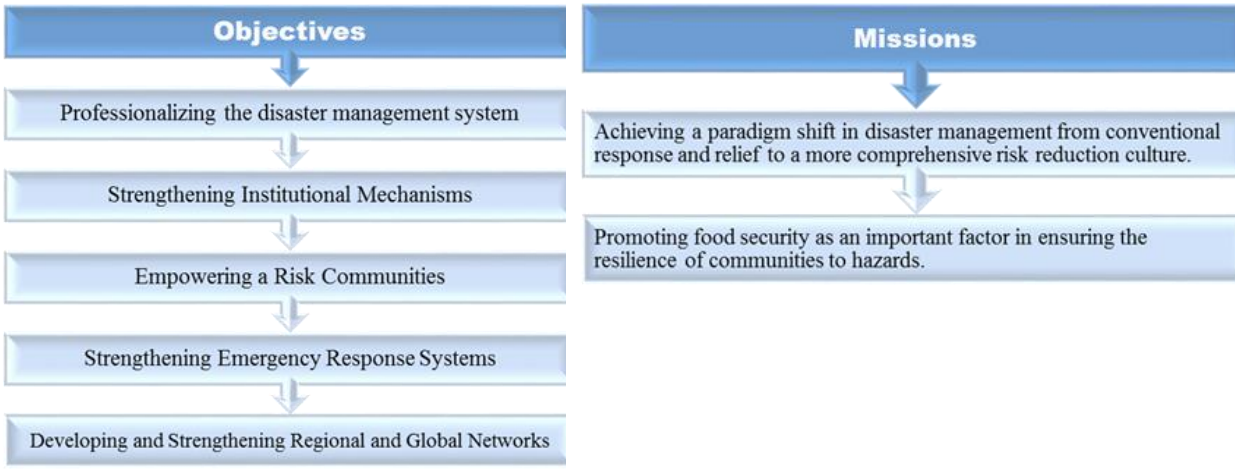
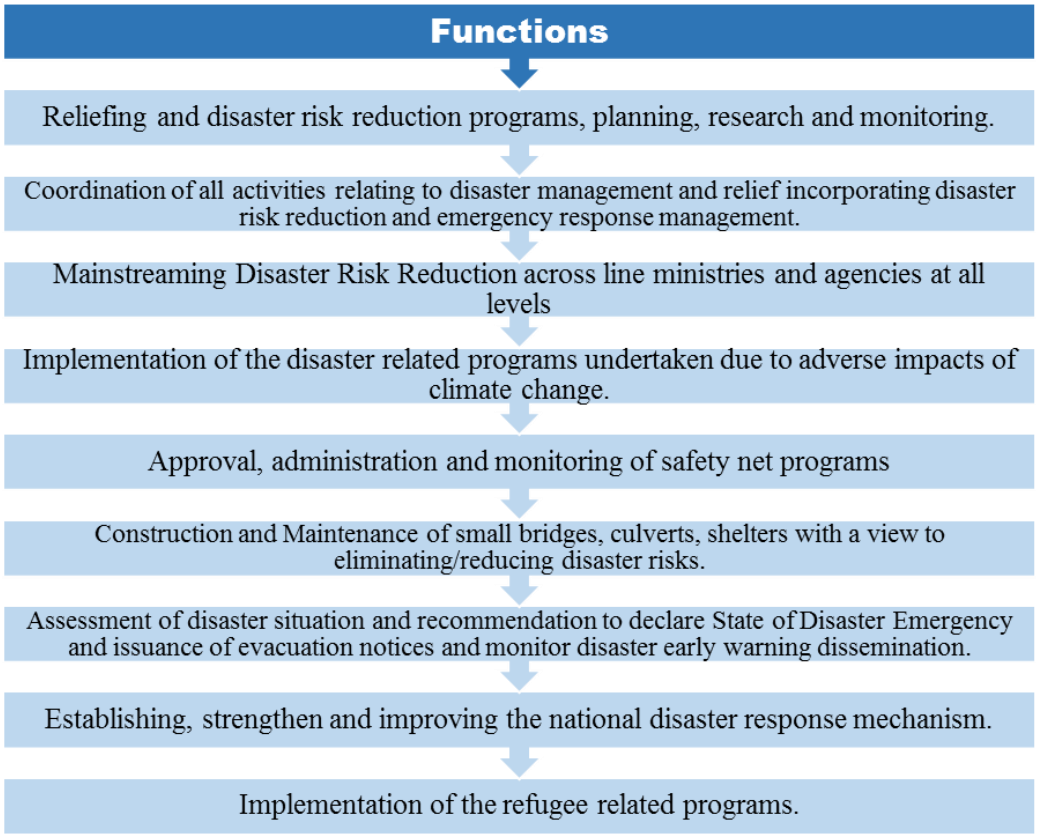
This

3.2.2 The Ministry of Disaster Management and Relief

Responsible for reducing the risks of vulnerable people from the effects of natural, environmental and human induced hazards.





3.2.3 Infrastructure Division & Programming Division Planning Commission

Objectives

- Improvement and maintenance of rural infrastructure
- Rural infrastructure development program will be taken up for development of growth centers, connecting roads, bridges and culverts
- Creating direct employment opportunity for the rural poor through improvement and maintenance rural infrastructure
- Creating indirect employment opportunity in road transport, trading and other sectors.
- Improving utilization of health and education services/facilities
- Contributing towards reduction at the local level
- Improvement in the quality of life of the rural population through mobilisation of the rural masses and resources
- Attainment of food production beyond the self-sufficiency level in the shortest possible time
- Development of necessary infrastructure, utilities and other services needed to promote growth
- Development of industries essentially based on comparative advantage of the country
- Achievement of a lower population growth
- Strengthening of the country's scientific and technological
- Protection and preservation of environment by putting in place adequate regulatory regimes and effective institutions

Functions

- **Policy Planning**
  Determination of objectives, priorities, strategies and policy measures for development plans
- **Sectoral Planning**
  Identificting role of the various economy sectors required to reach Plan objectives and goals
- **Programme Planning**
  Dormulation of detailed resource allocation to realize the Plan objectives
- **Project Planning**
  Appraisal of projects embodying investment decisions for implementation of the sectoral plans
- Evaluationing the impacts of projects on the people's living standard.
- Formulation of Reduction Strategy Paper (PRSP)
- Evaluation of Plans and their impact on the economic development

Visions

- Developing, maintaining and managing transport, trading infrastructure
- Taking care of environmental and social issues.

3.2.4 Rajdhani Unnayan Kartripakkha (AJUK)

Responsible for making Dhaka a livable, functional & resilient metropolis respecting local socio-cultural fabric & environmental sustainability

Missions

- Planning authority to build a healthy and livable capital city
- Effective land use management for livable city
- Transport for efficient connectivity
- Affordable housing for all
- Enhancing Dhaka's employment and productivity
- Public facilities for better living
- Protecting natural and healthy environment
- Preserving open space for recreation and aesthetics
- Resilience through disaster prevention and mitigation
- Enhancing the cityscape with urban design and landscape

Functions

- Township Development/Housing Estate/Site & Services
- Road & Bridge Construction
- New Township/ Housing

3.2.5 Public Workers Department (PWD)

Responsible for providing housing facilities for standard living of the people in urban areas and better working environment for public offices through planning, research and proper use of land.

Objectives

- Providing official and residential accommodation
- Promotion of Affordable Housing.
- Planning Urbanization.
- Management of Government Owned Property.
- Management of Public Buildings and Other Infrastructur

Visions

- Safe, affordable, habitable housing and facilitative working environment

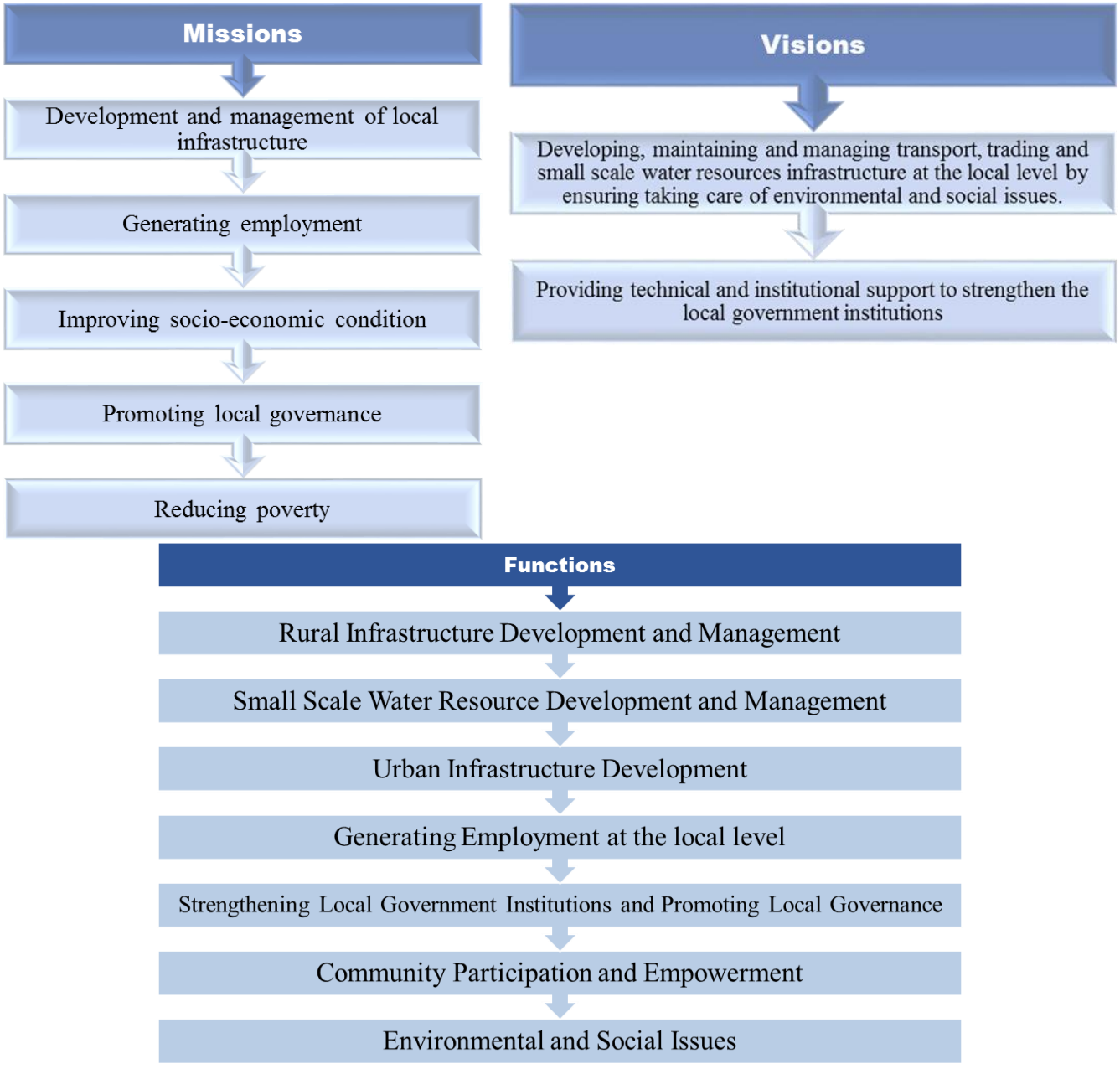
Missions

- Constructing durable, safe, low cost houses for low and middle income people
- Planning urbanization
- Constructing infrastructure with modern amenities for all ministries through proper planning
- Construction of Buildings for Other Agencies
- Maintenance of Public Parks
- Designing and Construction of Public Buildings
- Construction of National Monuments
- Repairing and Maintenance of Public Buildings

Functions

- Formulation and amendment of housing policies, Laws, codes and rules
- Planning and undertaking of activities to solve housing problem of the country
- Preparation of laws and policies to promote housing sector
- Research and technological innovation on housing, building construction, urban development.
- Preparation of architectural and structural design of publ buildings and other infrastructure.
- Planned urbanization, proper use of land and developmer
- Conducting research and innovate technology on urbanization, housing, construction of buildings
- Creation of opportunities for involvement of the private sector in solving urbanization and housing Problems

3.2.6 Local Government Engineering department (LGED)



3.2.7 Department of Environment (DOE)

Responsible for ensuring a clean, healthy, beautiful and safe environment for the present and future generations.

Responsible for ensuring sustainable environmental governance for achieving high quality of life for the benefit of present and future generations.

Objectives

- Sustainable environment and forest through conservation of ecosystem and biodiversity
- Controlling environmental pollution; addressing climate change
- Research, floristic survey
- Development of forest resources

Functions

- Climate Resilient Participatory Afforestation and Reforestation
- Adaptation to Climate Change and Rehabilitation of Livelihood

Missions

- Creating a safe environment for current and future generations.
- Proper application of environmental laws and regulations.
- Increasing public awareness on the environment.
- Ensure sustainable development and environment good governance.
- Ensuring economic development and environmental management in the development plan.
- Encouraging "Green Growth"
- Sustainable actions on critical environmental problems

Visions

- Clean Air & Sustainable Environment
- Ecosystem based development, management and conservation
- Strengthening Institutional Capacity to Reduce Short-Lived Climate Pollutants
- Climate Resilient Ecosystems and Livelihood
- National Capacity Development
- Water & Environmental Pollution Control
- Management of Water Quality
- Management of Capture Fisheries
- Sustaining Soil Quality
- Air Quality Management

3.2.8 Department of disaster management (DDM)

Responsible for reducing the risk of people from the effects of hazards

Responsible for having an efficient emergency response system capable of handling large scale disasters

Missions

- Enhancing disaster preparedness for effective response
- Investments for building resilience against chronic disasters
- Disaster preparedness efforts and progress

Vissions

- Protecting Bangladesh from the adverse effects of climate change and global warming
- Protecting vulnerable people from natural calamities
- Taking actions for the prevention of industry and transport related air pollution
- Ensuring disposal of waste in a scientific manner
- Making Bangladesh an ecologically attractive place and to promote tourism
- Eradicating poverty and achieve economic and social wellbeing for all the people

3.2.9 Bangladesh Meteorological Department (BMD)

Responsible for minimizing the loss of lives by correct weather forecasting.

Missions

- Correct and timely weather forecast
  - It is observed that the loss of lives and properties has been minimized, because of correct and timely Cyclone forecast and Disaster management
- Correct flood forecast
  - The losses has been reduced to a minimum due to correct flood forecast well in time and proper management
- Issuing warning with sufficient lead time.
  - Death tolls also decrease for issuing warning with sufficient lead time under Squall/Tornado
- Heavy rainfall warning
  - Losses and damages also reduced mainly
- Warning of Heat and Cold Wave
  - Lives are saved also from unpleasant heat and cold wave because of better warning
- Agricultural forecast
  - It helps for better planning, seedling, pesticides, harvesting
- Drought warning helps for decision of arranging of irrigation for better yield

3.2.10 Education Engineering Department

Responsible for increasing well educated, efficient and moral human resources

Objectives

- Improving access to quality secondary education.
- Ensuring equity and equality at all levels of education
- Generatving skilled human resources for domestic and international labor market
- Improvving the overall quality and expansion of tertiary education
- Strengthen governance in education management

Missions

- Increasing well educated
- Increasing efficient and moral human resources
- Quality education for all

Functions

- Focus on improving the quality of higher education
- Conducting research and training
- Establishing specialized universities
- Providing open educational resources

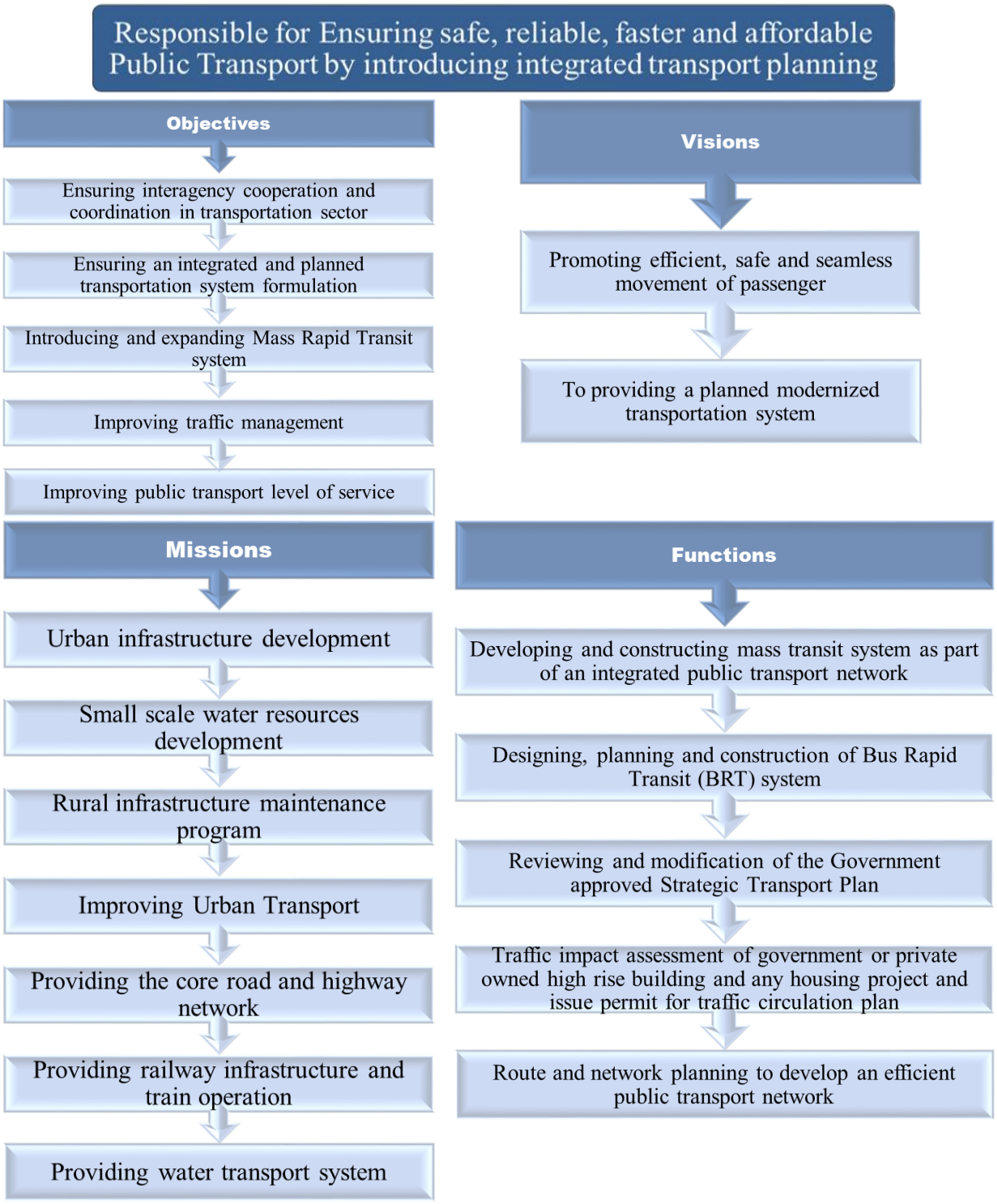
3.2.11 Fire Service & Civil Defense (FSCD)

Responsible for acquiring competency as one of the leading fire fighting and disaster management organization in Asia.

Missions

- Protectving and savving lives and property for a safe and secured Bangladesh
- Improving Fire and General Building Safety in Bangladesh
- Improving Labor inspection procedures and tools for factory inspection
- Improving Capacities of inspectors from the Ministry of Labor and Employment to conduct building and fire safety inspections
- Efficient and timely inspections are carried out by relevant Bangladeshi authorities
- Making a building and Fire Safety data tracking system
- Harmonized standards and procedures upon which the future of Bangladesh building and fire safety will be based

3.2.12 Dhaka Transport Co-ordination Authority (DTCA)



3.2.13 Dhaka Water Supply and Sewage Authority (DWASA)

Responsible for the best water utility in the public sector of Asia-Environment friendly, Sustainable and Pro people Water Management System

Missions

- Providing safe and sufficient water for drinking
- Ensuring sanitation and good hygienic condition through proper disposal of domestic and other sewerage
- Ensuring efficient storm-water drainage system in Dhaka city
- Construction, operation, development and maintenance of necessary infrastructure (deep tube well, water treatment plant)
- Supplying safe water to residential, industrial and commercial customers.
- Construction, development and maintenance of sewage treatment and sewerage system
- Construction, development and maintenance of storm sewer lines to remove water congestion in the city

Visions

- Sustained economic growth and public health improvement in urban centers in Bangladesh
- Promoting good water resource management and water conservation
- Demand control and public awareness

3.2.14 Civil Aviation Authority (CAA)

Responsible for completing the transition to performance-based safety regulation and taking significant steps towards refining the way we regulate security

Functions

- Controling and regulation of air transport services
- Controling and development of aerodromes in the country
- Making better provisions for the control of manufacture, possessions, use, operation of aircrafts

3.2.15 Geological Survey of Bangladesh (GSB)

Functions

- Geological mapping of the country.
- Exploration of mineral resources.
- Geophysical investigation.
- Engineering, Urban, and geotechnical surveys.
- Study on geo-hazards.

3.2.16 Dhaka Electric Supply Company (DESCO)

Responsible for supporting economic development and social progress by providing safe, reliable and sustainable electricity.

Objectives

- Safety
- Customer Focus
- Community Focus
- Operational Excellence
- Performance Driven Culture

Missions

- Achieving maximum power to the customers
- Achieving and maintaining the highest degree of efficiency, reliability and responsiveness

Visions

- Cooperate with customers for providing quality power and electricity.
- Making sure to provide better services to the customers
- Ensuring maximum security for the customers
- Continuous development with power distribution, safe, reliable and affordable

3.2.17 Dhaka Power Distribution Company (DPDC)

Responsible for providing quality and reliable electricity to the people of Dhaka city for desired economic, social and human development of the country.

Objectives

- Improving power generation, transmission and distribution system.
- Increasing access to electricity.
- Ensuring capacity development.
- Harnessing power through regional cooperation

Missions

- Ensuring reliable electricity for all
- Integrated development of power generation, transmission and distribution system

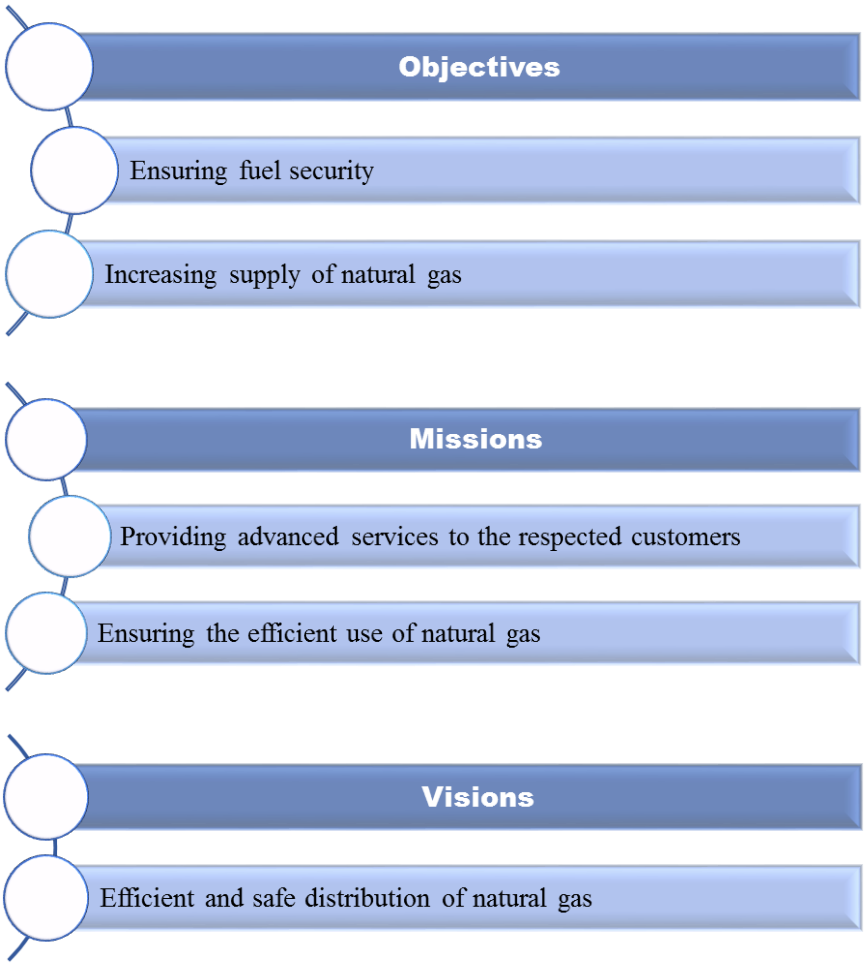
Visions

- Delivering quality electricity with service excellence.
- Making electricity available on demand
- Ensuring customers' satisfaction.
- Reaching self-sufficiency and profitability by increasing income and reducing expenditure
- Access to quality electricity in a cost-effective and affordable manner

Functions

- Managing activities relating to power generation, transmission and distribution.
- Formulating plans consistent with the increasing demand for electricity in the country
- Improving the standard of living of rural people through rural electrification.
- Developing renewable energy, ensure energy efficiency and energy saving activities.

3.2.18 Titas Gas Transmission and Distribution Company Limited



3.2.19 Urban Development Directorate (UDD)

Responsible for developing the city with improved connectivity, better health and education facilities, modern agriculture and protection from natural disaster

Objectives

- Preparing comprehensive development plan for the entire upazila including, services, land use and agriculture under Structure Plan, Urban Area Plan, Rural Area Plan
- Assessing earthquake hazard, vulnerability and risk and make recommendations for mitigation measures
- Optimizing resources and activities for sustenance of marginal people
- Integrating ecology, economy and social resources with the mainstream of development process of the country
- Framing policies for the best use of land and its control
- Formulation of Policies and plans for mitigation of different types of hazards, minimizing the adverse impacts of climate change and recommend possible adaptation strategies for the region.
- Formulation of Policies and plans for gradual nucleation of settlements with policies and plans for development of growth centers of the area.

Visions

- Augmenting the quality of life of the people
- Improving the environment
- Planned development activities for adequate infrastructure
- Services and utility provision, to make optimum utilization of resources especially land
- Ensuring a geographically balanced urbanization
- Reducing local and regional disparity by alleviating poverty

Functions

- Advising the Government on matters of policy relating to urbanization, land use and land development
- Undertaking socio-economic research and collection of data for determination of the location and pattern of future urban development
- Preparing programmes for urban development

3.2.20 House Building & Research Institute (HBRI)

Responsible for resolving the housing crisis due to the maximum use of country's construction materials and limited resources

Objectives

- Improving the rural housing of Bangladesh pre and post disaster
- To substantially improving the living conditions of the rural population
- Increasing resilience to future disasters
- Introducing environmentally sustainable model of rural house building.
- Acquiring a better understanding of and raise awareness on what adequate and more resilient rural housing is for Bangladesh
- Promoting and facilitate optimal use of the resources available for rural housing
- Guiding post disaster sheltering interventions, towards greater resilience of rural housing
- Promoting innovative building material and construction technologies that can help achieve social and environmental sustainability

Missions

- Resolving the housing crisis
- Making safe and sustainable housing available for the limited income population
- Increasing and ordering the quality standards of the country's construction industry

3.2.21 BUET Department of Urban & Regional Planning

Responsible for building an urban with the purpose of ensuring basic services for all urban citizens by reducing spatial and social imbalance and inequality through focusing on disadvantaged groups

Objectives

- Promoting knowledge and experience-sharing among urban sector stakeholders
- Contributing the formulation and implementation of policies improving practice in urban sector management, primarily to reduce urban poverty.
- Raising public awareness about the growing importance of the urban sector and urbanization in Bangladesh

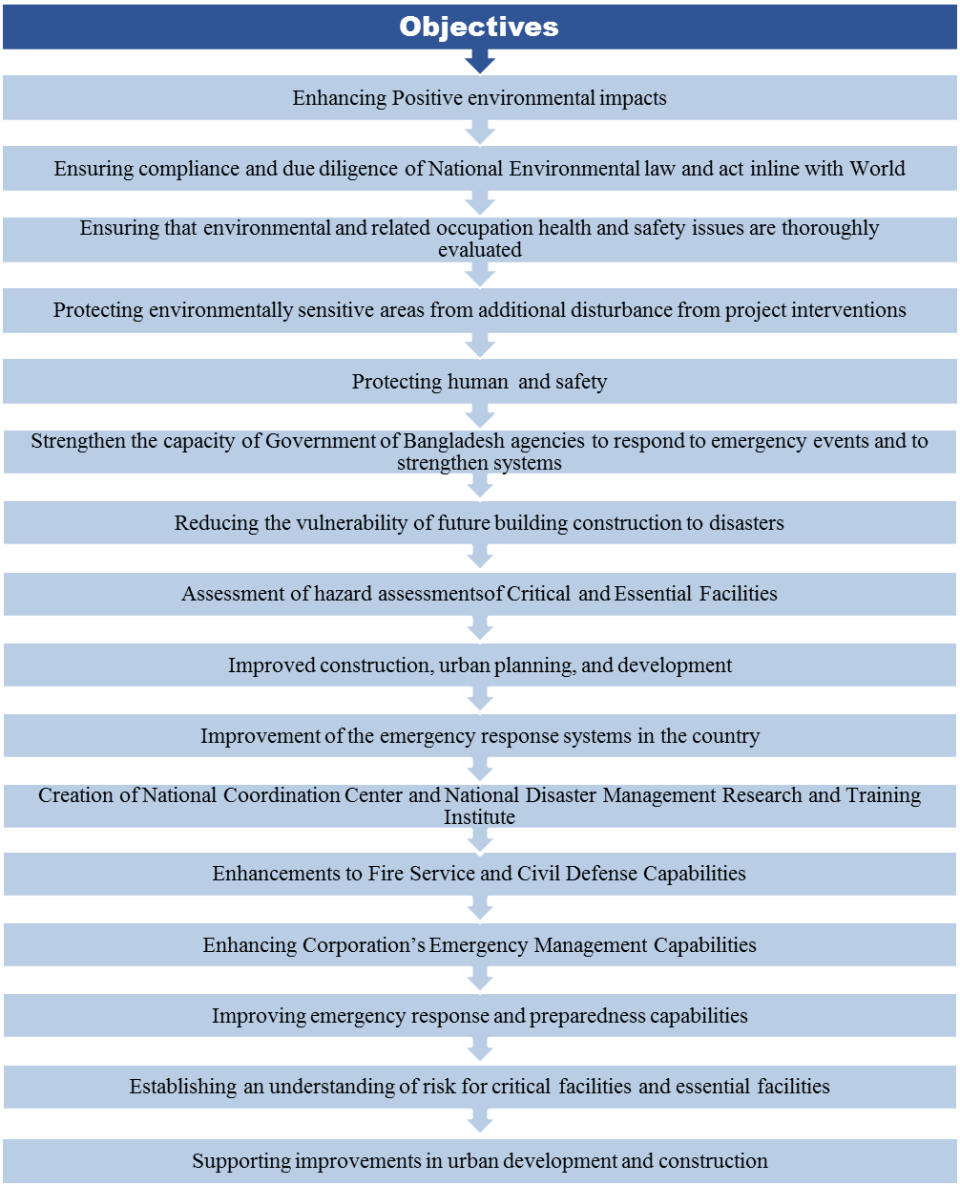
3.2.22 Department of Health

Responsible for supporting creation of an enabling environment whereby the people of Bangladesh have the opportunity to reach and maintain the highest attainable level of health.

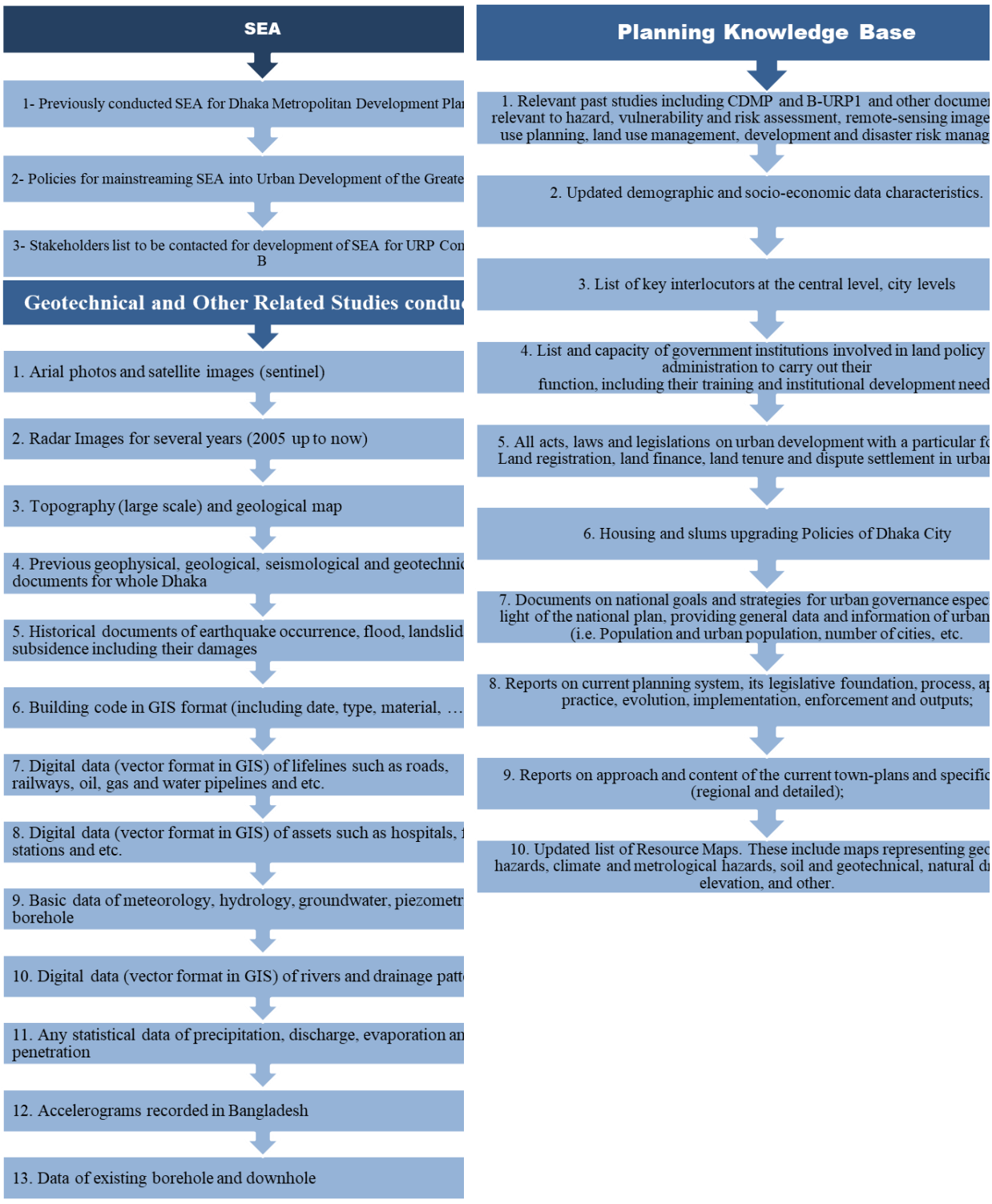
Objectives

- Sustainable improvement in health, nutrition and family welfare status of the people, particularly of the vulnerable groups
- Making health service equitably affordable and accessible to all and ensuring an efficient and effective quality health service.
- Innovations in health care, e.g., geographical targeting to benefit high areas
- Creating health related safety net to ensure supply of service, medicine, equipment, etc., for emergency relief to the disaster affected people.
- Expanding the scope of health service provision to include proven alternative health care system
- Establishing an effective linkage with global and regional information network for strengthening health sector's research and systems development.

3.2.23 Urban Resilience Project



3.3. Needs Assessment and Data Require for S-05



3.4. Meetings

3.4.1 Kick off Meeting

- **Aim and Outcomes, MOMs**

MINUTES OF KICK OFF MEETING					
Project Name	Risk Sensitive Land Use Planning Practice for Urban Resilience Unit – S-05 - DHAKA				
Related Department	**RAJUK**				
Meeting Subject &Number	**Kick Off Meeting**				
Location	**RAJUK PIU Head Office**	Date	10.12.2018	Time	**17:45 – 19:30**
Chairperson / Moderator	Mr. Abdul Latif Helaly				

ATTENDEES			
Sr.	Name	Organization	Role / Affiliation
1	Abdul Latif Helaly	RAJUK – Project Implementation Unit (PIU)	Project Director
2	Md. Aminur Rahman (Sumon)	RAJUK – Project Implementation Unit (PIU)	Deputy Project Director
3	Md. Taimur Tanvir	RAJUK – Project Implementation Unit (PIU)	Asst. Engineer (Geotechnical)
4	BM Nurul Absar	RAJUK – Project Implementation Unit (PIU)	Asst. Engineer (Geotechnical) Focal Point S-05
5	Saleh Ahmed Helaly	RAJUK – Project Implementation Unit (PIU)	Technical Officer, S-04
6	Omer Unlu	NKY	General Coordinator
7	Tolga Sahin	NKY	Overseas Director
8	Ahmadul Hasan	SDE	Executive Director
9	Ugurhan Akyuz	NKY-PROTEK-SHELTECH-SDE	Team Leader S-05
10	Ahmet Yakut	NKY-PROTEK-SHELTECH-SDE	Deputy Team Leader S-04
11	Sadettin Sezer	NKY-PROTEK-SHELTECH-SDE	Deputy Team leader S-05
12	Sara Khoshnevis	PROTEK	CEO
13	Abu Saleh Md. Shahidullah	NKY-PROTEK-SHELTECH-SDE	Urban Planner, S5
14	Mehmet Yildiz	NKY-PROTEK-SHELTECH-SDE	Logistics & Admin
15	Rafael Alaluf	NKY-PROTEK-SHELTECH-SDE	Vulnerability and Risk Assessment Expert
16	Syed Ahsanul Haq	NKY-PROTEK-SHELTECH-SDE	S-4, Civil Engineer

17	Md. Anisur Rahman	Sheltech	Deputy General Manager

ATTACHED DOCUMENTS	
1	Photos
2	Attendance sheet

AGENDA

	Subjects	Presenter	Duration (mins)
1	Introduction of the Joint Venture and Experts	Omer Unlu	10
2	Briefing the attendance about the Stakeholder Workshop	Ahmed Yakut	20
3	Subjects related with starting works		60

No.	Discussion
1	PIU Director requested the JV to submit Inception Reports on 20 December 2018. It will be submitted to the World bank.
2	PIU Director said the test results of the SPT and CPT tests done previously should not be used. Only the reports of the new tests should be used.
3	PIU Director said there is no truck mounted CPT equipment available in Bangladesh. He further advised that a truck mounted CPT equipment should be provided. NKY General Coordinator said that, the JV is looking for a locally available CPT equipment.
4	PIU Director advised that the offices of S-04 and S-05 should be different. The staff should not use the same office.
5	PIU Director criticized the NKY General Coordinator that presentations of S-04 and S-05 projects should be done separately on 10 December 2018.
6	PIU Director said that Sheltek has the Revised Detailed Area Plan (Revised DAP) and the JV can use it.
7	PIU Director instructed the JV to submit the CVs of the key experts.
8	The status of the already submitted Advance Payment Bond discussed.

Prepared By:	Approved By:
Abu Saleh Md. Shahidullah Urban Planner	

- **Pictures**

Kick-off: The kick-off meeting with URP team members was held in the URP Project Director's office on 30 October 2018.

- **Participants Lists**

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Project Implementation Unit (PIU)
Urban Resilience Project: RAJUK Part
RAJUK Commercial Complex Cum Car Parking Building (8th & 9th Floor),
Gulshan,- 1, Dhaka-1212

Rajdhani Unnayan Kartripakkha (RAJUK)

Meeting with Consultants

Package No. : URP/RAJUK/ S-4&5

Date: 10-12-2018

Time: 5:45 pm

Venue: Office of the Project Implementation Unit at 9th Floor of RAJUK Commercial Complex cum Car Parking Building, Gulshan-1, Dhaka-1212

Sl. No.	Name, Designation & Organization	Phone No. & Email Address	Signature
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Urban Resilience Project: RAJUK Part
RAJUK Commercial Complex Cum Car Parking Building (8th & 9th Floor),
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Rajdhani Unnayan Kartripakkha (RAJUK)

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12	G. M. NURAL ABSAR (Focal of S-05) URP: RAJUK { Assistant Engineer (Civil & Geotechnical)	01675720021 showrovrajuk@gmail.com	
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14	Syed Ahsanul Haq S-4 (N) Civil Engr	01715 9748	
15	D. Ahmedul Hasan SDE	01713034019	
16			
17			
18			
19			

3.4.2 Stakeholders Meetings

- **Objective related to Contractual Obligations**

  Main Objective: To assess the vulnerability & risk of Dhaka's critical facilities and develop a prioritized investment plan through an analytical approach

  Major Outputs: Long-Term Vulnerability Reduction Investment Plan, Dhaka Urban Resilience Strategy

- **Aim and Outcomes, MOMs**

Inception Workshop on S-4 and S-5 component
Urban Resilience Project: RAJUK Part
Agenda: Stake holders meeting

Meeting Attendees					
	Name	Institution	Position	Telephone no	E-mail
1.	Engr. Md. Kamruzzaman Khan	Titash Gas T&D Company Ltd.	Director (Operation)	+8801939921002	kamruzzamanjg64@gmail.com
2.	Saddettin Sezer	NKY	Managing Director	+9054221711516	sadettin.sezer@nky.com.tr
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- **Discussions on S-5**

Comment/Question from Prof. Dr Kamrul :

Dhaka city has a variety of soil type including low lying lands filled with sand. Uniformly distributed grid system for subsoil investigation may not work. Different location may require different techniques for sub soil investigation and there is not enough data to identify the heterogeneity of the soil underneath existing structures. How the problem is dealt with? How to incorporate the existing buildings to the land use planning?

Answer from NKY:

- ✓ Groups of geotechnical expert from both local and overseas are working on problems like this
- ✓ Data from 2014 World Bank UNDP project will work as an input here
- ✓ Two individual grid system has been considered for sub soil investigation depending on homogeneity and heterogeneity of soil type according to available data.

Comment/Question from UDD (Mr. Shaheen) :

Is there any risk assessment scope for this project? Is there any measure for earthquake protection? Is there any contingency planning?

Answer from NKY:

- ✓ Risk assessment is included in S-4.

Comment from Dr Sarwar:

Contingency planning is very difficult for Dhaka city as most of it had an unplanned growth. Most of the buildings have been constructed without following BNBC. Then again Dhaka is very densely populated and it's very difficult to evacuate such a large amount of people. Traffic is one of the major concerns in Dhaka city.

Comment from Mr. Ashraf (DDM):

Contingency plan and evacuation route has been prepared as part of CDMP 1 &2 for Uttara and Rayerbajar. Evacuation routes will have earthquake resilient buildings. Some of the disaster management will be incorporated in land use planning. CDMP was a technical assistant project .There is a huge amount of unused data from ECRRP project for multi hazard risk for vulnerability assessment which can be used. Huge action plan after 2004 flood in Dhaka. Contingency plan would not work without humanitarian aspect.

Comment from GSB:

GSB has prepared a map for structure suitability for the land under the authorization of RAJUK.

MINUTES OF STAKEHOLDERS MEETING					
Project Name	**Risk Sensitive Land Use Planning Practice for Urban Resilience Unit – S-05 - DHAKA**				
Related Department	RAJUK				
Meeting Subject &Number	Inception Workshop				
Location	Multi-purpose Hall JIDPUS-BUET, Dhaka	**Date**	10.12.2018	**Time**	9:30 – 11:30
Chairperson / Moderator	Mr. Omer Unlu				

ATTENDANCES			
Sr	**Name**	**Organization**	**Role / Affiliation**
1.	Engr. Md. Kamruzzaman Khan	Titash Gas T&D Company Ltd.	Director (Operation)
2.	Sadettin Sezer	NKY	Deputy Team leader S-05
3.	Saiful Alam	IWM	Sr. WRP
4.	Dr. Ahmadul Hasan	SDE	
5.	Tolga Sahin	NKY	Overseas Director
6.	Ugurhan Akyuz	NKY	Team Leader S-05
7.	Syed Ahsanul Haque	SDE	Coordinator
8.	Fathiya Zaman	SDE	
9.	Mehmet Yildiz	NKY	Logistics & Admin
10.	Sarwar Jahan	SDE	Project Manager
11.	Shaheen Ahmed	Urban Development Directorate	Senior Planner
12.	Ahmet Yakut	NKY	Deputy Team Leader S-04
13.	Md. Nuruddin Sarker	GSB (Geological Survey of Bangladesh)	Director
14.	Engr. Shahnamul Quader	EED	XEN (Design)
15.	Md. Atikur Rahman	Sheltech	Junior Urban Planner
16.	Zinan A. Urmi	SDE	Geotechnical Engineer
17.	Raquib Ahsan	BUET JIDPUS	Director
18.	Dr. M Hossain	SDE	P. Manager
19.	Rafael Alaluf	EQRM/Protek	

Sr	Name	Organization	Role / Affiliation
20.	Md. Shajal Khan	SDE	Civil Engineer
21.	Iffat Haque	SDE	Consultant
22.	Prof. Dr. M. Qumrul Hassan	Geology, DU	Professor
23.	Md. Samsur Rahman	BUET JIDPUS	Admin
24.	MusferaJahan	Sheltech	Urban Planner
25.	Abu Musa Md Abdullah	Detailed Area Plan (2016-2035)	Urban Planner
26.	Uttama Barua	Dept. of URP, BUET	Lecturer
27.	Helaluddin Haque	DTCA	APSL
28.	Prof. AbulKalam	BIP	Professor
29.	Md. Nazrul- Islam	DSCC	City Planner
30.	Tanjiba Rahman	SDE	Urban Planner
31.	K. Habibur Rahman	SDE	Admin
32.	Ishrat Islam	Dept. of URP	Professor
33.	Ugurhan Akyuz	NKY	Team leader S-05
34.	Towhidul Islam	Sheltech	Urban Planner
35.	Abu Saleh Md. Shahidullah	Sheltech	Urban Planner

ATTACHED DOCUMENTS

1	Agenda
2	List of Data required
3	List of Stakeholders
4	Questionnaire for Implementation
5	Presentation slides

AGENDA

Sr.	Subjects	Presenter	Duration (mins)
1	Welcome speech and Project overview	Arch. Omer Unlu	15
2	Introduction of Consultants, Team Composition, Overall Objectives, Methodology and Work Plan	Prof. Uğurhan Akyuz	25
3	Questions and answers from the participants		90
4	Group Panel Discussion		
5	Concluding Remarks	Arch. Omer Unlu	10

No.	Discussion
1	Presentation for S-05 project done.
2	**Saiful Alam, Senior Water Resource Consultants, Institute of Water Modeling (IWM)** said, • Is plan density of data collection uniformly distributed or just follow any rules because land types of Dhaka vary? There are low lying land and land filling going over the city 4-5 meter and city will be grown. • Ground water table depletion are another big problem of Dhaka city. • Low laying land is quite vulnerable for the infrastructure development and it will be nice this types of risk in the vulnerability mapping. • Micro zonation mapping should be in ward level at least.  Replied by **NKY**, ✓ Groups of geotechnical expert from both local and overseas are working on problems like this ✓ Data from 2014 World Bank UNDP project will work as an input here. ✓ Two individual grid system has been considered for sub soil investigation depending on homogeneity and heterogeneity of soil type according to available data. 
3	**Shaheen Ahmed, Senior Planner, Urban Development Directorate (UDD)** said, • There are 75k vulnerable structure in Dhaka city. Will there be any investigation about them? • Will you prepare contingency plan for Dhaka city like if massive earthquake happened than what we do. As we know many people are in the secretariat and Dhaka medical college if massive earthquake happened than what we will do. • DDM has a project national resilience program with some data helpful for this project.  Replied by **NKY**, Risk assessment is included in another project S-4 which will be presented next.

No.	Discussion
	Mr. Dr. Sarwar Jahan discussed about contingency planning • Contingency planning is very difficult for Dhaka city as most of it had an unplanned growth. • Most of the buildings have been constructed without following BNBC. • Then again Dhaka is very densely populated and it is very difficult to evacuate such a large amount of people. • Traffic is one of the major concerns in Dhaka city. 
4	**Abu Musa Md. Abdullah, Urban Planner, Sheltech (Urban Planner, DAP)** said, • Under CDMP-2 they prepared contingency plan worldwide. • Contingency plan already added in the Dhaka Detailed Area Plan (DAP). 3 contingency plan are done in DAP in Uttara, Rayerbazar and Gendariya. In these plan evacuation route are shown part of contingency plan and along this route guideline provided that all of the structure should be designed strictly according to the (Bangladesh National Building Code) BNBC.  • Disaster risk issue are added land use plan of DAP like fire hazard, earthquake. Their fault fine also mentioned. • Geological Survey of Bangladesh (GSB) already prepare Infrastructure Suitability Map for the entire DAP area. In their map there are more or less 500 boreholes studied. They prepared land use map like land suitable for high-rise, for moderate and for land vulnerable for different hazard. They also provide guideline.
5	**Prof. Dr. Muhammad Qumrul Hassan, Department of Geology, University of Dhaka** said,

No.	Discussion
	• Bangladesh is standing on sediment basin that different from other. • Dhaka city called mega city but it is for the population not by the development. • Hydro stereographic map should be prepared for the water level for sampling need to go in the earth some place 80 meter some places 40 meter. • Dhaka city are encircled by a series of fault because there have madhupur trend and modhupur trend is up rising from himaloy.  • Good geological map are essential for this project than think about the sampling position. • For the sampling there are two conditions. 1st is geological sub-surface conditions and 2nd is distribution of the habitant their structure, road etc. • A group is still working on a geological sub-surface mapping in three dimensional under the Dhaka University geological department.
6	**Sayed Ashraf, CMS, Department of Disaster Management** said, • ECRRP project funded by World Bank for risk and vulnerability assessment for whole country so to data collection is a good source for this project ECRRP. • Some of the disaster management will be incorporated in land use planning. CDMP was a technical assistant project. There is a huge amount of unused data from ECRRP project for multi hazard risk for vulnerability assessment which can be used. • Urban Flooding Action Plan, 2004 is useful for urban flooding plan.  • A project for the hospital critical assets USAID, funded by ADPC which is hospital emergency preparedness, will be the helpful for this project. This project is going on. • Contingency plan would not work without humanitarian aspect.
7	**Comment from GSB:**

No.	Discussion
	GSB has prepared a map for structure suitability for the land under the authorization of RAJUK.
8	Conclude the meeting of S-5

Prepared By	Approved By
Planner Towhidul Islam Sheltech (Pvt.) Ltd.	

Meeting Attendees					
Sr.	**Name**	**Institution**	**Position**	**Telephone no**	**E-mail**
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	Yakut		Leader S-04		
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18.	Dr. M Hossain	SDE	P. Manager	+8801714087795	drmonjur@yahoo.com
19.	Rafael Alaluf	EQRM/Protek		+905323558001	
20.	Md. Shajal Khan	SDE	Civil Engineer	+8801516757999	info.sdelbd@gmail.com
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MINUTES OF STAKEHOLDERS MEETING					
Project Name	Development of Risk sensitive Land Use Planning Practice S-05				
Related Department	**RAJUK**				
Meeting Subject &Number	**Inception Workshop**				
Location	**Multi-purpose Hall JIDPUS-BUET, Dhaka**	Date	10.12.2018	Time	11:30 14:45
Chairperson / Moderator	Mr. Omer Unlu				

ATTENDANCES			
Sr.	**Name**	**Organization**	**Role / Affiliation**
1.	Engr. Md. Kamruzzaman Khan	Titash Gas T&D Company Ltd.	Director (Operation)
2.	Sadettin Sezer	NKY	Deputy Team leader S-05
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5.	Tolga Sahin	NKY	Overseas Director
6.	Ugurhan Akyuz	NKY	Team Leader S-05
7.	Syed Ahsanul Haque	SDE	Coordinator
8.	Fathiya Zaman	SDE	
9.	Mehmet Yildiz	NKY	Logistics & Admin
10.	Sarwar Jahan	SDE	Project Manager
11.	Shaheen Ahmed	Urban Development Directorate	Senior Planner
12.	Ahmet Yakut	NKY	Deputy Team Leader S-04
13.	Md. Nuruddin Sarker	GSB (Geological Survey of Bangladesh)	Director
14.	Engr. Shahnamul Quader	EED	XEN (Design)
15.	Md. Atikur Rahman	Sheltech	Junior Urban Planner
16.	Zinan A. Urmi	SDE	Geotechnical Engineer
17.	Raquib Ahsan	BUET JIDPUS	Director
18.	Dr. M Hossain	SDE	P. Manager
19.	Rafael Alaluf	EQRM/Protek	

Sr.	Name	Organization	Role / Affiliation
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21.	Iffat Haque	SDE	Consultant
22.	Prof. Dr. M. Qumrul Hassan	Geology, DU	Professor
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24.	MusferaJahan	Sheltech	Urban Planner
25.	Abu Musa Md Abdullah	Detailed Area Plan (2016-2035)	Urban Planner
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35.	Abu Saleh Md. Shahidullah	Shetech	Urban Planner

ATTACHED DOCUMENTS	
1	Agenda
2	List of Data required
3	List of Stakeholders
4	Questionnaire for Implementation
5	Presentation slides

AGENDA

Sr.	Subjects	Presenter	Duration (mins)
1	Welcome speech and Project overview	Arch. Omer Unlu	15
2	Introduction of Consultants, Team Composition, Overall Objectives, Methodology and Work Plan	Prof. Uğurhan Akyuz	25
3	Questions and answers from the participants		90
4	Group Panel Discussion		
5	Concluding Remarks	Arch. Omer Unlu	10

Sr.	Discussion
1	Presentation for S-05 project done.
2	**Mr. Dr. Sarwar Jahan** said, Many of the structure in the city vulnerable in fact fire brigade structure so every ward should have Emergency Operation Center (EOC). **Mr. Dr. Ahmadul Hasan** replied to **Mr. Sarwar** this is the World Bank RAJUK component, there are disaster management component under the World Bank, also fire service and planning commission doing the different component. Finally it will be integrated. The thing EOC should be added as one of the component.
3	**Sayed Ashraf, CMS, Department of Disaster Management** said, • Medical Facility Department should be a stakeholder. • Airport authority is absolutely a different authority so it should be added. Specifically Sahajalal International Airport Authority should be added. • CDMP data is also a basis on earthquake as well as urban flooding. If all data especially geo-technical data (it is specially based on Dhaka city earthquake) is collected then it will be helpful. • Urban flood hazard data collection is one thing and impact assessment regarding flood is the different issue. That should be considered.
4	**Shaheen Ahmed, Senior Planner, Urban Development Directorate (UDD)** said, • When disaster happened Ministry of Home Affairs comes first to rescue so it should be added as a stakeholder. • Military also help to rescue people so Bangladesh Army should be added. • During the visual inspection it should be periodic maintenance. If it is not maintained properly than it will give different result. It could be consider.
5	**Mr. Dr. Raquib Ahsan** said, • We have lot of damage data but unfortunately we don't have any data in recent past because we did not have any significant damage in near past. • Historically Grate Indian earthquake 1897 there are some survey by British geological society and they have some publication. • Their damage data would not be relevant to the structure assessment purpose it relevant to understanding of density of earthquake. Their structure type, damage type are not relevant in terms of materials and strength of material. • In terms of damage data we do not have any damage data. • Regional damage data may be used in some extend in Guzrat, Vupal. That could be used in some types of structure but it not covered all category.
6	**Prof. Dr. Muhammad Qumrul Hassan** said, • We have epicenter in and around Bangladesh. • In Colombia University website there have jointly collaborate project of Dhaka University and Colombia University. • In Potsdam University, Germany, they have in and around data on their website. where you can collect 200 hundred year data.

Sr.	Discussion
7	**Prof. Dr. Abul Kalam Azad** said, In the master plan that is did by the RAJUK that could be important sources of the data.
8	**Mr. Tolga Sahin** asked Mr. Quader, what about Education Engineering Department? **Engr. Shah Naimul Quader** replied, • Education Engineering Department construct high school and they follow all the guideline of BNBC. • Recently they are constructed school building, college building and some new university like Barisal University, Rangpur University. • Some of these building typical. • There use different layout and plan for educational structure. • There always follow the latest instruction of the BNBC. • Building constructed by engineering department as per design and if it properly maintained than it will sustain lifetime which is 99 years.
9	**Prof. Dr. Muhammad Qumrul Hassan** asked Mr. Quader, how the foundation was and what about the site selection because most of the education building site in our country selected by the politician. **Engr. Shah Naimul Quader** replied, in building construction all time the soil condition is followed and there are different types of classification like costal area, flood affected area and urban area. There are 7 types of building under Engineering Department.
10	**Mr. Sayed Ashraf** added, the Prime Minister of Bangladesh gave the instruction to Educational Engineering Department in 1999 that all the educational building should be constructed according to the upper limit of flood level in 1999. But still some new universities constructed below the flood level 1999.
11	Conclude the meeting of S-5

Prepared By:	Approved By:
Planner Towhidul Islam Sheltech (Pvt.) Ltd.	

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- **Pictures**

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- **Participants Lists**

Date: 10-12-2018

MEETING ATTENDANCE SHEET

S-04 Vulnerability Assessment and Prioritized Investment Plan for Critical Assets in Dhaka

S-05 Development of Risk Sensitive Land Use Planning

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MEETING ATTENDANCE SHEET

S-04 Vulnerability Assessment and Prioritized Investment Plan for Critical Assets in Dhaka

S-05 Development of Risk Sensitive Land Use Planning

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MEETING ATTENDANCE SHEET

S-04 Vulnerability Assessment and Prioritized Investment Plan for Critical Assets in Dhaka

S-05 Development of Risk Sensitive Land Use Planning

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3.4.3 Project Implementation Concept Workshop

- **Pictures**
  - **Dhaka**

Dhaka workshop was held on October 2018.

- **Istanbul**

Workshop was held in the head office in Iran on December 2018.

3.4.4 Site visits

- **Buildings**
- **REPORT OF VISIT TO PROSOIL FOUNDATION CONCULTANT**

REPORT OF VISIT TO PROSOIL FOUNDATION CONSULTANT - DHAKA
Date: 11 December 2018

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8	Rafael Alaluf	NKY-PROTEK-SHELTECH-SDE	Vulnerability and Risk Assessment Expert
9	Samrad Ahsan	SDE	Geotech. Eng.
10	Zinan Umri	SDE	Geotech. Eng.

No.	Notes
1	Engr. Md. Shamsul Islam (Chief Executive) gave information and he made a presentation.
2	Photographs of the laboratory equipment taken.
3	They said that they have 24 rotary drillers. • One with 250 meters' depth capacity • 3 with 200 meters' depth capacity • Rest with 20 meters capacity
4	They said that they have • 0ne 10 ton ECPT • One 15 ton ECPT, 30 meters, in soft soil 40 meters
5	They said 20 ton ECPT, 70-80 meters FOX 150 may do 80-90 meters in soft soil
6	ECPT testing • 70 meters' depth 1 test per day • 20 meters depth, 3 test per day without problems

7	Regarding Downhole tests, separate boring should be done, maximum 15-20 meters depth achieved.
8	They said, they do not work on May, June, July, August, September and October.

- **Pictures**

- **Laboratories**
- **REPORT OF VISIT TO SDE – DHAKA**

REPORT OF VISIT TO SDE Laboratory- DHAKA
Date: 13 December 2018

ATTENDEES			
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3	Zinan Umri	SDE	Geotech. Eng.
4	Nayan Roy	SDE	Geotech. Eng.

No.	Notes
1	Mr. Nayan made a slide presentation.
2	SDE performed 6000 meters SPT drilling, testing and sampling and laboratory testing in 4 months.
3	SDE doesnot have Triaxial Compression test machine.
4	Samrat will take price quotation for SPT drilling, testing and sampling. SDE has 2 subcontractors who can supply 4-5 rigs. These rigs are not truck mounted. Easy to transport and handle at field. They are water wash type.
5	SDE has topographical team under Mr. Rubel.
6	SDE subcontractors have 3-4 auger drilling equipment.
7	Samrat said consolidation test takes 2 weeks. • SDE has 2 consolidation test equipment • BUET has 25 consolidation test equipment • PROSOIL has 5 consolidation test equipment • MIST has 8 or 10 consolidation test equipment
8	Samrat said, SDE has a Seismic Refraction Testing Machine. Same machine ia an MASW machine also.
9	Samrat will prepare estimated quantities of laboratory tests for 15 000 meters SPT boreholes.

- **Pictures**


- **Critical Infrastructure**
- **REPORT OF VISIT TO MIST (Military Institute of Science and technology)**

REPORT OF VISIT TO MIST (Military Institute of Science and technology) DHAKA
Date: 11 December 2018

ATTENDEES			
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10	Zinan Umri	SDE	Geotech. Eng.

No.	Notes
1	Colonel Md. Masadur Rahman (Head, Dept of Civil Engg. MIST) gave information about their activities. • He said that bedrock is 100 meters deep in some places in Dhaka. It is not less than 100 meters. • Engineering bedrock is about 70 meters. • Shear Wave Velocity is about 400 meters/second at 70 meters' depth. • Bedrock in Chittagong is 15 kilometers deep.
2	Photographs of the laboratory equipment taken.
3	MIST does not have drilling equipment. They do not have SPT, CPT, SCPT testing equipment. If required, they can employ subcontractors who have such equipment for field testing and sampling.
4	MIST does not have geoelectrical testing equipment.

- **REPORT OF VISIT TO BUET – DHAKA**

REPORT OF VISIT TO BUET - DHAKA
Date: 11 December 2018
Date: 13 December 2018 (S. Sezer and Samrat)

ATTENDEES			
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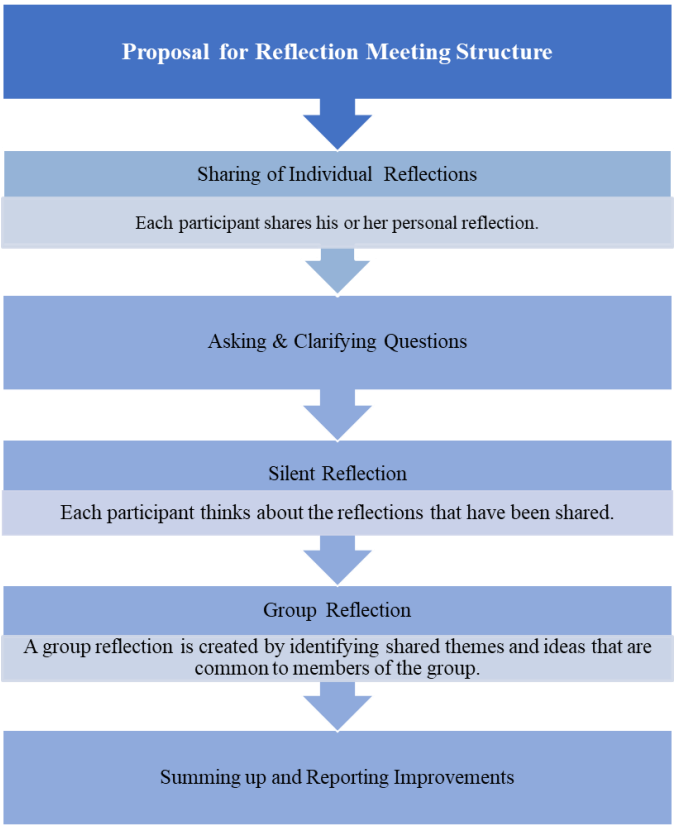
7	Mehmet Yildiz	NKY-PROTEK-SHELTECH-SDE	Logistics & Admin
8	Rafael Alaluf	NKY-PROTEK-SHELTECH-SDE	Vulnerability and Risk Assessment Expert
9	Samrad Ahsan	SDE	Geotech. Eng.
10	Zinan Umri	SDE	Geotech. Eng.

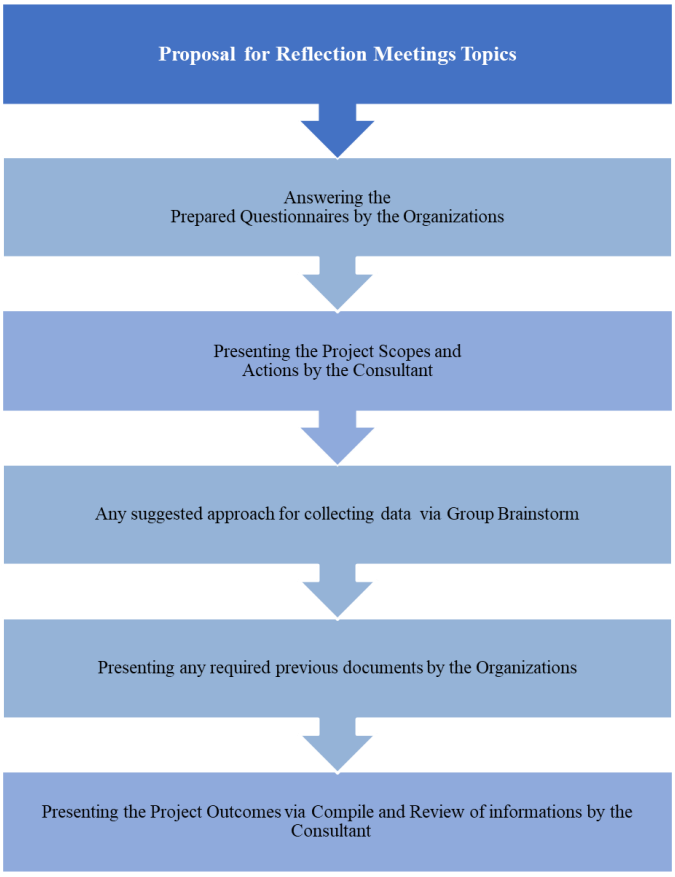
No.	Notes for visit on 11 December 2018
1	Dr. Ansary said they have a 20 ton CPT machine which can go 60 meters depth in soft soil. In stiff soil it can be pushed 12 meters.
2	Dr. Ansary said July-August-September are non-working months because of heavy rain.
3	Dr. Ansary said, one CPT machine can make 2 CPT+2 SCPT tests per day.
4	Dr. Ansary said, MASW and SASW tests are not necessary
5	Dr. Ansary said they can do Refraction and Reflection tests. They have microtremor. They have one testing machine (equipment) with one reflection and one refraction sensor.
6	They have: • 4 No static triaxial compression testing machines • 2 No dynamic triaxial compression testing machines • 3 No Direct Shear Testing machine • 20 No consolidation testing machines

No.	Notes for visit on 11 December 2018 (S. Sezer and Samrat)
1	The CPT equipment BUET have is a brand new one.
2	They said, PROSOIL has only one CPT equipment. (S. Sezer: to be confirmed, because PROSOIL said they have more ECPTu (ESCPTu) equipment, still in boxes)
3	There is another CPT equipment belonging to Government.
4	BUET can do 400 microtremor tests in 4 months.
5	Samrat said, Dr. Ensary or Dr. Raquib can make a Borehole Location Plan for microzonation.
6	Dr. Ensary said that the below listed work items should be done by the JV: • Taking permissions for field testing from RAJUK • Site clearance (preparing access and levelling the ground where necessary) • Marking Locations of Boreholes
7	Dr. Ensary said transportation of the CPT equipment with a tractor is their responsibility.
8	Dr. Ansary said, washboring can be used, it will be cheap. Rotary drilling is expensive.
9	Samrat will collect data from SDE and BUET and send to S. Sezer.
10	S. Sezer asked to Dr. Ansary, who from RAJUK will approve the drilling and testing equipment, what is the name of this person? Dr. Ansary said, possibly RAJUK will ask him to review any such submittals.

3.4.5 Future Reflection Meetings

It is necessary for the previous documents to be presented to the study group. In this order, reflection meetings must be held by the consultant in order to provide group brainstorm while identifying its environmental expectations the result of which will be announced to the study group. The structure of these meetings, as well as the topics discussed and interviewed, is set by the study group. Reflection meetings will result in "What to be announced to the study group"





In "Annex B" you will find a detailed questionnaire which will be used in order to develop a risk sensitive land use planning database that will have to implement by the stockholders at the pilot area prior to reflection meetings. The purpose of the questionnaire is to:

a. Create a better understanding on the expectations and objectives of the individual partners regarding the methodology;
b. Collect information concerning the existing situation in each individual institution regarding the legal requirements and the methods they have been using for assessing and mapping risk;
c. Examine the availability and accessibility of data that are essential to implement the risk assessment and to produce risk maps and;
d. Provide a basis for developing the new risk assessment methodology.

3.5. Challenges and Important Outcomes of the Meetings

Following Key challenges has been identified as critical and have crucial importance for successful implementation of the project.

3.5.1 Duration

The duration of 36 months is sufficient enough to carry out all the activities within the responsibility of our JV in accordance with ToR requirements and our methodologies. However, during the kickoff meetings and bilateral meetings with PIU a specific request was made if a fast track of the activities would be possible. Our teams have extensively studied the work plan and deliverables and have reached to following conclusion:
The duration of the 36 months can be reduced to 30 months- the quality of the outputs and achievements will remain the same- with the understanding and acceptance of following terms:

1) The data required which has been stated in Chapter 3 of this report shall be immediately provided.
2) The duration for the approval of the reports from the PIU/WB shall be limited to 10 days.
3) The additional staff/individual consultants/sub-contractors may require and the consultant will provide as required. No extra charge for these consultants will be requested however the expectation from PIU is to facilitate their utmost assistance to timely provide the payments in accordance with the revised work plan of

3.5.2 Deliverables provided in Chapter 6.

1) Facilitation from PIU for getting necessary approval from the relevant authorities. Especially providing necessary permissions have crucial importance.
2) With the workplan provided we have aimed to have a deliverable/financial progress of at least 40% by July 2019 and 75% by July 2020 while we have aimed to complete project by June 2021.
3) Data Validation and Security
4) Data Validation is important part of the project success and PIU is expected to assist our JV for establishment of the Project Working Group and Project Oversight Committee. The responsibilities of PWG along with the core team of JC in Dhaka will be validation of these data.

3.5.3 Lack of Technical Capacity

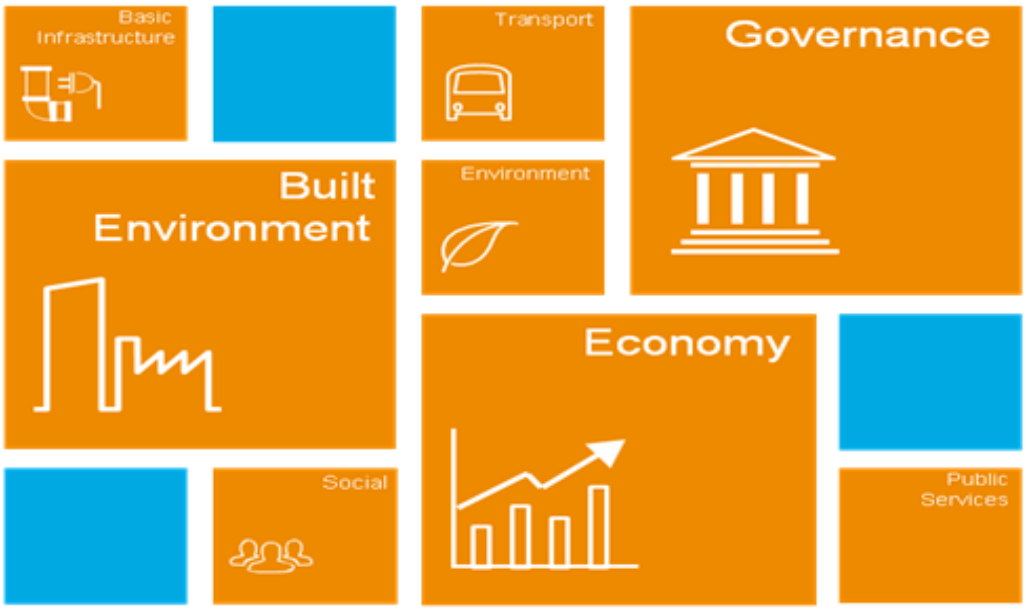
One of the aims of the project outcomes is capacity building and training of the national staff on the outcomes of the project. In that sense we have come to understanding that this is a big challenge that we need to overcome. A successful project should have sustainability and resiliency so that we expect the technical teams of PIU and relevant stakeholder be part of the project and have close cooperation with our experts in the ground. We do as well believe that international workshops to see best practices has crucial importance so that we hereby state our readiness to provide a workshop in Turkey for Bangladesh stakeholders and PIU to show best practices.

4. Methodology for Technical Activities

4.1. General

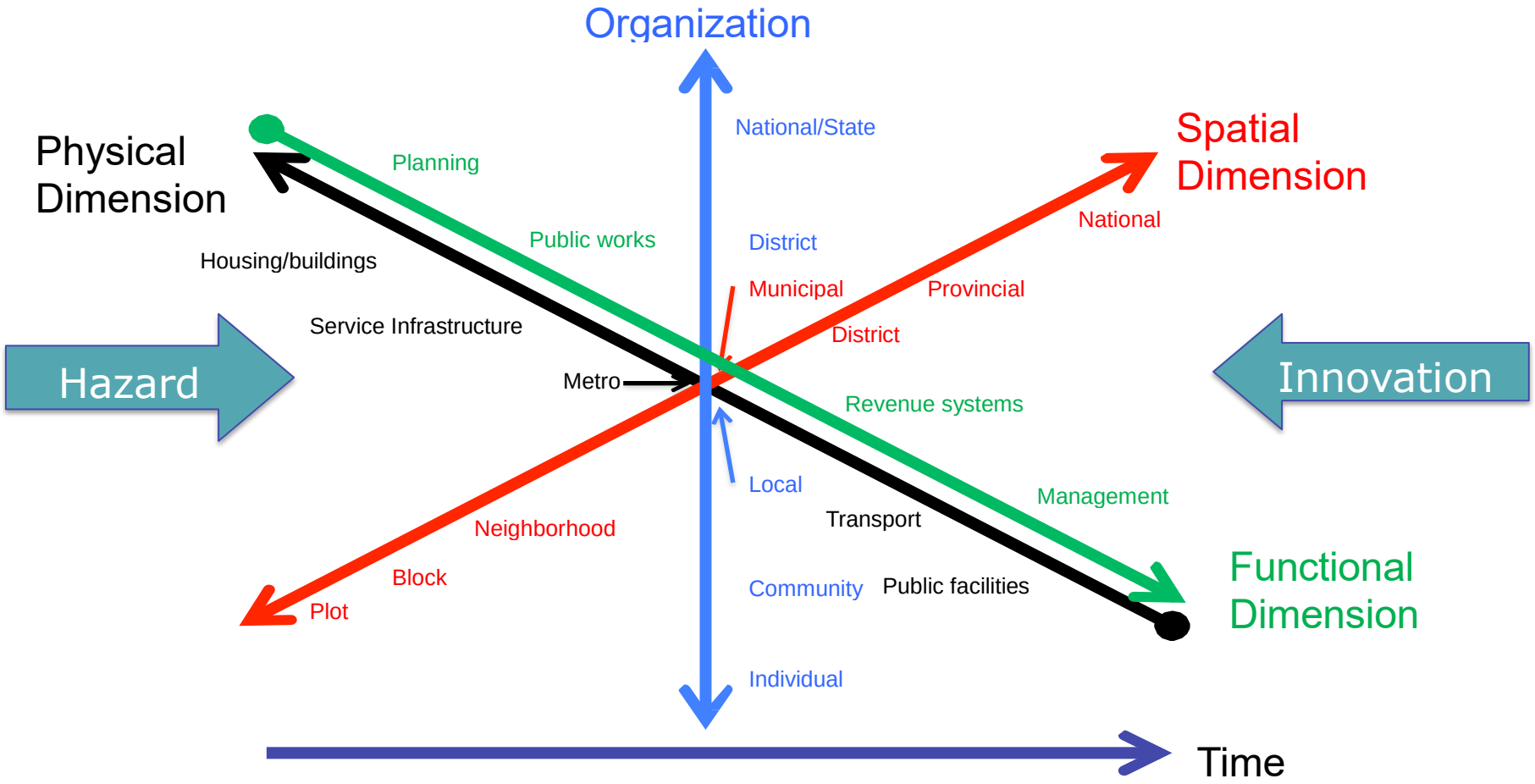
The JV has extensive experience in carrying out such activities in particular using international know-how will bring a new initiative in land use planning. The principles of the Guidelines prepared by EMA along with the "Risk Sensitive Land Management guidelines of UN-Habitat" will create basis for the methodology to be followed.

There is a need in disaster risk management to recognize the relationships between population growths, the physical demands of human settlement, economic planning and the most appropriate use of available land. The application of informed and consistent planning practices is crucial to minimize the potential loss of physical assets and environmental capital. Both the opportunities and the difficulties of employing land-use and planning practices for disaster risk reduction along with examples of risk-sensitive land use planning initiatives are reviewed. The components to be considered by JV will be as following:



Land-use planning that is carefully designed and rigorously implemented is the most useful approach to managing urban population growth and minimizing associated risks. It is also one of the most challenging to implement because of conflicting values held about land by different segments of the population. Risk sensitive land-use management is complex by its nature and involves legal, technical, and social dimensions. The consultant shall consider all these dimension during conducting situation analysis and diagnosis.

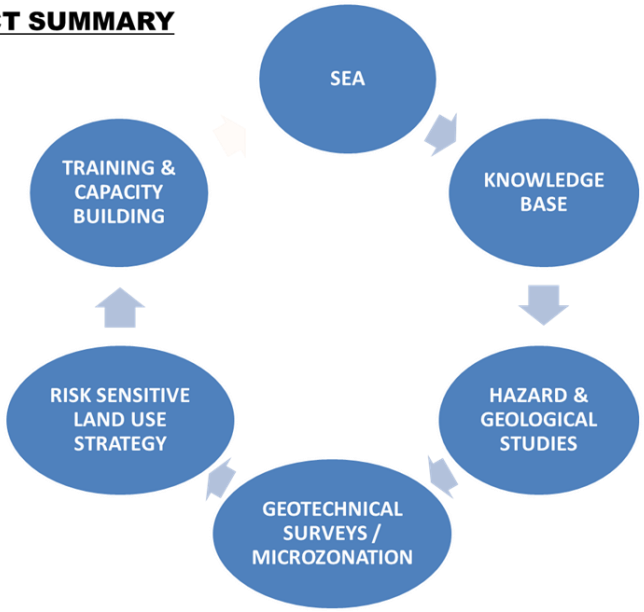
Urban System Model

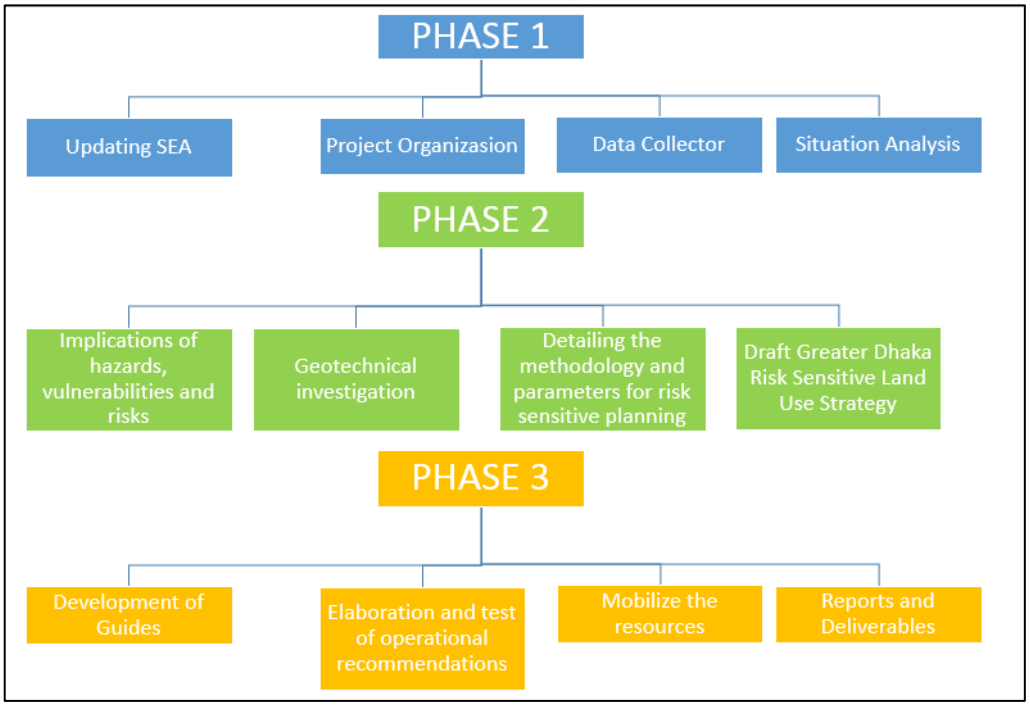


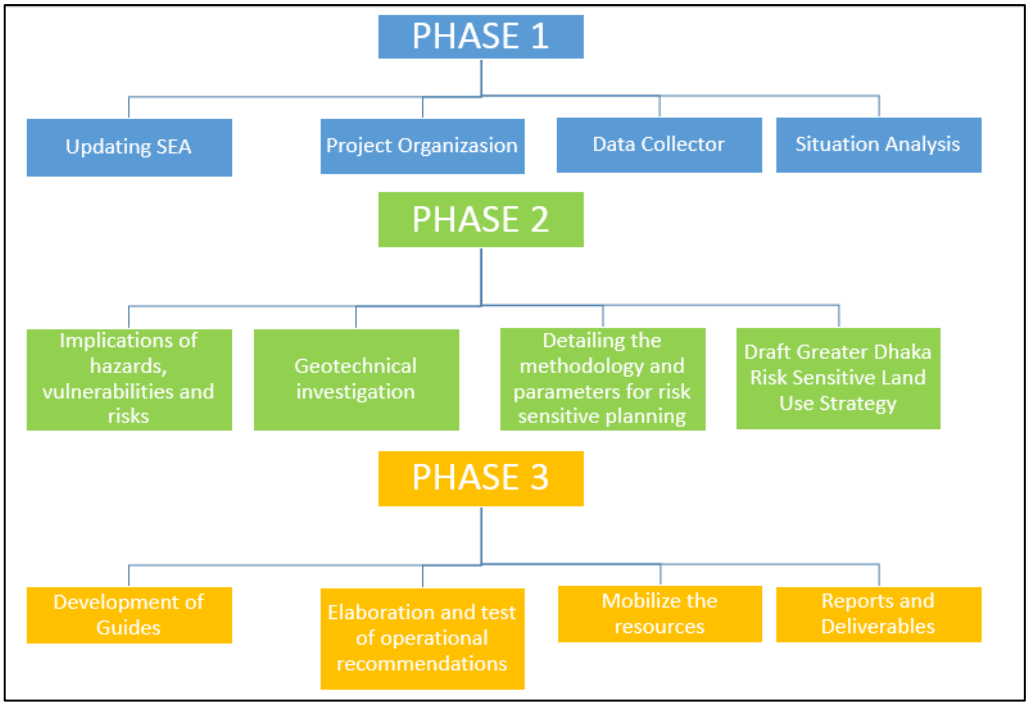
Deciding how to use land is demanding enough. It is even more daunting if there are competing views about the role that land should play in reducing collective exposure to risk. Considerations invariably revolve around whose land it is, whose risk is involved and who is to benefit. Too often, the desire for short-term gains override anticipated benefits that stretch further into the future.

This project will design and propose a land use planning investigation process and procedures that shifts towards risk-sensitive planning, investment programming and implementation. This requires designing procedures, indicators and criteria on how to assess and improve current town- planning structures, practice and processes. The engagement shall look into the planning process and identify key entry points of DRM mainstreaming in the plan formulation, in investment programming and implementation.

PROJECT SUMMARY



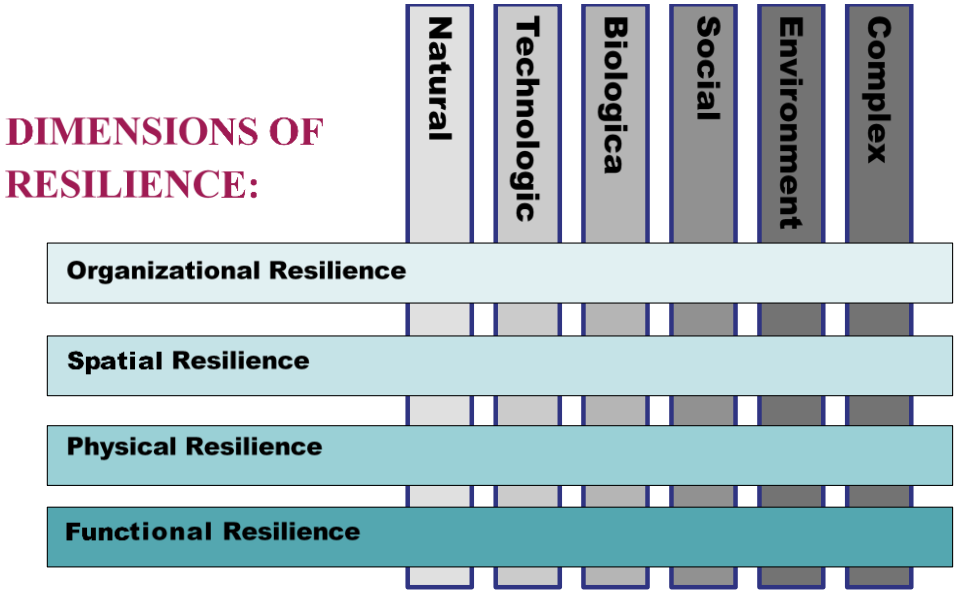




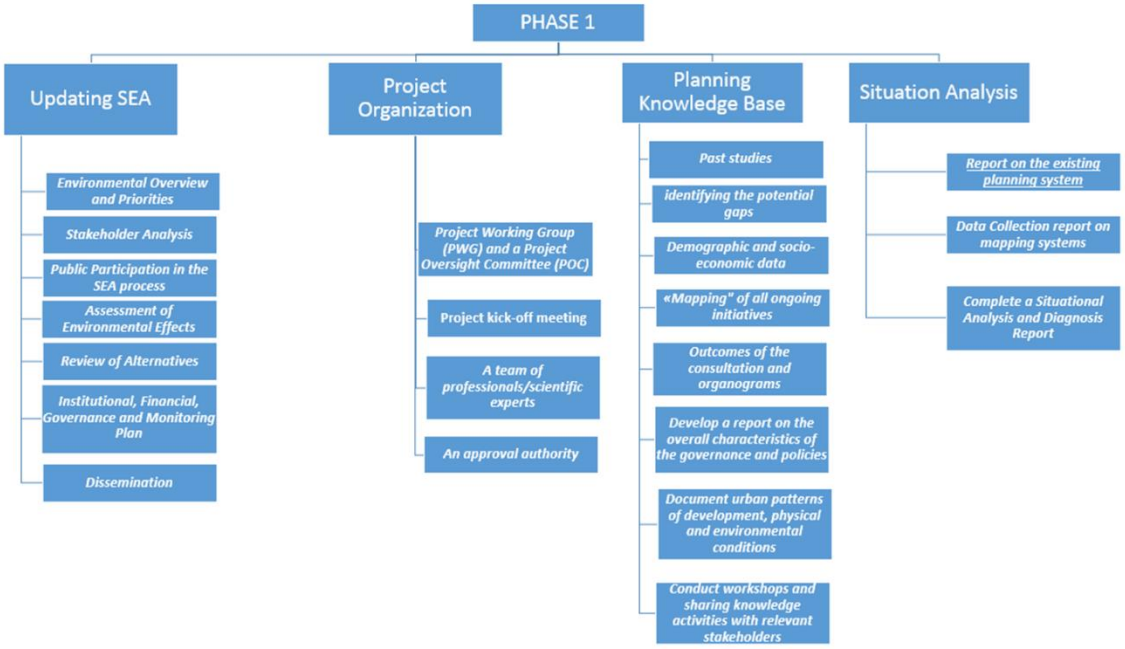
4.2. Scope of Work for Methodology Basis

This methodology has been designed based on the requirements of Project ToR. The steps of the engagement can be summarized as following:

1. Develop and train RAJUK's town-planning professionals and related specialists
2. Review relevant past studies in Bangladesh
3. Provide analytical research and methods as well as data collection and validation tools
4. Conduct a city wide geotechnical and geological studies
5. Conduct stage 1 activities including Project Organization, Data Collection, and Situation Analysis
6. Conduct stage 2 activities including Development of the internal guidelines and processes for RSLUP
7. Conduct stage 3 activities including Training and Capacity Building for risk-sensitive planning



4.3. Stage 1



4.3.1 Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is the process of evaluating the environmental impacts of proposed policies, plans or programs, in order to inform decision-making. SEA should start as early as possible within the decision-making process.

Strategic Environmental Assessment (SEA)

- Minimize any negative impacts of the preferred strategic action.
- Maximize positive impacts.
- Improve the strategic action.
- Enhance the environment where possible.

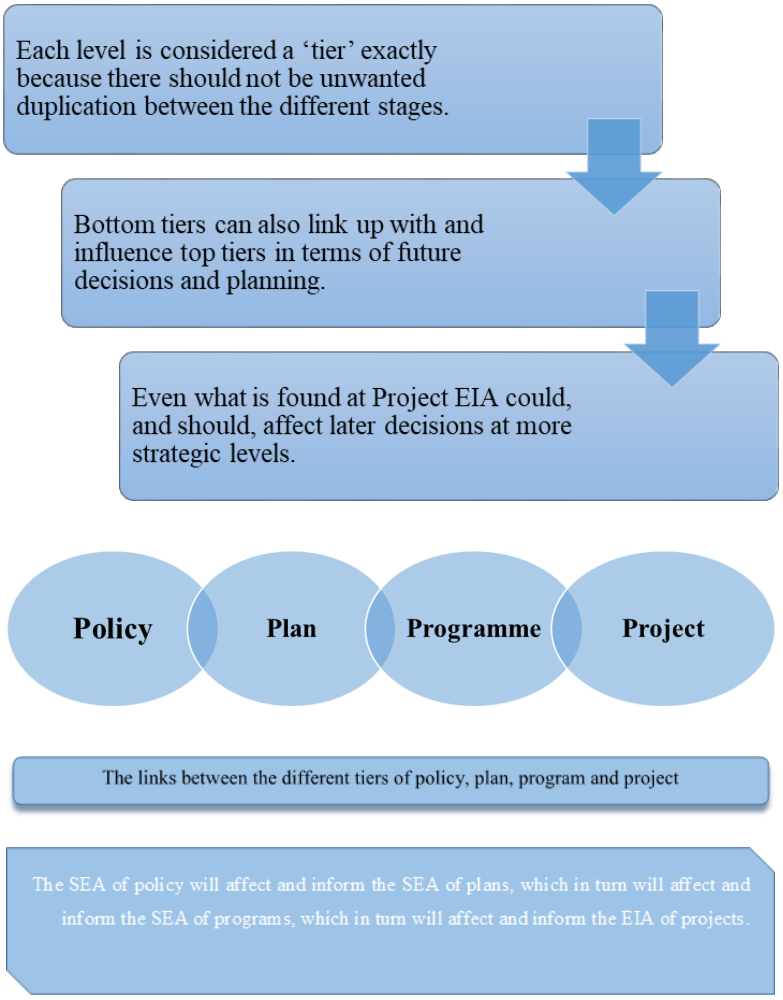
Strategic Environmental Assessment (SEA) Benefits:

- SEA allows for a wider consideration of impacts and alternatives.
- SEA is a pro-active tool that can be used to support strategic action formulation for sustainable development.
- SEA can increase the efficiency of tiered decision-making (including strengthening of Project EIA).
- SEA allows for a systematic and effective consideration of the environment at higher tiers of decision-making.
- SEA can help to achieve, clearer, more environment- friendly and more publicly acceptable strategic actions that are approved more quickly.
- Finally more consultation and participation of the public takes place.

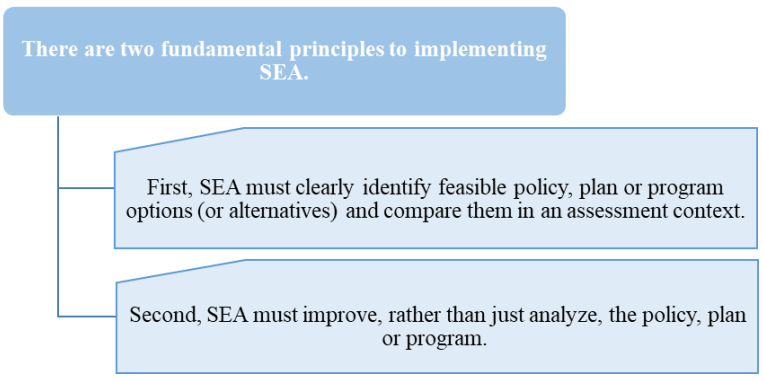
Strategic Environmental Assessment (SEA) Achievements:

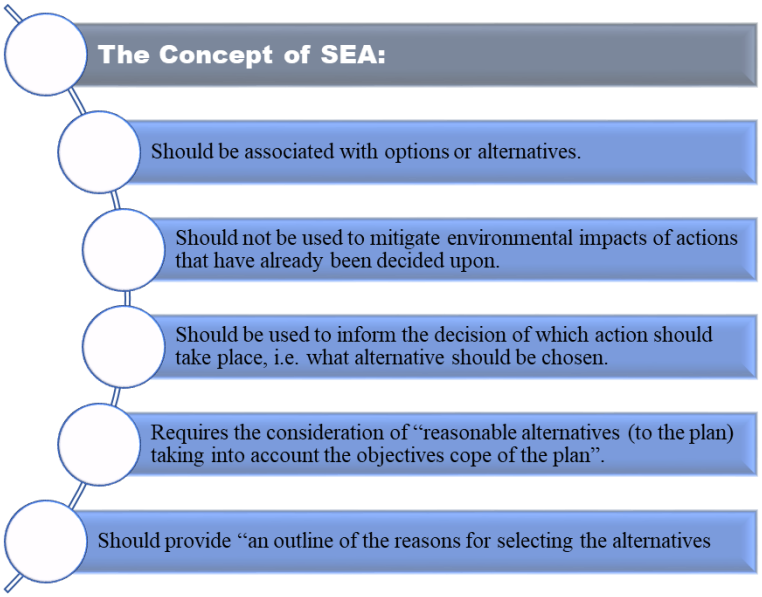
- Influences occur right from the start in improvement of objectives.
- Reshape the strategic action objectives so that it includes environmental and sustainability issues.
- Develops new options, or requirements and terms of reference for EIA of certain types of projects.
- Contributes the improvement of the strategic action not only by mitigating negative impacts but also by enhancing positive impacts.
- A tool for improving the strategic action, irrespective of the fact the strategic action has mainly negative or mainly positive impacts.
- Not a post-hoc 'snapshot' and should be started early, be integrated in the decision-making process, and focus on identifying possible alternatives and modifications to the strategic action.
- Allows the consideration of a wider range of enhancement measures at an earlier stage of decision-making.
- Part of being innovative in strategic-decision making is reflected in the kind of alternatives that are considered.
- Has always been a process of making choices between different potential ways to handle different issues

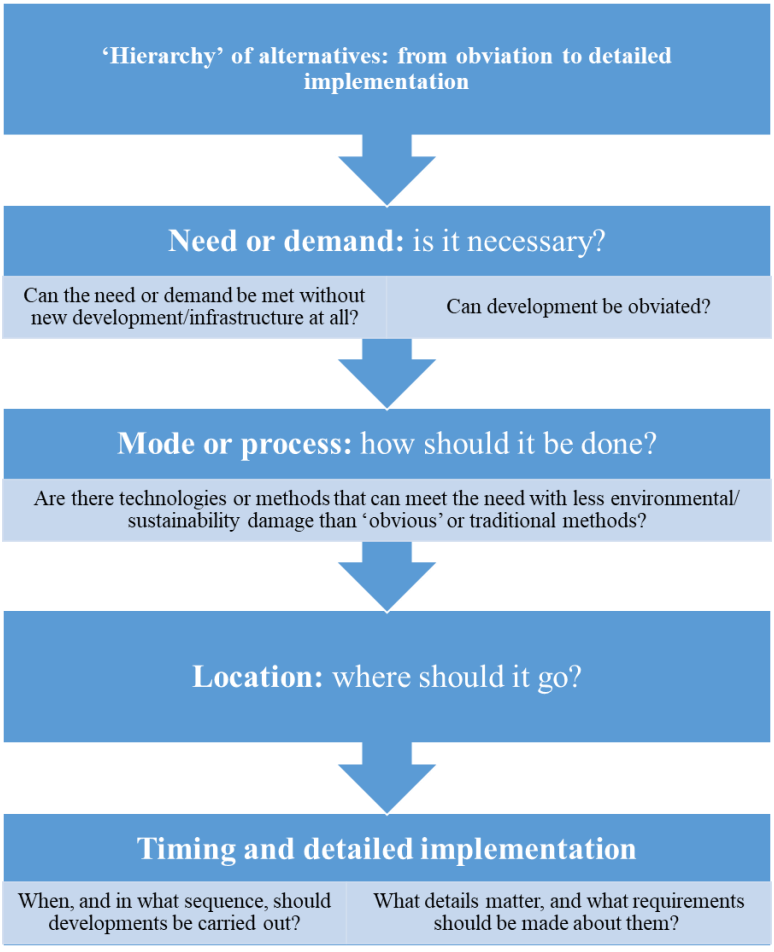
The linkage between levels of SEA to Project EIA is called 'Tiering' which means that aspects of decision-making and SEA carried out at one level do not necessarily need to be subsequently revisited at 'lower' levels, so that "Tiering can potentially save time and resources.



4.3.1.1 Two Key Principles of SEA

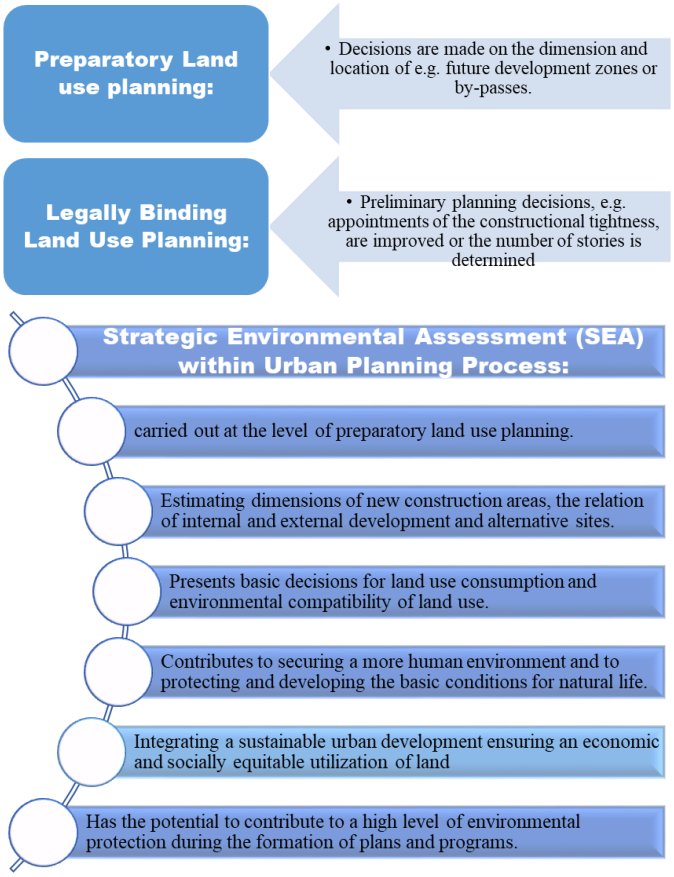


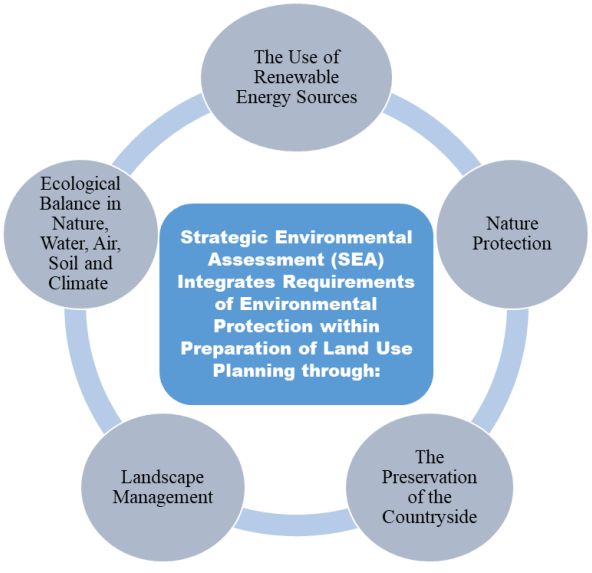

The Concept of SEA:
Should be associated with options or alternatives.
Should not be used to mitigate environmental impacts of actions that have already been decided upon.
Should be used to inform the decision of which action should take place, i.e. what alternative should be chosen.
Requires the consideration of "reasonable alternatives (to the plan) taking into account the objectives cope of the plan".
Should provide "an outline of the reasons for selecting the alternatives


'Hierarchy' of alternatives: from obviation to detailed implementation
Need or demand: is it necessary?
Can the need or demand be met without new development/infrastructure at all?
Can development be obviated?
Mode or process: how should it be done?
Are there technologies or methods that can meet the need with less environmental/ sustainability damage than 'obvious' or traditional methods?
Location: where should it go?
Timing and detailed implementation
When, and in what sequence, should developments be carried out?
What details matter, and what requirements should be made about them?

4.3.1.2 Urban Planning and SEA

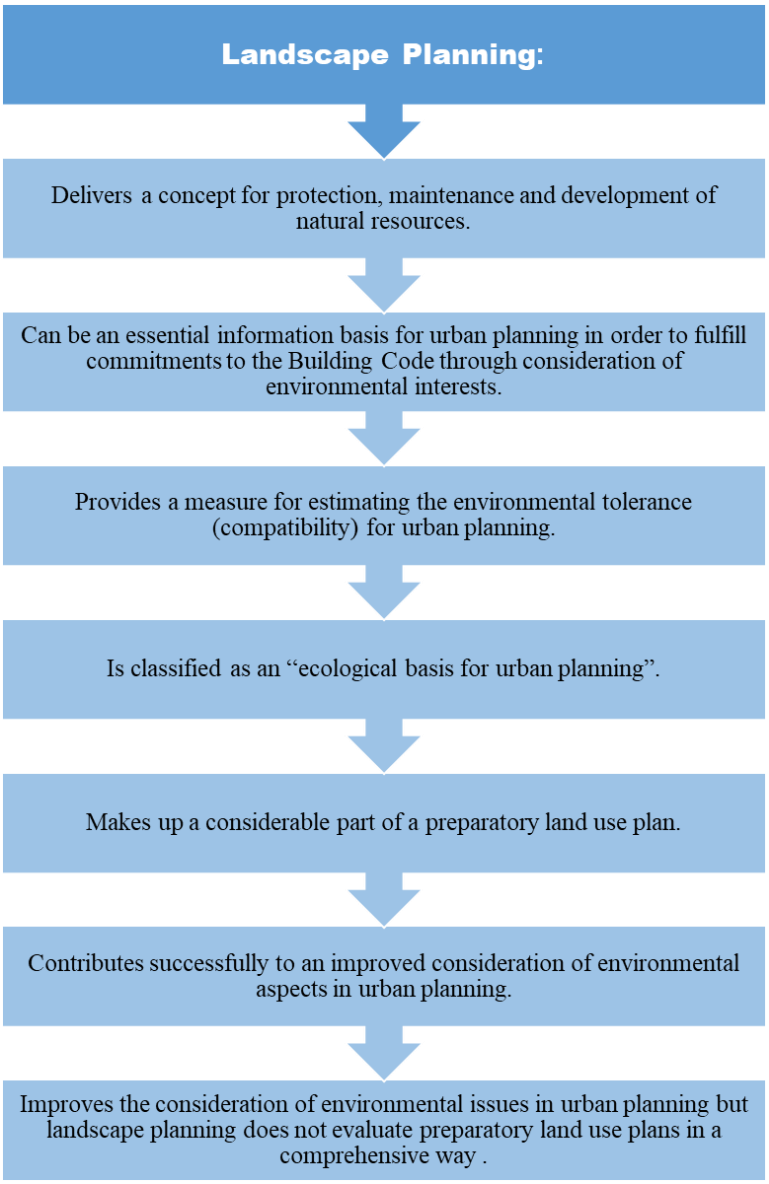
The urban planning ensures a sustainable urban development by preparing urban area developments in communities for the next years. The process is divided into two levels:





4.3.1.3 Relation of Landscape Planning and Urban Planning

Landscape planning is a special planning for nature conservation. Consideration of environmental aspects in the preparatory land use plans result in an environmentally "safe" choice of sites for settlement enlargements.
SEA requires an early "integration of environmental considerations into the preparation and adoption of plans and programs", "clearly documented" and "extensive environmental assessment" of plans and programs. In addition to the aspects on "human health" and "culture and real assets" the timing, the complexity and the documentation of an environmental assessment are the essential differences between SEA and the current urban planning procedure.



4.3.1.4 Scope of SEA Work as ToRs

Task 1: Environmental Overview and Priorities

- Presentation of Previous Documents to the Study Group.
- Holding Reflection Meetings by the Consultant
- Performing a Preliminary and Brief Scan of the Project Existing Situation Addressing:
    - Problems, Gaps and Issues
    - Limitations and Capabilities
- Compile and Review information on Project at the National and Municipal Level.
- Preparation of a Baseline Study in the Region

Task 2: Stakeholder Analysis

- Identifying Main Actors and Beneficiaries Including public and private stakeholders Including:
    - Development Agencies
    - Planning Agencies
    - Municipal Agencies
    - Civil Society Organizations
    - NGOs
    - CBOs
    - And Groups that may Impact on the Project Implementation
- Analyzing their Interests and Incentives
- Review their Roles, Mandates and Linkages

Task 3: Public Participation in the SEA process

- Establishing a Participatory Plan for the Project
- Establishing a Timeframe for the Processes within the Project
- Determining Concerns and Priorities Related with the Implementation of the Project
- Determining the Scope of Action in the Project

Inception Report Preparation

Task 4: Assessment of Environmental Effects

- Determining the likely significant environmental effects, both risks and opportunities, associated with the implementation of the Including:

- Construction and retrofitting
- Biodiversity
- Population
- Human health
- Soil, Water, and Air
- Climatic factors
- Material assets
- Cultural heritage including architectural and archaeological heritage
- Landscape

- This will comprise two stages:
  - **First:** Determination of likely significant environmental effects for each project under component B by assessing its potential effects on the environmental concerns and priorities identified as a result of "Task 1".
  - **Second:** Evaluation of cumulative and expected indirect effects of URP in the Dhaka Metropolitan area considering environmental effects in the short and long-term.

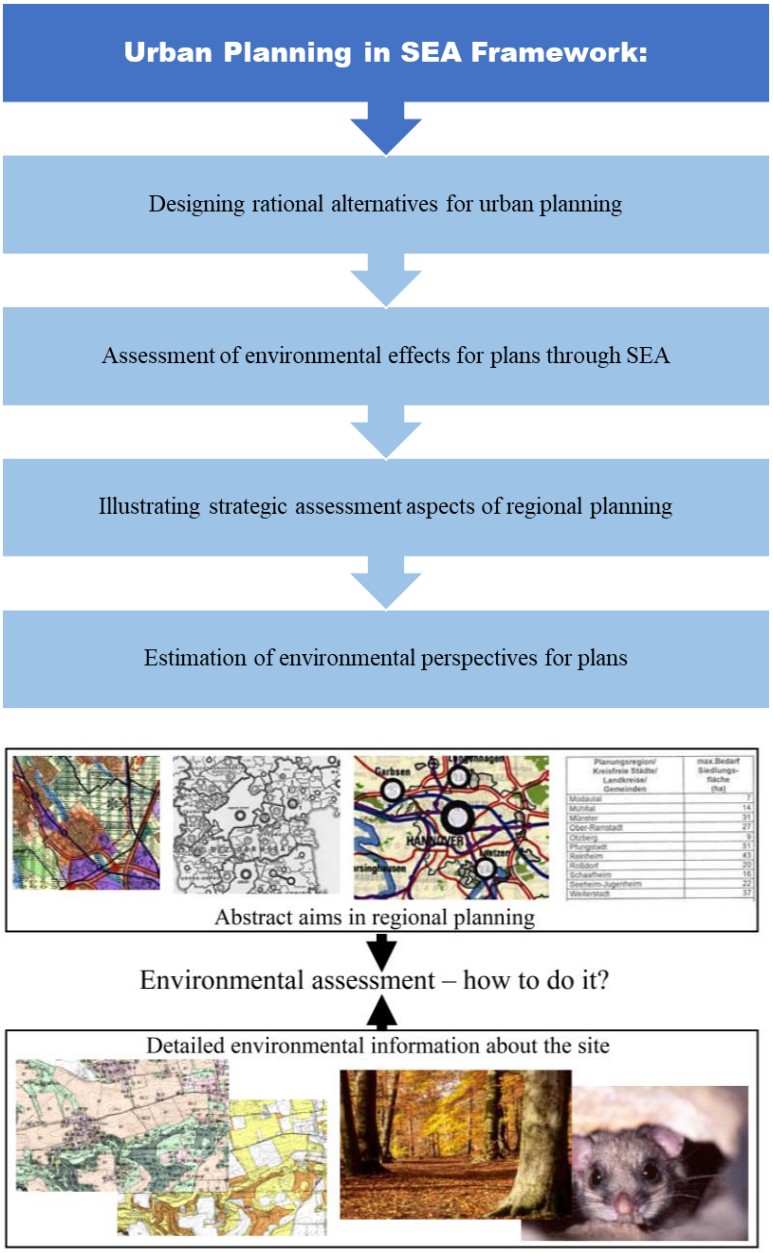
Task 5: Review of Alternatives

- Suggesting environmental based alternative implementation scenarios for the Component B upon the results of the prepared assessment and available practices and models for urban planning and development
- Presenting scenarios as much as possible quantitatively, including the main linkages and trade-offs between economic, social and environmental aspects of the proposed alternatives for Dhaka's urban development.
- Evaluation of proposed scenarios comprising an institutional and expenditure review of the additional capacities and financial resources.

Interim Report Preparation Results in:

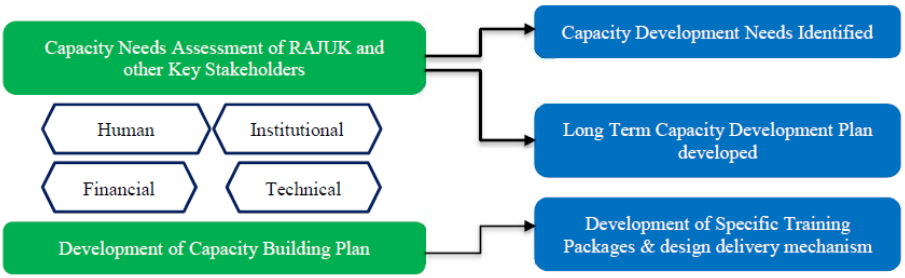
- Assessment of environmental effects on the plan, description and arguments / reasons
- Documentation of considered objections and support representation on environment matters
- Reasons/arguments for decisions

- Designation/statement of environmental monitoring
- Strategic alternatives and assessment of site alternatives
- Reasons for assessed alternatives/ kind of assessment/ consideration



Task 6: Institutional, Financial, Governance and Monitoring Plan

- Formulate a plan for institutional strengthening, capacity building, financial and governance requirements for the implementation of the alternative selected by RAJUK following a consultation process with key stakeholders.
- Including the environmental monitoring measures of the URP in order to identify unforeseen adverse effects at an early stage, and to be able to undertake appropriate remedial action.



Task 7: Dissemination

- Presenting comprehensive conclusions and recommendations to the key institutional counterparts including a non-technical summary of the SEA report
- Socializing the key findings and recommendations of the SEA with the main stakeholders through:
    - City level workshop: broad range of central, city and local government institutions and civil society organizations
    - Focus group discussions: community groups
    - Local workshops: special/marginalized groups
    - Formal and informal village meetings: residential groups in the project area

Draft Final, Consultations Report; and Final Report Result in:

- Completion of design and finalization of land-use plan accepted through RAJUK
- Final assessment of approved land-use plan through social and economic considerations
- Presenting and socializing framework and reports

4.3.2 Data Collection

Available data and information on existing land use and land cover and changes will be gathered by JV partners from different sources. Detailed information on and the local land use planning will be generated during the ground surveys through consultative process like enumeration, observation and questionnaire surveys.

1- GEOGRAPHIC DATABASE DEVELOPMENT						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	Satellite Image	GeoEye_BTM_Everest1830	GIS	GIS		
2		GeoEye_BTM_EverestBangladesh	GIS	GIS		
3		GeoEye_Clipped_BTM	GIS	GIS		
4		GeoEye_Image_Raw	GIS	GIS		
5		GeoEye_Ortho-Rectified__UTM	GIS	GIS		
6		GeoEye_UTM	GIS	GIS		
8	ADPC MRVAM Atlas Data	Base Data	GIS	GIS		
9		Earthquake	Exposure, Hazard and risk	GIS		1,8
10		Flood	Exposure, Hazard and risk	GIS		1,8,9
11		Layer File	Flood,Storm Surge,Landslide,Drought,Earthquake	GIS		1,8,9
12		MRVAM Final Report Vol-I	Report on Multi-Hazard, Risk and Vulnerability Assessment, Modelling and Mapping in Bangladesh Volume I: Hydro-meteoroloGISal Hazard Assessment (Flood, Storm Surge, Landslide and Drought) Identify, assess and monitor disaster risks and enhance early warning	PDF	1,4	1,8,9,18
13	DNCC	GIS	Sand Fill_Aminbazar	GIS		
14		Photos	Sand Fill_Aminbazar	JPG		
15	GSB Data	GSB purbachal shape	GIS	GIS		
16		GSB2RAJUK	GIS	GIS		
17		GUD Project	Geo-Information for Urban Development, Bangladesh Strengthening the urban planning and development processes incorporating	GIS & PDF	19	18,1,8,7
18		RAJUK	GIS	GIS		
19		Fault_Lineament Map	faults and lineaments map of bangladesh with earthquake epicenters	PDF	19	18,1,8,7
20		Geology_Dhaka	GeoloGISal survey of Bangladesh	PDF	19	18,1,8,7
21		Geomorphology_Dhaka	GeoloGISal survey of Bangladesh	PDF	19	18,1,8,7
22		Surface wave	Shear Wave Velocity Mapping at Selected Sites	Word	19,4	1,8,18,7
23	Halcrow Plan	GIS	GIS of Halocrow	GIS		
24		Photos	Photos of Halocrow			
25	Road Master Plan	Beribad	GIS	GIS		
26		Dhaka_Bypass	GIS	GIS		
27		GIS	GIS	GIS		
28		N8_polyLine	GIS	GIS		
29		Map	Maps of roads and Highways	JPG		2,12,18
30		RoadMasterPlan	Road Master plan Road Network Improvement and Maintenance Project results of consulting services for the Preparation of a Road Master Plan under the Road Network Improvement and Maintenance Project-II	PDF		2,12,18,19

31	GIS Data	GIS Data for Drainage Master Plan	GIS	GIS		
32		GIS_Data_05.10.2017	GIS of Drainage, Sewer, Water	GIS		
32	CDMP	CDMP	Building, Chittagong, Eletric Power, Essential Facilities Transportation, Waste Water	GIS		20,713,2,3, 12,17,16,15
31	HydrologISal Study RAJUK Area	Data	GIS	GIS		
32		Report	Flood Hydrology Study for the Western Part of Dhaka Metropolitan Area assessment of overall flood hydrology in and around greater Dhaka city considering the north central part of Bangladesh	PDF	4,20	19,7,1,8,18,9
33		Data	GIS	GIS		
34		GIS	GIS	GIS		
35		Maps	Innundation Maps	JPG		
36		Report	Flood Hydrology Study of the Eastern Part of Dhaka Metropolitan Area to understand the flooding and drainage characteristics under existing and planned land use change	PDF	20,4	18,1,8,9,7
37		Report	Flood Hydrology Study for the Western Part of Dhaka Metropolitan Area assessment of overall flood hydrology in and around greater Dhaka city considering the north central part of Bangladesh	PDF	4,20	19,7,1,8,18,9

2- GEO-HAZARD ANALYSIS						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	Hydrology	Hydrology Working paper - V 1.3	OUTLINING WATER MANAGEMENT PLAN	Word	_	13,7,3,2,18
2		Hydrology - Flood modeling of DAP area	FLOOD HYDROLOGY STUDY FOR DAP 2016 – 36	Word	_	7,9,1,8,18
3		Manning's n Values - Chow	Reference tables for Manning's n values for Channels, Closed Conduits Flowing Partially Full, and Corrugated Metal Pipes	PDF	_	7,9,1,8,2
4	Environment	Annex-7 Plants in Urban Area	Incorporation of Plantation in Building Construction Rules	word	_	20,6,18,1,8
5		DAP Wetland and ESA 13.01.2018 SC - 01.03.2018 - 02.03.2018	Multi-criteria investment project (LP 11, LP 12) in EcoloGISally Sensitive Areas and Wetland	word	_	13,7,18
6		Dap Wetland Evaluation 26.02.2018	pose Business Investment Project In EcoloGISally Sensitive Area and '	word	_	13,9,18,8
7		Environment and Disaster Preparedness_Afzal	Disaster and Environmental Responsiveness	word	_	18,1,8,7
8		MixedUseDevelopment_Afzal	Benefits of Mixed Use Development	word	_	18,2,7,3,7
9		Preservation of water bodies on Dhaka	Preservation of water bodies on Dhaka	word	_	13,7,1,8
10		Solid Waste Management_Afzal	Waste Management in Dhaka: Areas of Concern	word	_	13,7,18
11		Wetland	Identification of causes, impacts and remedies to wetland reduction	word	_	7,18,13
12		wetland valuation	TOTAL ECONOMIC VALUE OF WETLAND	PDF	_	7,18,13
13	Internal Working Paper	Hydrology_Working paper - V 1.1	Outlining water management plan	word	4	13,18,1,8,7,2
14		Case study-02 Drainage Water logging and Waste Disposal	because of rapid growth, most cities and towns are unable to cope with changing situations due to their internal resource constraint and management limitations	WORD	4	7,18,13
15		Format Housing for Disadvantage Group	Questionnaire	WORD	4	20,18
16		Format Solid waste	Questionnaire	WORD	4	18,7
17		Format Water Logging	Questionnaire	WORD	4	7,13
18		Introduction	The problems that are mentioned in the ToR	WORD	4	20,7,13,2,3
19		Waste disposal flowchart	Flow chart of proposed solid waste management system	WORD	4	7,18,13
20		Waste disposal flowchart	Flow chart of Solid Waste Management System of Savar Pourashava	Word		
21		WaterAct_2013	Bangladesh water act. An act to make provisions for integrated development managrment, abstraction, distibution, use, protection and conservation of water resources	PDF		18,7,13

22	ADB Resilience Project	3. Gopalganj Climate Resilient Integrated Urban Plan_Print	Developing Integrated Urban Development Plans in Selected DMC Cities Incorporating Urban Climate Change Resilience Principles, GOPALGANJ	PDF		7,918,3
23		3. Gopalganj Rapid Urban and Climate Change Assessment_Print	URBAN CLIMATE RISK PROFILE	PDF		7,918,3
24		3.Gopalganj First Five Years	ACTIONABLE PRIORITIES FOR FIRST FIVE YEARS OF IMPLEMENTATION OF THE CLIMATE RESILIENT INTEGRATED URBAN PLAN	PDF		7,918,3
25	FAP Report	FAP - 3	North Central Regional Study FAP - 3 Flood Action Plan (FAP) Regional water resources development plan	PDF	4	18,1,8,2,3,7,9 ,13
26		FAP -15	Land acquisition and resettlement study to assess the social and economic impacts of land acquistition (LA)	PDF	MARC	18,72,3
27		FAP-8 A	FEASIBILITY STUDY ON GREATER DHAKA PROTECTION PROJECT Flood Action Plan (FAP)	PDF		18,1,8,2,3,7,9 ,13
28		Final_submitted-SDMP_10.10.16	Updating/Preparation of the Stormwater Drainage Master Plan for Dhaka City		13,4	9,2,3,18,7
29		Master Plan Report-Final-29.01.13	Updating/Preparation of Sewerage Master Plan of Dhaka City and Preparation of Detail Design & Bidding Documents for Priority Works for Existing Sewerage System of Dhaka City	Word	13,4	9,2,3,18,7
30	GIS	GIS	GIS	GIS		
31	Photo	Photo	MODS Zone	JPG		
32	Water Supply Master Plan (Final Report)	Volume- 1	DHAKA WATER SUPPLY AND SEWERAGE AUTHORITY Water Supply Master Plan for Dhaka City Main Report	PDF		13,18,2,3
33		Volume- 2	Existing Situation Analysis Report	PDF		
34		Volume- 3	Demand Assessment Report	PDF		
35		Volume- 4	Resourse Assessment, Financial Assessment & SEA Report	PDF		
36		Volume- 5	Primary and Secondary Distribution Networks of Padma	PDF		

37	Density Zoning	Dhaka Sewerage Master Plan	to determine a phased implementation plan identifying the resources required to provide sewerage and improved sanitation for Dhaka City	PDF	13	18,72,3
38		Interim Report 2 DFR WATER SUPPLY MASTER PLAN	to prepare the Water Supply Master Plan for Dhaka City	PDF		7,18,2,313
39		DHAKA METROPOLITAN DEVELOPMENT PLANING (DMDP)1995-2015 AREA INTEGRATED DETAILED Area PLAN FOR GROUP-C AREA 2010-2015 PART - III	MAP	PDF	4	18
40		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - III	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	Word	4	18,20,2,3,7
41		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - IV	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	PDF	4	18,20,2,3,7
42		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP)	a detailed analysis of the StrateGIS Planning Zone (SPZ) areas identified in the Structure Plan and Urban Area Plan	PDF	4	18,2;17,13,20
43		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - VI	The Detailed Area Plan provides guidance for development where action is expected in the short term and it covers individual parts of a city within a variable time frame.	PDF	4	18,3,20,7
44		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - VII	The main objective of Detailed Area Plan (DAP) is to implement the Structure Plan (SP) and Urban Area Plan (UAP) policies and recommendations providing a basic Urban Design of good quality functional aesthetic quality and flexibility	PDF	4	18,2,3,7
45		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - VIII	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	PDF	4	18,20,2,3'7
46		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - IX	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	PDF	4	18,20,2,3'7
47		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - X	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	PDF	4	18,20,2,3'7
48		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XI	a detailed analysis of the StrateGIS Planning Zone (SPZ) areas identified in the Structure Plan and Urban Area Plan	PDF	4	18,2;17,13,20
49		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XII	a detailed analysis of the StrateGIS Planning Zone (SPZ) areas identified in the Structure Plan and Urban Area Plan	PDF	4	18,2;17,13,20
50		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XIII	The Detailed Area Plan provides guidance for development where action is expected in the short term and it covers individual parts of a city within a variable time frame.	PDF	4	18,3,20,7

51	Density Zoning	DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XIV	The Detailed Area Plan provides guidance for development where action is expected in the short term and it covers individual parts of a city within a variable time frame.	PDF	4	18,3,20,7
52		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XV	The main objective of Detailed Area Plan (DAP) is to implement the Structure Plan (SP) and Urban Area Plan (UAP) policies and recommendations providing a basic Urban Design of good quality functional aesthetic quality and flexibility	PDF	4	18,2,3,7
53		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XVI	DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years (1995-2005) for the development of urban area within the RAJUK boundary	PDF	4	18,20,2,3'7
54		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XVII	The main objective of Detailed Area Plan (DAP) is to implement the Structure Plan (SP) and Urban Area Plan (UAP) policies and recommendations providing a basic Urban Design of good quality functional aesthetic quality and flexibility	PDF	4	18,2,3,7
55		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XVIII	a detailed analysis of the StrateGIS Planning Zone (SPZ) areas identified in the Structure Plan and Urban Area Plan	PDF	4	18,2;17,13,20
56		DHAKA METROPOLITAN DEVELOPMENT PLAN (DMDP)1995-2015 DETAILED AREA PLAN (DAP) PART - XIX	The main objective of Detailed Area Plan (DAP) is to implement the Structure Plan (SP) and Urban Area Plan (UAP) policies and recommendations providing a basic Urban Design of good quality functional aesthetic quality and flexibility	PDF	4	18,2,3,7
57		Sheltech Final DAP Report Density zoning Dhaka City	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035 , aiming to reduce pressure of population in the Dhaka core and make it livable	Word	_	18,1,8
58		Nov Density Guidelines	Analysis of Building Height according to Area Specific FAR for different urban areas in DMDP Area based on present planning context of Dhaka City	Word	_	20,6,18
59		Infrastructure Suitability Categorization of DAP Areas Based on GeoloGISal Survey of Bangladesh (GSB) Map	Infrastructure Suitability Categorization of DAP Areas Based on GeoloGISal Survey of Bangladesh (GSB) Map	Word	_	2,19
60		Nov DAP Density Guidelines rev	Analysis of Building Height according to Area Specific FAR for different urban areas in DMDP Area based on present planning context of Dhaka City	Word	_	20,6,18
61		Final_DAP Report_ Density zoning_Dhaka City	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035, aiming to reduce pressure of population in the Dhaka core and make it livable.	Word	_	18,1,8
62		Final_Density Zoning_Cover and Content	Contents of the Report	Word	4	18,1,8
63		DAP Report_ Density zoning_Dhaka City_03072018	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035, aiming to reduce pressure of population in the Dhaka core and make it livable	Word	_	18,1,8
64		Density Intensification Index	Density Intensification Index	Word	_	18,1,8,12,13,2
65		Density Planning for Dhaka City: (Detail Area Planning)	Density zoning is a tool to regulate the development intensity of any specific area	Power point	_	20,18,1,8
66		Density Policy Guidelines_Modified	Density Realities for Dhaka City	Word	_	18,1,8
67		Density_Interim Report	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035, aiming to reduce pressure of population in the Dhaka core and make it livable	Word	_	18,1,8
68		Draft_Density_Report	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035, aiming to reduce pressure of population in the Dhaka core and make it livable	Word	_	18,1,8
69		Primary_Density Planning_Interim Report	Density zoning' has been incorporated in the Detailed Area Plan (DAP), 2016-2035, aiming to reduce pressure of population in the Dhaka core and make it livable	Word	_	18,1,8
70		Recommended Guidelines for Density Zoning	Recommended Guidelines for Density Zoning	word	_	18,20,1,8,6
71		DMDP URBAN AREA PLAN, DAP and Other Reviews	DMDP Urban Area Plan, 1995-20055	Word		18,12,6,7,1,8,9,13

72	BBS	BBS Data BANGLADESH BUREAU OF STATISTICS (BBS)	Manikganj, Munshiganj,Narshindi Tables of Distributions	GIS & Exell		
73		BBS_dhaka BANGLADESH BUREAU OF STATISTICS (BBS)	Tables of Distributions	PDF & Exell		
74		ECONOMIC CENSUS 2013	Economic Census 2013, District Report: Dhaka The main objective of the Economic Census was to observe the nature of the structural changes taken place in the economy over the last decade, and to provide comprehensive statistical information	PDF	1,3,4	18,5
75		Dhaka_20at_20a_20glance_20General	Community Report Dhaka Zila Population and Housing Census 2011	PDF	2,3	20
76		economic_census_2013_dhaka_thana	Table of Total Establishment number & Total People engaged,...	Exell		
77		Gazipur_20at_20a_20glance	Community Report, Gazipur Zila, June 2012 Population and Housing Census 2011	PDF	2,3	20
78		Narayanganj_20at_20a_20glance	Community Report, Narayanganj Zila, June 2012 Population and Housing Census 2011	PDF	2,3	20
79		Pages-from-FinalReport-Part-2	Permanent Establishments and Total Person Engaged (TPE) by Major Economic Activity, and by District & Location, 2013	PDF		
80	Others	Full Thesis Seismic Microzonation	SEISMIC MICRO ZONATION OF DHAKA CITY BASED ON SITE AMPLIFICATION AND LIQUEFACTION To study soil amplification characteristics of different locations of Dhaka and To develop microzonation maps	PDF		1,8,18,19
81		Outliene_Geomorphology	Preparation of Detailed Area Plan (2016-2035) for RAJUK Area, Part-A	Word	4	19, 13

4- GEOTECHNICAL STDUIES

Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	For Geomorphologist	BTM_for_Jinnah	GIS	GIS		
2		GIS	GIS	GIS		
3		Chapter 3-1 - TOPOGRAPHIC SURVEY	This chapter contains the findings of topographic survey	WORD	4	19,18,7,13

5- SEISMIC HAZARD ANALYSIS OF DHAKA

Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1		Earthquake Risk Assessment	Comprehensive Disaster Management Programme. Risk Assessment of Dhaka, Chittagong and Sylhet City Corporation Area.	PDF	1,4	8,18,19,2,3,12,11,20,6
2		Seismic Hazard Assessment Dhk, Chg, Syl	SEISMIC HAZARD MAP FOR SEISMIC HAZARD AND VULNERABILITY ASSESSMENT OF DHAKA, CHITTAGONG AND SYLHET CITY CORPORATION AREA	PDF	1,4	8,18,2,3

6- VULNERABILITY AND RISK ANALYSIS OF DHAKA-DAMAGE AND LOSS ANALYSIS						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	CDMP P2	CP_Ward	Scenario-based Spatial Contingency Plan for Ward No. 01 of DNCC. to guide the ward-level stakeholders and decision makers to prepare for likely consequences and respond immediately in a coordinated and effective way in the aftermath of an emergency in the ward.	PDF	1,4	1,8,18,11,9
2	WB BUERPDNCC	Dhaka Profle and Earthquake Risk Atlas	to provide a scientifc and systematized presentation of the results and key fndings of the Bangladesh Urban Earthquake Resilience Project by compiling physical, demographic, and socio-economic data	PDF		18,1,8,2,3
3		Hazards, Vulnerability and Risk Assessment (HVRA) Guidebook	Te Guidebook summarizes the earthquake hazard, vulnerabilities and risk assessment (HVRA) studies relevant to Dhaka	PDF		18,1,8,2,3
4		Information, Education & Communication Action Plan	to support the Government of Bangladesh in its role as a technical resource for earthquake risk reduction and as the focal point for standard messages and materials on earthquake awareness and readiness in the country	PDF		2,3,18,1,8
5		Legal and Institutional Arrangements (LIA) Framework Guidebook	integrate urban disaster risk reduction (DRR) in key governance functions such as land use and urban development planning	PDF		18,1,8,2,3,720
6		Risk-Sensitive Land Use Plannning Guidebook	to better plan growth in terms of infrastructure and construction by taking into account hazard and risk parameters that can protect these investments from major damages.	PDF		18,1,8,2,3
7		Training and Capacity Building Action Plan	Training Needs Assessment was conducted with selected participants in the RSLUP Blended Training to determine their existing capacities	PDF		18,1,8,2,3
8		National urban health strategy	National Urban Health Strategy 2014. The strategy of primary health care, nutrition, and family planning service delivery is presented in ten definite actions	PDF	4	18,3,2

7- LAND USE MAPPING AND INTEGRATION OF RISK INFORMATION WITH THE PHYSICAL/STRUCTURAL PLAN OF RAJUK AREA						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	7th Five Year Plan	7FYP-Final-Draft_13_10_15	SEVENTH FIVE YEAR PLAN, FY2016 – FY2020 growth acceleration, employment generation and rapid poverty reduction	PDF	2,3,4	18,5,7,13
2		7FYP-Final-Draft_13_10_15_Neaz	SEVENTH FIVE YEAR PLAN, FY2016 – FY2020growth acceleration, employment generation and rapid poverty reduction	PDF	2,3,4	18,5,7,13
3	Urban Design	report DAP-20_10_2018	Bangal Language	Word	_	_
4		KALLAYANPUR	_	GIS		
5		PREPARATION OF DETAILED AREA PLAN (DAP) 2016-2035 FOR DMDP AREA	MAPS	PDF	4	18,3,6
6		MASTERPLAN	Maps	PDF	4	18,3,6
7	Economist	Dhanmondi	_	GIS	_	_
8		Map-1_Growth_Str	_	GIS	_	_
9		Land Price and Trends in Land Filling	Housing Structure in Dhaka and its Neighborhood	Word	_	20,18,6
10		Land Price and Trends in Land Filling_V1.1	Housing Structure in Dhaka and its Neighborhood	Word	_	20,18,6
11		Land Price and Trends in Land Filling_V1.2	Housing Structure in Dhaka and its Neighborhood	Word	_	20,18,6
12	DAP 2016-2035 Reports (Detailed Area Plan)	Final syrvey report of Preparation of detailed area plan (DAP)	to convey the client about field level survey findings and PRA conducted as per ToR and the procedure that have been adopted to perform the survey works and PRA.	PDF	5,20,4	1, 2,3,13,17
13		Final interim report of preparation of detailed area plan (2016-2035) for DMDP area	The purpose of the Interim report is to prepare the groundwork for plan making. The consultants perceive this groundwork to be a set of directions for decision making in the planning stage.	PDF	5,4,20	3
14		Outliene_Municipal Services_rev	Preparation of Detailed Area Plan, DAP (2016-2035) of RAJUK Area Sector:Municipal/ Utility Service	word	4	15,16,17,13,18,1,8,2,3
15		Outline_Land Use and Development Control	Preparation of Detailed Area Plan (2016-2035) for RAJUK Area, Part-A	word	4	13,18,1,8
16		Outline_Transport	OUTLINE OF WORKING PAPER ON TRANSPORT	word	_	13,12,2
17		Chapter 1 - INTRODUCTION	Surveying and mapping are the main activities of the assigned work of this report according to the systematic approach of the (TOR).	WORD	4	18,3,7
18		Chapter 2 - METHODOLOGY OF SURVEY ACTIVITIES	A detailed physical survey has been conducted through the entire study area of Location-10. As per ToR	WORD	4	7,2,3,18,19
19		Chapter 3-2	Long-section of Satarkul Road at Safaul Pre-cadet and High School Area	WORD	4	19
20		Chapter 3-3	Long-section of Begunbari Khal	WORD	4	19

21		Chapter 4-1 - PHYSICAL FEATURES SURVEY	This chapter contains the findings of physical features survey consisting of all structures	WORD	4	20,18,6,2,3
22		Chapter 4-2	Table of Union wise number of educational institute by level of education in the study area	WORD	4	_
23		Chapter 5	PHYSICAL INFRASTRUCTURE SURVEY	WORD	4	2,18,3,13,15, 17,16
24		Chapter 6-1 - LAND USE SURVEY	contains the findings of land use survey consisting of uses of land in different purposes like	WORD	4	18,3,2
25		Chapter 6-2	Table of Union wise land use statement by broad land use category	WORD	4	18,3,2
26		Chapter 7-1 - SOCIO-ECONOMIC SURVEY FINDINGS	This section reports the socio-economic status of people living in the area	WORD	4	18,3,2,13
27		Chapter 7-2	Table of Percentage distribution of study area population aged 6 years or above by monthly household income	WORD	4	_
28		Chapter 8-1	CONCLUSION	WORD	4	_
29		Chapter 8-2	Table of Key task and actual input of consultant expert involved in preparation of DAP, Group-E	WORD	4	_
30		Housing for Disadvantaged Group	Rapid population growth and so rapid urbanization during the last three decades has created extra pressure on housing in the Dhaka City	WORD	4	20,18
31		Chapter-1 Introduction	Implement Structure Plan and Urban Area Plan policies	Word	4	18,3
32		Chapter-1 Introduction	Implement Structure Plan and Urban Area Plan policies	Word	4	18,7,3
33		Map	Map	GIS	_	_
34		Chapter 1 Background	the detailed area plan proposals, the projects prepared based on the plan, priority and phasing of project	Word	4	7,18,20,3,2
35		Chapter 2 - Critical Planning Issues	critical planning issues and development problems of the planning area as ascertained during the course of the study	Word	4	7,18,20,3,2
36		Chapter 3 - Development Plan Proposal	development plan proposals	Word	4	7,18,20,3,2
37		Chapter 4 - Plan Implementation	implementation phasing and priorities of development proposals	Word	4	7,18,20,3,2
38		Chapter 5 - Project Plan	highlights the projects with preliminary cost estimates and design	Word	4	7,18,20,3,2
39		Chapter 6 - Follow Up Actions	In order to accomplish the goals set forward in the plan, some follow up actions are required	Word	4	7,18,20,3,2
40		Chapter 7	Conclusion	Word	4	7,18,20,3,2

41		Photos	Photos	GIS	_	_
42		Maps	Maps	JPG & GIS	_	_
43		Maps	Maps	GIS	_	_
44		Photos	Photos	GIS	_	_
45		Chapter 1 Background	describes background, purpose, objectives and format of Detailed Area Plan	Word	4	7,18,20,3,2
46		Chapter 2 - Critical Planning Issues	about analyzing the existing development pattern in the project area.	Word	4	7,18,20,3,2
47		Chapter 3 - Development Plan Proposal	describes zoning provisions and makes some comments on some critical issues of the Structure Plan	Word	4	7,18,20,3,2
48		Chapter 4 - Plan Implementation	measures have bee proposed for implementation of the plan	Word	4	7,18,20,3,2
49		Chapter 5 - Project Plan	highlights the projects with preliminary cost estimates and design	Word	4	7,18,20,3,2
50		Chapter 6 - Follow Up Actions	In order to accomplish the goals set forward in the plan, some follow up actions are required	Word	4	7,18,20,3,2
51		Chapter 7	Conclusion	Word	4	7,18,20,3,2
52		Chapter Name	Chapter Name	Word	_	_
53		Maps	Maps	GIS	_	_
54		Photos	Photos	GIS	_	_
55		Chapter 1 Background	describes the background, objectives, format of the plan, review of previous plans, duration and custodian of the plan and actions on public hearing results.	Word	4	7,18,20,3,2
56		Chapter 2 - Critical Planning Issues	analyzes the existing development pattern of the project area and identities critical issues	Word	4	7,18,20,3,2
57		Chapter 3 - Development Plan Proposal	describes the development proposals	Word	4	7,18,20,3,2
58		Chapter 4 - Plan Implementation	contains phasing and priorities of development proposals to be implemented	Word	4	7,18,20,3,2
59		Chapter 5 - Project Plan	highlights the projects in more details	Word	4	7,18,20,3,2
60		Chapter 6 - Follow Up Actions	In order to accomplish the goals set forward in the plan, some follow up actions are required	Word	4	7,18,20,3,2
61		Chapter 7	Conclusion	Word	4	7,18,20,3,2
62		Maps	Maps	GIS	_	_
63		Photos	Photos	GIS	_	_
64		Chapter 1 Background	describes the background, objectives, format of the plan, review of previous plans, duration and custodian of the plan and actions on public hearing results	Word	4	7,18,20,3,2
65		Chapter 2 - Critical Planning Issues	analyzes the existing development pattern of the project area	Word	4	7,18,20,3,2
66		Chapter 3 - Development Plan Proposal	describes the development plan proposals	Word	4	7,18,20,3,2
67		Chapter 4 - Plan Implementation	contains phasing and priorities of development proposals to be implemented	Word	4	7,18,20,3,2
68		Chapter 5 - Project Plan	highlights the projects in more details including design	Word	4	7,18,20,3,2
69		Chapter 6 - Follow Up Actions	In order to accomplish the goals set forward in the plan, some follow up actions are required	Word	4	7,18,20,3,2
70		Chapter 7	Conclusion	Word	4	7,18,20,3,2
71		Figure	Figure	GIS	_	_
72		Maps	Maps	GIS	_	_
73		Photos	Photos	GIS	_	_
74		Chapter 1 Background	The current report is the Final Plan Report	Word	4	7,18,20,3,2
75		Chapter 2 - Critical Planning Issues	analyzing the existing development pattern of the project area	Word	4	7,18,20,3,2
76		Chapter 3 - Development Plan Proposal	describes the development plan proposals made for Location-10 area	Word	4	7,18,20,3,2
77		Chapter 4 - Plan Implementation	contains phasing and priorities of development proposals to be implemented	Word	4	7,18,20,3,2
78		Chapter 5 - Project Plan	highlights the projects including design	Word	4	7,18,20,3,2
79		Chapter 6 - Follow Up Actions	accomplish the goals set forward in the plan, some follow up actions are required.	Word	4	7,18,20,3,2
80		Chapter 7	Conclusion	Word	4	7,18,20,3,2

81		GIS	GIS	GIS	_	_
82		Chapter 1 Introduction	describes purpose and format of Detailed Area Plan and provides basic statistics of the project area	Word	4	18,1,8,13,7,3,2
83		CHAPTER 2 Present Scenerio and Crical Issues	analyze the existing development pattern of the study area	Word	4	18,1,8,13,7,3,2
84		CHAPTER 3 Development Plan PROPOSALS	The DMDP Structure Plan and Urban Area Plan (1995-2015)	Word	4	18,1,8,13,7,3,2
85		Chapter 4 PLAN IMPLEMENTATION	It Report the consultant takes the approach to fix up priorities and phasing of DAP projects	Word	4	18,1,8,13,7,3,2
86		Chapter 5 Project Plan	It Report the consultant highlights the projects with preliminary cost estimates and design	Word	4	18,1,8,13,7,3,2
87		Chapter 6 Follow up Actions	concluding part of the draft report that illustrates the actions that are necessary to undertake in order to effectively execute the plan proposals	Word	4	18,1,8,13,7,3,2
88		EXECUTIVE SUMMARY Group-E Extension	Group-E Extension Area	Word	4	9,1,8,7,13
89		Landus Table_Extension	Table of Proposed Landuse of Extension of Group-E	Word		
90		Mouzapopulation extension	Table of Population	Word		
91		Submission Ltr	Submission of Report-IV (Draft Final Report) for Preparation of Detailed Area Plan (DAP) of Group-E Extension Area (Part of Group-D)	Word	4	
92		Chapter 1 Introduction	describes purpose, objectives and format of Detailed Area Plan Group-E Extension area	Word	4	18,2,37,1,8,9,13
93		CHAPTER 2 CRITICAL PLANNING ISSUES	analyzing the existing development pattern of the project area	Word	4	18,2,37,1,8,9,13
94		CHAPTER 3 DEVELOPMENT PLAN PROPOSALS	Final Plan report of Group-E Extension area describes the development plan proposals	Word	4	18,2,37,1,8,9,13
95		Chapter 4 PLAN IMPLEMENTATION	approach to fix up priorities and phasing of DAP projects	Word	4	18,2,37,1,8,9,13
96		Chapter 5 Project Plan	consultant highlights the projects with preliminary cost estimates and design	Word	4	18,2,37,1,8,9,13
97		Chapter 6 Follow up Actions	In order to accomplish the goals set forward in the plan, some follow up actions are required	Word	4	18,2,37,1,8,9,13
98		CHAPTER 7 Conclusion	CONCLUSION	Word	4	18,2,37,1,8,9,13
99		EXECUTIVE SUMMARY Group-E Extension	Group-E Extension Area	Word		
100		Tables	Tables	Word		

101		CPM	Activ Schedule E	GIS		
102		GIS	map	GIS		
103		Schedule	Schedule	Word		
104		Chapter-1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the future Dhaka city	Word	4	18,3,2,7
105		Chapter-2	APPROACH TO PLANNING AND METHODOLOGY	Word	4	18,3,2,7
106		Chapter-3	EDITING AND UPDATING	Word	4	18,3,2,7
107		Chapter-4	LAND SUITABILITY ANALYSIS BY NEIGHBORHOOD LEVEL	Word	4	18,3,2,7
108		Chapter-5	IDENTIFICATION OF MULTI-SECTORAL INVESTMENT PROJECTS	Word	4	18,3,2,7
109		Chapter-6	COMPREHENSIVE PLANNING	Word	4	18,3,2,7
110		Chapter-7	URBAN DESIGN AND PLANNING PROCEDURE	Word	4	18,3,2,7
111		Chapter-8	INSTITUTIONAL AND LEGAL FRAMEWORK	Word	4	18,3,2,7
112		Chapter-9	WORK PROGRAM AND MANNING SCHEDULE	Word	4	18,3,2,7
113		Chapter-10	COMMENTS ON TERMS OF REFERENCE	Word	4	18,3,2,7
114		Chapter-11	OUTPUT AND FORMATS	Word	4	18,3,2,7
115		Correction of Inception Report Group-D	Correction of Inception Report	Word		
116		TASK OF PROFESSIONAL	TABLE OF ACTIVITY OF PROFESSIONAL PERSONNEL AND THEIR RESPONSIBILIES LINKAGE	Word		
117		Chapter 1 Introduction	Detailed Area Plan for the extension area of Group E	Word	4	18,3,2
118		Chapter 2 Higher level frameworks	describes the frame work and guidelines in higher level plans prepared earlier which have relevance to the current study	Word	4	18,3,2
119		Chapter 3 COMMUNICATION PLAN	STAKEHOLDER CONSULTATION	Word	4	18,3,2
120		Chapter 4 Formulation of Planning Principals and Standards	Determination of land allocation for various land uses, development of infrastructure, provision of services and facilities cannot be provided arbitrarily	Word	4	18,3,2

121		Chapter 5 Integrated Planning	about integrated planning of the study area under the policy guidelines of DMDP Structure Plan and Urban Area Plan	Word	4	18,3,2
122		Chapter 6 Priorities and Phasing	It Report the consultant works out the approach to fix up the priorities and phasing of DAP projects	Word	4	18,3,2
123		Chapter 7 Conclusion	Conclusion	Word	4	18,3,2
124		Compliance List	Compliance of Comments and Suggestion made in the Technical Management Committee Meeting held on 16-03-2008	Word		
125		Stakeholder	Stakeholders' participation	Word		
126		Chapter 1 Introduction	The objective of the project was to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,2,3,7,6
127		Chapter 2	Study Area Demarcation	Word	4	18,2,3,7,6
128		Chapter 3	Establishment of Bench Mark/Control Point	Word	4	18,2,3,7,6
129		Chapter 4	Preparation of Base Map and Demarcation of Project Boundary	Word	4	18,2,3,7,6
130		Chapter 5	Conclusion	Word	4	18,2,3,7,6
131		Correction of Report 1	Correction of Inception Report	Word	4	18,2,3,7,6
132		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,2,3,7,6,19, 12
133		Chapter 2	METHODOLOGY OF SURVEY ACTIVITIES	Word	4	18,2,3,7,6,19, 12
134		Chapter 3-1	TOPOGRAPHIC SURVEY	Word	4	18,2,3,7,6,19, 12
135		Chapter 3-2	Figures Of Taranagar-Kalatia-Hazratpur Road	Word	4	18,2,3,7,6,19, 12
136		Chapter 4	PHYSICAL FEATURE SURVEY	Word	4	18,2,3,7,6,19, 12
137		Chapter 5	PHYSICAL INFRASTRUCTURE SURVEY	Word	4	18,2,3,7,6,19, 12
138		Chapter 6-1	LAND USE SURVEY	Word	4	18,2,3,7,6,19, 12
139		Chapter 6-2	Table Of Union wise land use statement by broad land use category	Word	4	18,2,3,7,6,19, 12
140		Chapter 7-1	SOCIO-ECONOMIC SURVEY FINDINGS	Word	4	18,2,3,7,6,19, 12

141		Chapter 7-2	Table Of Population distribution of Hazratpur union aged 6 years and above by level of education and by age group	Word	4	18,2,3,7,6,19, 12
142		Chapter 8-1	CONCLUSION	Word	4	18,2,3,7,6,19, 12
143		Chapter 8-2	Key task and actual input of consultant expert involved in preparation of DAP, Extension of Group-E	Word	4	18,2,3,7,6,19, 12
144		Questionnaire D	Bangal Language	Word		
145		Case Study 1 Transportation Network	Transportation network comprising road, rail and water	Word		2,3,12,18,13, 1,8,6
146		Case Study 2 Flooding	FLOODING	Word		9,1,8,7,13
147		Case Study 3 Remitance and infrastructure development	TRAFFIC CONGESTION	Word		18,12,2,3,6
148		Tables	Flood and Transport Tables	Word		
149		Introduction	The problems that are mentioned in the ToR	Word		18,20,7,13,12 ,2,3
150		CHAPTER 1 BACKGROUND	illustrates the detailed area plan proposals, the projects devised based on the plan, priority and phasing of project implementation and other details of institutional issues	Word	4	18,2,3,7,7,13, 1,8
151		CHAPTER 2	Critica Planning Issues	Word	4	18,2,3,7,7,13, 1,8
152		CHAPTER 3	Development Plan Proposal	Word	4	18,2,3,7,7,13, 1,8
153		Chapter 4 Plan Implementation new	Plan Implementation	Word	4	18,2,3,7,7,13, 1,8
154		Chapter 5	Project Plan	Word	4	18,2,3,7,7,13, 1,8
155		Chapter 6	Follow Up Actions	Word	4	18,2,3,7,7,13, 1,8
156		Table of Contents	Report-IV (Draft Plan Report) Preparation of Detailed Area Plan for Group-E of DMDP	Word		
157		Tables	Tables	Word		
158		Chapter 1 Bacground	Final Plan Report that illustrates the detailed area plan proposals, the projects prepared based on the plan, priority and phasing of project implementation and other details of institutional issues	Word	4	18,2,3,7,6
159		Chapter 2	CRITICAL PLANNING ISSUES	Word	4	18,2,3,7,6
160		Chapter 3	DEVELOPMENT PLAN PROPOSAL	Word	4	18,2,3,7,6
161		Chapter 4 Plan Implementation new	PLAN IMPLEMENTATION	Word	4	18,2,3,7,6
162		Chapter 5	PROJECT PLAN	Word	4	18,2,3,7,6
163		Chapter 6	FOLLOW UP ACTIONS	Word	4	18,2,3,7,6
164		CHAPTER 7	CONCLUSION	Word	4	18,2,3,7,6
165		Executive	EXECUTIVE SUMMARY of Detailed Area Plan (DAP)	Word	4	18,2,3,7,6
166		Submission Ltr	CONCLUSION	Word		
167		CPM	CPM	GIS		
168		Schedule	Schedule	Word		
169		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,2,3,6,7
170		Chapter 2	APPROACH TO PLANNING AND METHODOLOGY	Word	4	18,2,3,6,7
171		Chapter 3	EDITING AND UPDATING	Word	4	18,2,3,6,7
172		Chapter 4	LAND SUITABILITY ANALYSIS BY NEIGHBORHOOD LEVEL	Word	4	18,2,3,6,7
173		Chapter 5	IDENTIFICATION OF MULTI-SECTORAL INVESTMENT PROJECTS	Word	4	18,2,3,6,7
174		Chapter 6	COMPREHENSIVE PLANNING	Word	4	18,2,3,6,7
175		Chapter 7	URBAN DESIGN AND PLANNING PROCEDURE	Word	4	18,2,3,6,7
176		Chapter 8	INSTITUTIONAL AND LEGAL FRAMEWORK	Word	4	18,2,3,6,7
177		Chapter 9	WORK PROGRAM AND MANNING SCHEDULE	Word	4	18,2,3,6,7
178		Chapter 10	COMMENTS ON TERMS OF REFERENCE	Word	4	18,2,3,6,7
179		Chapter 11	OUTPUT AND FORMATS	Word	4	18,2,3,6,7
180		List of CS & RS Mouza Maps & Collection Status	LIST OF CS MOUZA MAPS AVAILABLE (COLLECTED) IN ORIGINAL Detailed Area Plan (DAP), Group-E Project	Word		

181		TASK OF PROFESSIONAL	ACTIVITY OF PROFESSIONAL PERSONNEL AND THEIR RESPONSIBILIES LINKAGE	Word		
182		Map	Map	GIS		
183		Social Facility	Social Facility	Exells		
184		Chapter 1 Introduction	It describes about the development strategies and proposals of previous higher level plans and their relation with the current DAP project	Word	4	18,2,3,6
185		Chapter 2	HIGHER LEVEL FRAMEWORKS	Word	4	18,2,3,6
186		Chapter 3	COMMUNICATION PLAN: CONSULTATIONS	Word	4	18,2,3,6
187		Chapter 4	FORMULATION OF PLANNING PRINCIPLES AND STANDARDS	Word	4	18,2,3,6
188		Chapte 5	Integrated Plan revised	Word	4	18,2,3,6
189		Chapter 6	Third consultation and Plan Preparation revised	Word	4	18,2,3,6
190		Chapter 7	Priorities and Phasing UPDATE	Word	4	18,2,3,6
191		Chapter 8	CONCLUSION	Word	4	18,2,3,6
192		Consul Commen TMC	Comments of RAJUK (Only relevant ones)	Word	4	
193		density	Density forecast for Group E area	Word		3,18,13
194		Pop Mauza Projection 2015	Table of population	Exell		3,18,13
195		Chapter 1 Introduction	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,2,3,6,7
196		Chapter 2	Study Area Demarcation	Word	4	18,2,3,6,7
197		Chapter 3	Preparation and Compilation of Base Map	Word	4	18,2,3,6,7
198		Chapter 4	Conclusion	Word	4	18,2,3,6,7
199		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,2,3,6,7,19, 12
200		Chapter 2	METHODOLOGY OF SURVEY ACTIVITIES	Word	4	18,2,3,6,7,19, 12

201		Chapter 3-1	TOPOGRAPHIC SURVEY	Word	4	18,2,3,6,7,19, 12
202		Chapter 3-2	Cross-section and Long-section of Dhaka-Aricha Highway at Amin Bazar Area	Word	4	18,2,3,6,7,19, 12
203		Chapter 4-1	PHYSICAL FEATURES SURVEY	Word	4	18,2,3,6,7,19, 12
204		Chapter 4-2	Table Of Union wise number of educational institute by level of education in the study area	Word	4	18,2,3,6,7,19, 12
205		Chapter 5	PHYSICAL INFRASTRUCTURE SURVEY	Word	4	18,2,3,6,7,19, 12
206		Chapter 6-1	LAND USE SURVEY	Word	4	18,2,3,6,7,19, 12
207		Chapter 6-2	Table Of Union wise land use statement by broad categories in the study area	Word	4	18,2,3,6,7,19, 12
208		Chapter 7-1	SOCIO-ECONOMIC SURVEY FINDINGS	Word	4	18,2,3,6,7,19, 12
209		Chapter 7-2	Table Of Percent distribution of study area population	Word	4	18,2,3,6,7,19, 12
210		Chapter 8-1	CONCLUSION	Word	4	18,2,3,6,7,19, 12
211		Chapter 8-2	Key task and actual input of consultant expert involved in preparation of DAP, Group-E	Word	4	18,2,3,6,7,19, 12
212		Cover Part-1	Development Plan (DMDP) Area GROUP-E ,REPORT-II (Survey Report) ,Part-I (Survey Findings)	Word		
213		Facts Sheets	Facts and Finding Sheet Case studies	Word		
214		Case study 1	Housing for disadvantage group	Word		18,20,6
215		Case study 2	Informal Economic Activities	Word		3
216		Case study 3	TRAFFIC CONGESTION	Word		12,2,18
217		Case study 4	DRAINAGE	Word		7,13,7,9
218		Case study 5 Water logging	WATER LOGGING	Word		13,7,18,2,3,9
219		Case study 6	UNAUTHORIZED ENCROACHMENT	Word		18,2,3,20
220		Case study 7	WASTE DISPOSAL	Word		7,3,13

221		Case study 8	PARKS AND PLAYGORUNDS	Word		7,18,3
222		Case study 9	STAKEHOLDERS' PARTICIPATION	Word		
223		Cover Part 2	Preparation of Detailed Area Plan for Dhaka Metropolitan Development Plan (DMDP) Area GROUP-E REPORT-II (Survey Report)	Word	4,20,5	
224		Introduction	The problems that are mentioned in the ToR for case studies	Word		
225		Table of Content	Preparation of Detailed Area Plan for DMDP, Group-E	Word		
226		Traffic volume at savar	Table Of Hourly traffic count at Savar Bazaar Bus stand point	Word		
227		Waste disposal flowchart	Figure Of Flow chart of Solid Waste Management System of Savar Pourashava	Word		
228		GIS	map layout format	GIS		
229		Schedule	Schedule	Exell		
230		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the future Dhaka city	Word	4	18,3,7,9,13,12,2,1,8
231		Chapter 2	APPROACH TO PLANNING AND METHODOLOGY	Word	4	18,3,7,9,13,12,2,1,8
232		Chapter 3	EDITING AND UPDATING	Word	4	18,3,7,9,13,12,2,1,8
233		Chapter 4	LAND SUITABILITY ANALYSIS BY NEIGHBORHOOD LEVEL	Word	4	18,3,7,9,13,12,2,1,8
234		Chapter 5	IDENTIFICATION OF MULTI-SECTORAL INVESTMENT PROJECTS	Word	4	18,3,7,9,13,12,2,1,8
235		Chapter 6	COMPREHENSIVE PLANNING	Word	4	18,3,7,9,13,12,2,1,8
236		Chapter 7	URBAN DESIGN AND PLANNING PROCEDURE	Word	4	18,3,7,9,13,12,2,1,8
237		Chapter 8	INSTITUTIONAL AND LEGAL FRAMEWORK	Word	4	18,3,7,9,13,12,2,1,8
238		Chapter 9	WORK PROGRAM AND MANNING SCHEDULE	Word	4	18,3,7,9,13,12,2,1,8
239		Chapter 10	COMMENTS ON TERMS OF REFERENCE	Word	4	18,3,7,9,13,12,2,1,8
240		Chapter 11	OUTPUT AND FORMATS	Word	4	18,3,7,9,13,12,2,1,8

241		Correction of Inception Report Location-10	Correction of Inception Report	Word		
242		CPM	mpp	GIS		
243		List of CS & RS Mouza Maps Collected and not Available	Status of CS Mauza Maps/Sheets	Word		
244		TASK OF PROFESSIONAL	ACTIVITY OF PROFESSIONAL PERSONNEL AND THEIR RESPONSIBILIES LINKAGE	Word		
245		Tables	Tables	Word		
246		Chapter 1 Introduction	contains development strategies and proposals of previous higher-level plans and their relation with the current DAP project	Word	4	18,3,6
247		Chapter 2	HIGHER LEVEL FRAMEWORKS	Word	4	18,3,6
248		Chapter 3	COMMUNICATION PLAN: STAKEHOLDER CONSULTATION	Word	4	18,3,6
249		Chapter 4	FORMULATION OF PLANNING PRINCIPLES AND STANDARDS	Word	4	18,3,6
250		Chapter 5	INTEGRATED PLANNING	Word	4	18,3,6
251		Chapter 6	PRIORITIES AND PHASING	Word	4	18,3,6
252		Chapter 1 Introduction	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,3,7,6
253		Chapter 2	Study Area Demarcation	Word	4	18,3,7,6
254		Chapter 3	Establishment of Bench Mark/Control Points	Word	4	18,3,7,6
255		Chapter 4	Preparation of Base Map and Demarcation of Project Boundary	Word	4	18,3,7,6
256		Chapter 5	Conclusion	Word	4	18,3,7,6
257		Correction of Report 1	Correction of Inception Report	Word	4	18,3,7,6
258		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,3,7,6,19,2,12
259		Chapter 2	METHODOLOGY OF SURVEY ACTIVITIES	Word	4	18,3,7,6,19,2,12
260		Chapter 3-1	TOPOGRAPHIC SURVEY	Word	4	18,3,7,6,19,2,12

261		Chapter 3-2	section of Satarkul Road at Safaul Pre-cadet and High School Area	Word	4	18,3,7,6,19,2,12
262		Chapter 3-3	Long-section of Begunbari Khal	Word	4	18,3,7,6,19,2,12
263		Chapter 4-1	PHYSICAL FEATURES SURVEY	Word	4	18,3,7,6,19,2,12
264		Chapter 4-2	Table Of Union wise number of educationa l institute by level of education in the study area	Word	4	18,3,7,6,19,2,12
265		Chapter 5	PHYSICAL INFRASTRUCTURE SURVEY	Word	4	18,3,7,6,19,2,12
266		Chapter 6-1	LAND USE SURVEY	Word	4	18,3,7,6,19,2,12
267		Chapter 6-2	Table Of Union wise land use statement by broad land use category	Word	4	18,3,7,6,19,2,12
268		Chapter 7-1	SOCIO-ECONOMIC SURVEY FINDINGS	Word	4	18,3,7,6,19,2,12
269		Chapter 7-2	Table Of Percentage distribution of study area population aged 6 years or above by monthly household income	Word	4	18,3,7,6,19,2,12
270		Chapter 8-1	CONCLUSION	Word	4	18,3,7,6,19,2,12
271		Chapter 8-2	Key task and actual input of consultant expert involved in preparation of DAP, Group-E	Word	4	18,3,7,6,19,2,12
272		Formates	Formates	Word		
273		Case study 1	Housing for disadvantage group	Word		18,20,6
274		Case study 2	Drainage, Water logging and Waste Disposal	Word		7,13,18
275		Introduction	The problems that are mentioned in the ToR for case studies	Word		
276		Waste disposal flowchart	Flow chart of Solid Waste Management System of Savar Pourashava	Word		
277		Chapter 1 INTRODUCTION	to prepare integrated development plans and priority sectoral plans for the Metropolitan Areas of Dhaka	Word	4	18,3,7,6,19,2,12
278		Chapter 2	METHODOLOGY OF SURVEY ACTIVITIES	Word	4	18,3,7,6,19,2,12
279		Chapter 3-1	TOPOGRAPHIC SURVEY	Word	4	18,3,7,6,19,2,12
280		Chapter 3-2	Cross-section and Long-section of Dhaka-Aricha Highway at Amin Bazar Area	Word	4	18,3,7,6,19,2,12

281		Chapter 4-1	PHYSICAL FEATURES SURVEY	Word	4	18,3,7,6,19,2,12
282		Chapter 4-2	Union wise number of educational institute by level of education in the study area	Word	4	18,3,7,6,19,2,12
283		Chapter 5	PHYSICAL INFRASTRUCTURE SURVEY	Word	4	18,3,7,6,19,2,12
284		Chapter 6-1	LAND USE SURVEY	Word	4	18,3,7,6,19,2,12
285		Chapter 6-2	Union wise land use statement by broad categories in the study area	Word	4	18,3,7,6,19,2,12
286		Chapter 7-1	SOCIO-ECONOMIC SURVEY FINDINGS	Word	4	18,3,7,6,19,2,12
287		Chapter 7-2	Percent distribution of study area population	Word	4	18,3,7,6,19,2,12
288		Chapter 8-1	CONCLUSION	Word	4	18,3,7,6,19,2,12
289		Chapter 8-2	Key task and actual input of consultant expert involved in preparation of DAP, Group-E	Word	4	18,3,7,6,19,2,12
290		Cover Part 1	Development Plan (DMDP) Area GROUP-E, REPORT-II (Survey Report), Part-I (Survey Findings)	Word		
291		Data Collection Format	Format	Word		
292		Facts Sheets	Case Study	Word		
293		Case study 1	HOUSING FOR DISADVANTAGED GROUP	Word		18,20,6
294		Case study 2	Informal Economic Activities	Word		3
295		Case study 3	Traffic congestion	Word		12,2,18
296		Case study 4	Drainage	Word		7,13,7,9
297		Case study 5	Water logging	Word		13,7,18,2,3,9
298		Case study 6	Unauthorized encroachment	Word		18,2,3,20
299		Case study 7	Waste disposal	Word		7,3,13
300		Case study 8	Parks and Playgrounds	Word		7,18,3

301		Case study 9	Stakeholders participation	Word		
302		Cover Part 2	Preparation of Detailed Area Plan for Dhaka Metropolitan Development Plan (DMDP) Area GROUP-E, REPORT-II (Survey Report)	Word	4,20,5	
303		Introduction	The problems that are mentioned in the ToR for case studies	Word		
304		Table of Content	Preparation of Detailed Area Plan for DMDP, Group-E	Word		
305		Traffic volume at savar	Traffic Flow Direction: South to North: Dhaka to Aricha/Paturia/Chandra/Ashulia/ local destinations	Word		
306		Social Development DHUTS	Social Environment	Word		7,12,18
307	DHAKA METROPOLITAN DEVELOPMENT PLAN	Chapter 1 INTRODUCTION , Dhaka Nlctropolitan DevelopnrentPlan Vol-l: Dhaka StructurePlan (1995-201	Preparationof StructurePlan, Master Plan, and Detailed Area Plan - Metropolitan Developmentand Plan Preparationand Managementin Dhaka and Chittagon	PDF	4	18,1,8,9,7,12
308		Chapter 2	EXISTINGSTRUCTUR	PDF	4	18,1,8,9,7,12
309		Chapter 3	FEATURESOF THE SPATIAL DEVELOPMENTSTRATEG	PDF	4	18,1,8,9,7,12
310		Chapter 4	SUB.AREASOFTHE STRUCTUREPLAN	PDF	4	18,1,8,9,7,12
311		Chapter 5	SECTORALPLANS,POLICIESAND PROPOSAL	PDF	4	18,1,8,9,7,12
312		Chapter 6	About Chapter 2	PDF	4	18,1,8,9,7,12
313		COVER	STRUCTUREPLAN, MASTER PLAN AND DETAILED AREA PLAN FORDHAKA CITY	PDF	4	
314		DHAKA METROPOLITAN DEVELOPMENT PLAN	Complete chapters	PDF		
315		TOC	TOC	PDF		
316	BNBC Draft	5 Bnbc-pt9-ch3 (Conservation)	Conservation of places, buildings, objects and manifestation of cultural	Word		18,7,2,3
317		National Land Policy(English)	Draft National land use policy 2016 to Improve the land management and administration system	PDF		18,7,3
318		National_Urban_Sector_Policy_2011_Bangladesh_(Draft)(1)	National Urban Sector Policy, 20011. ensure regionally balanced urbanization through decentralized development and hierarchically structured urban system	PDF	4	18,3,5,7,13
319		TOD-Delhi-2021	Transit Oriented Development GUIDELINES AND DEVELOPMENT CONTROL NORMS FOR MRTS* INFLUENCE ZONE FOR TRANSIT ORIENTED DEVELOPMENT	PDF		12,18,6,2,3
320		town_improvement_act_1953	THE TOWN IMPROVEMENT ACT, 1953. An Act to provide for the development, improvement and expansion	PDF		18,2,3,6
321		UrbanAndRegionalPlanningAct2015	THE URBAN AND REGIONAL PLANNING ACT, 2015. The Urban and Regional Planning	PDF		18,2,3

8- Transport						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1	DTCA	BRT	Bus Rapid Transit GuidePart & Report	PDF		18,12,7,2,3
2		BRT_Report	Bus Rapid Transit GuidePart & Report	PDF		18,12,7,2,3
3		Bus Net	Dhaka Bus Network and Regulatory riform Implementation, Final Workshop Presentation Dhaka Bus Network and Regulatory Reform Implementation Project	PDF		18,12,7,2,3
4		Bus Rapid transit	Bus Rapid Transit GuidePart & Report	PDF		
5		MRT_Depot	Photo & GIS	Photo & GIS		
6		RSTP	Photo & GIS	Photo & GIS		
7		RSTP (2016-2035) Final Report	StrateGIS Transport Plan for Dhaka 2015-2035 Table of Contents	PDF	4,12	7,2,3,18
8		STP-Final Report June 2005	The report of this component of the StrateGIS Transport Plan (STP) contains a description of the main activities leading up to the selection of the long term strateGIS plan for the greater Dhaka area	Vord & Photo	4,12	7,2,3,18
9		Status of Metro Routes	Current Status of all Metro Rail Lines	Word		
10	DHUTS (Dhaka urban Transport Study)	Draft Dhaka Structure Plan Report (Full Volume)	Making Dhaka A Livable, Functional & Resilient Metropolis Respecting Local Socio-Cultural Fabric & Environmental Sustainability	PDF		18,1,8,2,3,7
11		Final Inception Report of Regional Development Planning (RDP)	to facilitate a sustainable regional development planning process through better urban planning, demand-driven development and capacity building of the agencies involved in this sector	PDF	4	18,2,3,1,8,7
12		Final Survey Report of REGIONAL DEVELOPMENT PLANNING (RDP)	to present the existing the conditions of the RDP area based on analysis of data collected from the field and secondary sources including studies and reports	PDF	4, 20	18,1,8,2,3
13		INTERIM REPORT REGIONAL DEVELOPMENT PLANNING MOM (INTERIM REPORT)	to present the critical review of previous plans, programs, findings of consultation meeting with different stakeholders, addressing critical issues of RDP area, institutional setting, providing draft sectoral policies of Structure Plan for 2016-2035 of the RDP area	PDF	4,20	

14	Transport	outline for pedestrian path planning and design	increasing Currently modal share of pedestrian trip for Dhaka	Word	_	18,6,3,12,7,2
15		Road busdeport & Road class RSTP	maps	PDF	_	
16		DAP WRITEUP FOR TRANSPORT SECTION IN FINAL REPORT	The StrateGIS Transport Plan	Word	4	12,18,2,3,7
17		DETAIL AREA PLAN OUTLINE OF WORK PLAN FOR TRANSPORT	This report focused on providing facilities which will benefit maximum number of people	Word	_	18,12,7,18
18		OUTLINE FOR GUIDELINE FOR CYCLE TRACK	A cycle track is an exclusive bicycle facility that provides comfort to users with the on-street infrastructure of a conventional bike lane	Word	_	12,18,7,20
19		outline for footpath design	urban policy makers refocus their attention for pedestrians for which a footpath design guideline will be useful	Word	_	18,12,7,
20		outline for pedestrian path planning and design	increasing Currently modal share of pedestrian trip for Dhaka	Word	_	18,6,3,12,7,2
21		outline of hawker policy	To reduce illegal and on-street licensed hawking activities in streets	Word	_	18,3,12
22		OUTLINE OF INTERCITY BUSDEPOT STUDY	a feasibility study for selecting the locations of the bus depots	Word	_	4,12,7,18
23		OUTLINE OF TRANIT OR IENTED DEVELOPMENT POLICY	to maximize benefit to the commuters, and provide opportunity for the transit operator to recover some of the cost of the infrastructure through land value capture	Word	4	12,2,7,18
24		OUTLINE OF TRANIT OR IENTED DEVELOPMENT POLICY_rev	to maximize benefit to the commuters, and provide opportunity for the transit operator to recover some of the cost of the infrastructure through land value capture	Word	4	12,2,7,18
25		PARKING MANAGEMENT FOR DHAKA CITY_27062018	A vibrant city center must manage its parking well since it serves as key instrument to promote productivity and economy of the city.	Word	_	18,12,7,20
26		Review of Dhaka-Mawa Rail Link Project	The Project (Dhaka-Bhanga-Jessore Rail Link) covers nine districts lying within the two administrative divisions of Dhaka and Khulna	Word	_	18,12,2,7
27		REVIEW OF REVISED STRATEGIS TRANSPORT PLAN IN THE CONTEXT OF DAP	To put more emphasis in the integration of different Mass Transit system and To prepare short term and medium term implementation program of transport infrastructure	Word	4	18,12,3,2,7
28		MASS TRANSIT INITIATIVE FOR DHAKA	The government has taken initiative to construct some MRT and BRT but not much progress	Word	4	18,7,2
29	DHUTS (DHAKA URBAN TRANSPORT	PREPARATORY SURVEY REPORT ON DHAKA URBAN TRANSPORT NETWORK DEVELOPMENT STUDY (DHUTS) IN BANGLADESH	improvement of urban public transportation system for Dhaka Metropolitan Area (DMA)	PDF	4,12, (JICA)	18,2,6
30		PREPARATORY SURVEY REPORT ON DHAKA URBAN TRANSPORT NETWORK DEVELOPMENT STUDY (DHUTS) IN BANGLADESH	EXECUTIVE SUMMARY	PDF	4,12, (JICA)	18,2,6
31		DHUTS Review	Dhaka Urban Transport Network Development Study (DHUTS, 2010)	Word	4,12, (JICA)	18,2,6
32	Railway	Copy of Dhk to Jsr Rly Map.gdb	GIS	GIS		
33		Dhaka Mawa	GIS	GIS		
34		GIS	GIS	GIS		
35	Sixth Five Year Plan	Sixth Five Year Plan 2011-2016	SIXTH FIVE YEAR PLAN, FY2011-FY2015 Accelerating Growth and Reducing Poverty Part1, StrateGIS Directions and Policy Framework	PDF	4,2,3	18,2,3,13,7
36		SFYP-Final-Part-2-17-08-11	SIXTH FIVE YEAR PLAN, FY2011-FY2015 Accelerating Growth and Reducing Poverty Part-2, Sectoral Strategies, Programs and Polices	PDF	4,2,3	18,2,3,13,7
37	SRPG Report	SRPG_DFR	Strengthening Regional Planning and Governance (SRPG) streamline and strengthen the institutional frameworks of regional planning and governance	PDF	4	18,2,3,7,1,8

9- Energy						
Num	Group	Name	Subject	Type	Refer to stakeholder	Relate to stakeholder
1		Recommendations for Green Building Bangladesh ver 7	RECOMMENDATIONS FOR GREEN BUILDING CODE IN BNBC For BANGLADESH. to assist the Government of Bangladesh to amend the current Building Code with the purpose of developing mandatory standards to accelerate the development of Green Buildings in Dhaka	PDF		18,7,17,16,15,3,6
2		6 BNBC_Part3_Ch4_Sustainability	ENERGY EFFICIENCY AND SUSTAINABILITY	Word		18,6,7,3
4	Titas	Gas	GIS	GIS		

4.3.3 Project Organization

The Project in question is characterized by the need to punctually determine the overall needs of the Customer so that they can be provided with the project documentation drafted by the Consulting Team

- Organization of stakeholders to form a Project Working Group (PWG) and a Project Oversight Committee (POC).
- Organize kick-off meeting to a) Creating a cadre of professionals/scientific experts to oversee all the activities will be conducted, b) endorse the framework and implementation methodology prepared by the Consultancy Firm (The methodology and implementation framework should include i) data collection processes,ii) situation analysis, iii)past studies, iv) Needs analysis…etc)
- Develop and reach agreement on understanding of scope and deliverables, overall approach, work plan, timeline, milestones and team composition with RAJUK PIU and POC.

The activities under this task refers to Annexure C & D.

4.3.4 Planning Knowledge Base

As the consultant of DAP, Sheltech already has all relevant data related to urban planning of the city along with recent satellite image and the most updated GIS data. We're ready to prepare a planning knowledge base and share with the relevant experts, policy makers, civil society and stakeholders. The process of this task are followed as:

- Collection and review of relevant past studies including CDMP and B-URP[1] and other documentation relevant to hazard, vulnerability and risk assessment, remote-sensing imagery, land use planning, land use management, development and disaster risk management.
- Review, organize, annotate and catalog the collected “exposure” data a “Planning Knowledge Base". Determine and document potential gaps in data.
- Update demographic and socio-economic data characteristics and incorporate into the Planning Knowledge Base.
- Comprehensive "mapping" of all ongoing initiatives in the risk sensitive urban planning and governance sector;
- Identification of key interlocutors at the central level, city levels
- Assess technical and administrative capacity of government institutions involved in land policy and administration to carry out their function, including assessment of their training and institutional development needs
- Co-ordinate closely with relevant agencies working on land issues, in strengthening land registration and dispute settlement in urban areas.
- Design and carry out a consultative process involving urban settlements and other key stakeholders to identify problems, constraints and effective localized approaches to and urbanization
- Review national goals and strategies for urban governance especially in light of the national plan, providing general data and information of urbanization (i.e. Population and urban population, number of cities, etc.
- Assess the overall enabling environment within which urban governance must take place (political commitment, reform required of public administration systems etc)
- Undertake targeted field visits and ground truthing to develop an understanding of the development of Dhaka and to observe and document urban patterns of development, physical and environmental conditions, conflicts in land uses, zoning violations, and other relevant planning information. Include such observations and findings in the Planning Knowledge Base.
- Select relevant data layers on planning to recommend for integration into the GEODASH[2] platform.
- Integrate of the exposure data layers of the Planning Knowledge Base into a GIS system to enable the spatial analysis of data for Dhaka
- Undertake validation workshops with PWG to confirm the validity of data. These workshops should also be opportunities for sharing of knowledge and capacity building thru the training on the Planning Knowledge Base
- Present and validate with the RAJUK PIU-PIC and the POC.

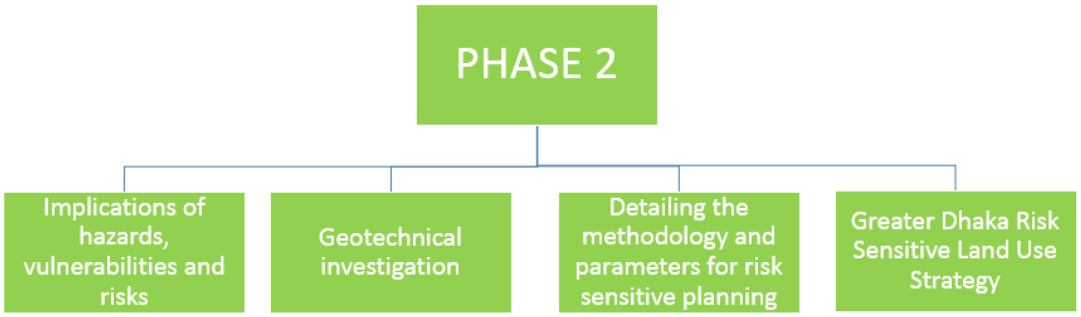
[1] Include Data Profile and Earthquake Risk Atlas, Bangladesh Urban Earthquake Resilience Project. World Bank, February 2014.
[2] The GIS databases for the built environment should be prepared in the format ready for upload into the GEODASH knowledge sharing platform.

4.3.5 Situational Analysis

Sheltech will conduct the situational analysis and diagnosis of current planning and development context. As it is already involved in planning of the City, it will be easier for the firm to conduct this study.

- Review and document the current planning system, its legislative foundation, process, approach, practice, evolution, implementation, enforcement and outputs;
- Review and document approach and content of the current town-plans and specific plans (regional and detailed);
- Assess gaps in planning process and identify potential shortcomings and conflicts in plan development and implementation;
- Collection and Updating of Resource Maps. These include maps representing geologic hazards, climate and metrological hazards, soil and geotechnical, natural drainage, elevation, and other.
- Validate assessment with PWG and RAJUK PIU-PIC
- Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.

4.4. Stage 2:



Developing this guideline should be in close contact with RAJUK and national Authorities including Communities. In that sense prior implementing this phase a comprehensive training and sensitizing workshop series should take place.

The activities should be carried out are as following;

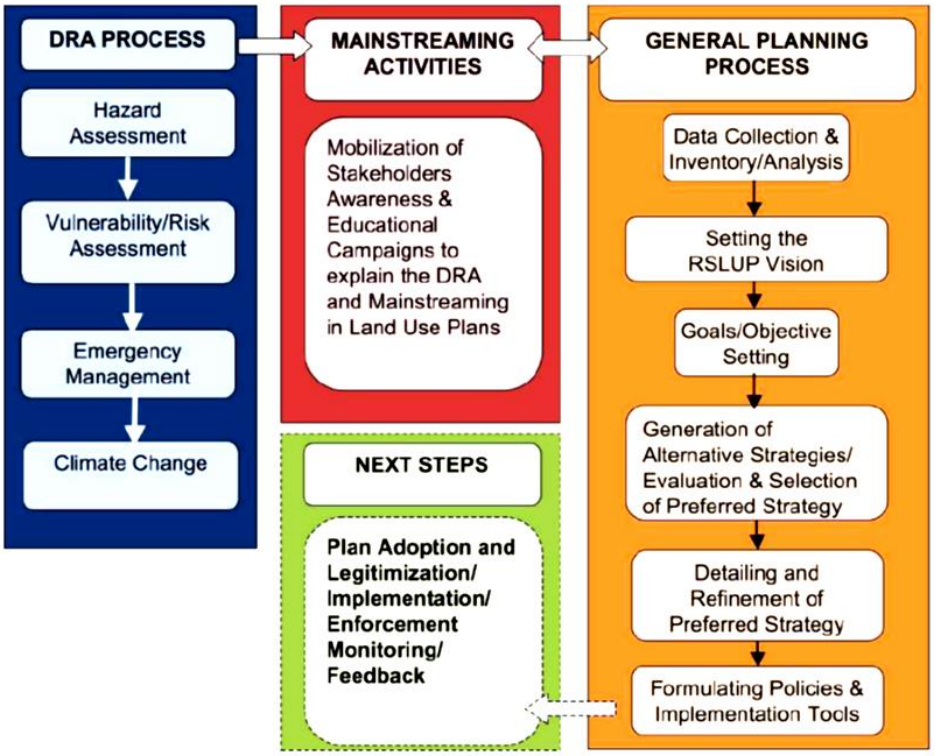
- Coordinate with Component B1 of the Bangladesh Urban Resilience Project to project the latest findings on risk profiles to Dhaka and to highlight the use of quantities such as Urban Resilience Indicators for Dhaka and Hotspots information indicating ward and other relevant geo-administrative units

- Conduct a comprehensive study to assess implications of hazards, vulnerabilities and risks on the current regional boundary[3]. In particular assess how hazards, vulnerabilities and risks were considered in the following contexts:
  - The nature, scale and location of major proposed land uses including new city development, residential and industrial areas and strategic community, recreation and commercial uses;
  - The strategic transport policies and proposals;
  - The policies for flood control and drainage;
  - The policies for seismic risk reduction and vulnerability reduction
  - The policies for resilient and livable towns
  - The policies for energy conservation and green efficiency
  - The policies for Solid waste management
  - The policies for urban mobility
  - Policies for preservation of Natural Water bodies and Waterfront;
  - Policies for water supply;
  - Policies for sustainable environment;
  - Policies for disaster management;
  - Policies for historical and cultural preservation and enhancement;
  - The strategic proposals for utilities;
  - The nature, scale and location of land areas to be conserved;
  - The policies and proposals for revitalization, upgrading and environmental management in obsolescent urban areas;
  - The policies and proposals for regeneration and rehabilitation of old fabrics including slums upgrading and city extensions
  - The policies and proposals for Historical heritage conservation
  - The strategies and policies for development control;
  - The approach to density zoning (Area wise) and height zoning (Area wise)

4.4.1 Framework Development

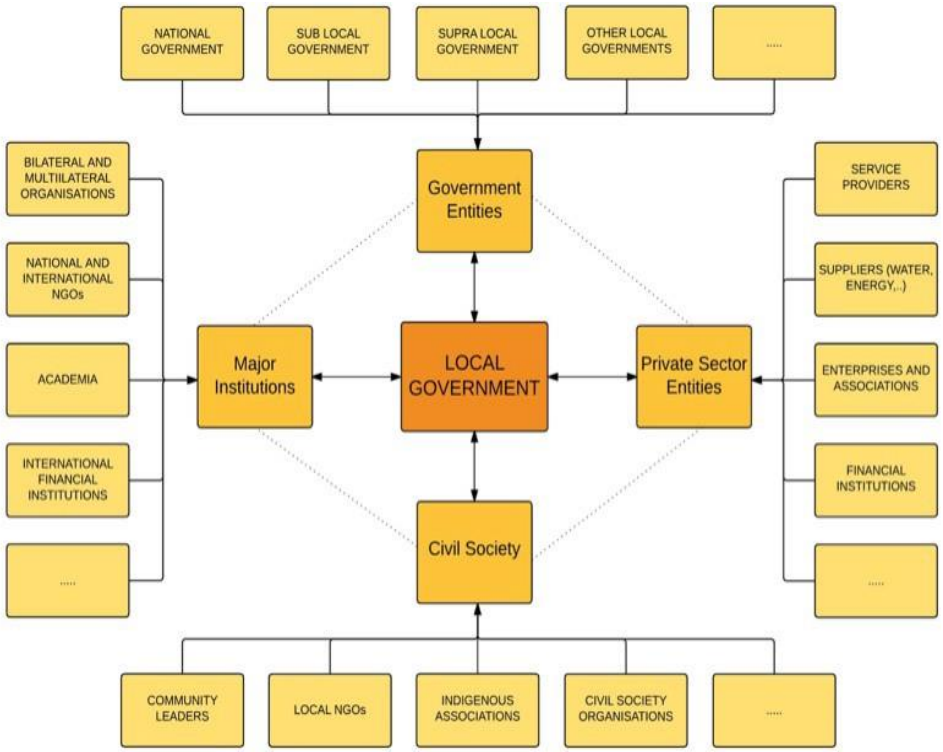
Risk-Sensitive Land Use Planning (RSLUP) involves mainstreaming DRM within the governance and operations of public and private institutions particularly in spatial and physical development plans. RSLUP incorporates DRM through institutional and legal reforms, plans, programs and projects that dictate land use, land management, and infrastructure development. Following figure states, the overall process of the RSLUP:

[3] Policy papers were prepared on several themes following the recently concluded Regional Development Strategy and Plan for the period up to 2035. The list of policy areas were obtained from the TORs for preparing the Regional and Local Development Strategy and Plan by RAJUK.



Following are some general principles that the JV is indented to apply to land-use management in the context of risk reduction strategies:

1. Land-use management plans form a shared basis for sustainable development and risk reduction strategies
2. Land-use management operates at different geographical scales, which require different ranges of management tools and operational mechanisms
3. Land-use management involves legal, technical, and social dimensions
4. Land-use management encompasses integral services and individual sectorial interests
5. Successful land-use management plans will confront challenges
6. Successful strategic land-use management requires essential resources

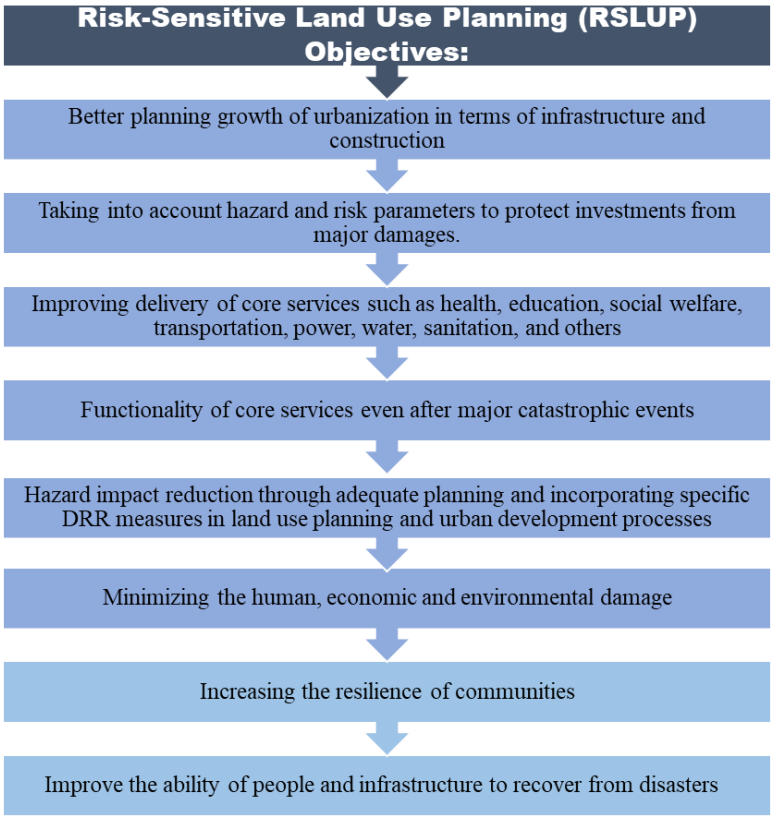


4.4.2 Urban Risk Management and Planning

Although the potential role of urban planning in the mitigation of earthquake damages is often mentioned, the number of cases as plans or implementation in this area is very rare. Methods and tools that could be employed in such professional and administrative interventions remain therefore relatively undeveloped. These are predictive models for decision makers, whose merits depend on the built-in assumptions, rather than operational tools that help local authorities or communities in action. Four different types of planning could be identified in relation disasters:

1. Recovery planning
2. Planning for emergency preparedness
3. Mitigation planning
4. Resilience planning

It is in the third category that the Risk Sensitive Master Plan takes place. 'Disaster Preparedness' is considered largely as a technical task to be fulfilled once and carried out by the authorities. Secondary processes triggered are the implicitly expected mechanisms for the sustainability of the approach. The need therefore for a comprehensive urban mitigation mode of conduct that extends conceptions of 'preparedness', and serves for sustainable resilience is a real one.



4.4.3 Risk Analysis in RSLUP

The task comprises of the following risks, for which the scope, problems, risk management methods, and responsible bodies will be defined.

- Macro-Form Risks
- Risks in Urban Texture
- Risks Related to Incompatible Uses
- Risks of Productivity Loss
- Risks in Special Areas
- Open Space Scarcity Risks
- Risks Related to Hazardous Materials
- Vulnerabilities of Historical and Cultural Heritage
- Risks in Lifelines
- Risks in Building Stock
- Risks Related to Emergency Facilities
- External Risks
- Risks of Incapacitated Management

4.4.4 Vulnerability Data Analysis and Indicators

- **INDICATORS**

Since the purpose is to investigate the vulnerability against earthquakes and flood with a comprehensive viewpoint, seismic vulnerability must be studied by taking all influential factors into account. Thus, after reviewing the literature, regulations, viewpoints and experiences of experts and

taking the available data for influential indicators including geotechnical, structural, social and physical distance from needed facilities and away from dangerous ones into consideration for each residential fabric in census units, the main sub-indicators are extracted as follows:

- Geotechnical indicators
- Structural indicators
- Social indicators
- Indicator of physical distance to needed facilities and away from dangerous facilities

- **GIS METHODOLOGY**

The combined method of GIS–AHP is a suitable tool for spatial issues including seismic vulnerability of cities. A range of qualitative and quantitative indicators must be taken into account to investigate the seismic vulnerability of an area. One of the main steps to realize this goal is using AHP to consider the indicators simultaneously with regard to the importance of each and using GIS to manage, integrate and analyze the data.

AHP allows the decision-makers to change a complex problem to a hierarchical structure by identifying the elements of decision-making such as goal, criteria (indicators) and alternatives (sub-indicators), prioritizing and relating them to each other and simplifying the analysis and decision-making.

- **MULTI-HAZARD APPROACH**

Beside the Seismic hazards, Flood is also a big of concern in land use management. The usual adoption of structural measures is no longer enough when dealing with flood risk. There is a limit to the efficacy of traditional structural measures, since they work up to a point, but won't eliminate risk. These measure must therefore be complemented by non-structural measures in order to reach an acceptable level of risk.

Land use planning incorporates many of such non-structural measures, and can provide solutions for some of the problems it has itself created. For instance, land use changes and urbanization have changed the frequency and volume of floods. Changing land use approaches could therefore contribute to reducing risks. Some of the challenges for land use planning related to flood risk include:

- Understanding and assessing the risk
- Producing locally relevant information, in an appropriate language (it is often only available in highly technical jargon)
- In many cases, there is no legislation mandating incorporation of risk on land use plans
- Cities have low technical capacities and scarce human resources.

- **GEOTECHNICAL AND GEOPHYSICAL STUDIES**

Within the context of the works it's foreseen to prepare the related geotechnical and geological properties of subsurface soil and rock and also seismological properties within the proposed area in order to use for design and construction phases. Proposed project includes geotechnical and geophysical investigation for Development of Risk Sensitive Land Use Planning practice. Studies will be carried out though the city of Dhaka, Bangladesh. A comprehensive study on a city wide geotechnical and geological investigation for the purposes of microzonation as stated above in the scope of work is as Follows:

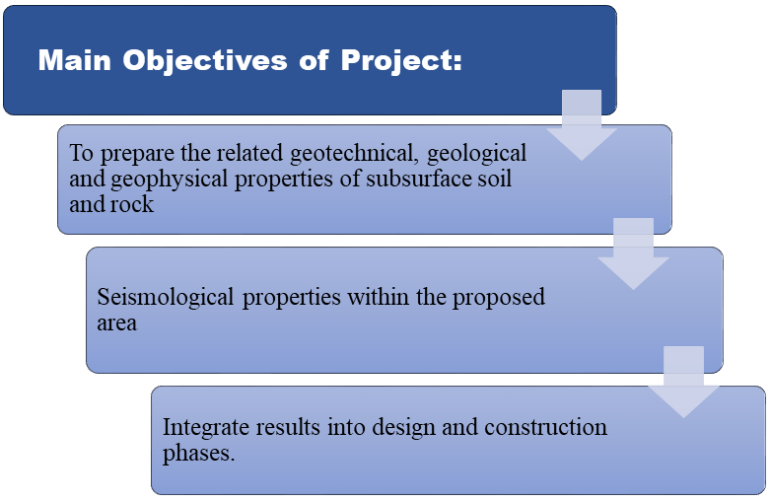
- Review of existing reports and records that include available geotechnical studies
- Conduct detailed geotechnical and geophysical studies of all DMDP area of Dhaka City for the purpose of microzonation. The proposed scale for geotechnical data collection for the microzonation is as follows:
- Homogeneous sub-surface – 0.5 km x 0.5km to 2 km x 2km
- Heterogeneous Sub-surface – 0.1 km x 0.1 km to 0.5 km x 0.5km
- Site response analysis using equivalent linear or nonlinear analysis is to be carried using inputs obtained from geotechnical and geophysical investigations.
- A detailed liquefaction and amplification hazard analysis based on deterministic and probabilistic methods need to be carried. This level of seismic microzonation provides detailed maps of site classification, spatial variation of bedrock as well as surface amplifications, liquefaction and landslide.
- The geotechnical study shall include site and laboratory investigation to define subsurface soil profile for further static and seismic slope stability analysis (Limit State Equilibrium Analysis) and sieve analysis.
- Drill boreholes and carry out geotechnical in-situ (SPT, CPT) & geophysical direct tests (such as cross hole or seismic up, down or SCPT tests which provides direct measurement of seismic wave velocity. Plan at least one borehole at minimum for a set of nine grids (set of 3x3 grids).
- Depth of drilling ideally should go up to the bedrock level. However, the minimum recommended depth of borehole for the purpose of seismic microzonation should be between 30 – 60 m until unless bedrock is met before.
- At the same bore hole location obtain shear wave velocity profile from the indirect tests such as MASW, SASW, seismic refraction, reflection etc. (specific recommendation over these methods is made in the concluding chapter), so that the test results from the direct and indirect geophysical tests can be compared at the selective grid points.
- Microtremor studies will be conducted by means of geophone for geophysical studies.
- Site investigations should be carried out with either small track mounted or mobile auger rigs, thus limiting site disturbance and environmental impacts. In the area where the investigation is impossible alternative soil investigation methods shall be proposed (i.e. meshing, CPTs…etc)
- Prior to commencement of site investigations, the project team shall obtain from the City's representatives the underground utility locations for every property being investigated.
- Research of geological conditions by evaluation of geotechnical conditions distinctive to the site at site and by analysis and tests shall be performed in laboratories.

It has imperative importance to mention that the equipment, accessories and other required tools for the purpose of geotechnical and geophysical studies and microzonation should be provided by the Consultant.

More importantly the consultant will do the capacity building for the staff of the PIU during the consultancy works and in particular provide trainings with onsite implementation of the activities. Technology transfer will as well be a part of the responsibilities of the consultancy firm. At a minimum following information shall be profiled for each site geotechnical studies conducted:

a) General Geology on the basis of the investigated region
b) Geotechnical information for evaluation of hazards at ground surface, local site effects and liquefaction
c) Geological zoning of the area considering different indicators
d) Engineering Geology according to soil drilling performed at investigation site
e) Filling material and underground layers until 20 meters
f) Slope stability and liquefaction potential
g) Determination of the liquefaction potential and ground water level
h) Water presence
i) Seismic fracture measurements performed at site, Compaction wave speed of each layer
j) Profile resistance records
k) Soil bearing stress
l) Soil group and class and spectrum characteristic periods Ta=, Tb=.
m) Vertical soil reaction coefficient value Ks=Ton/m 3.
n) Foundation type and any other recommendations

- Prepare City Wide Geotechnical Report compromising all the information mentioned above.



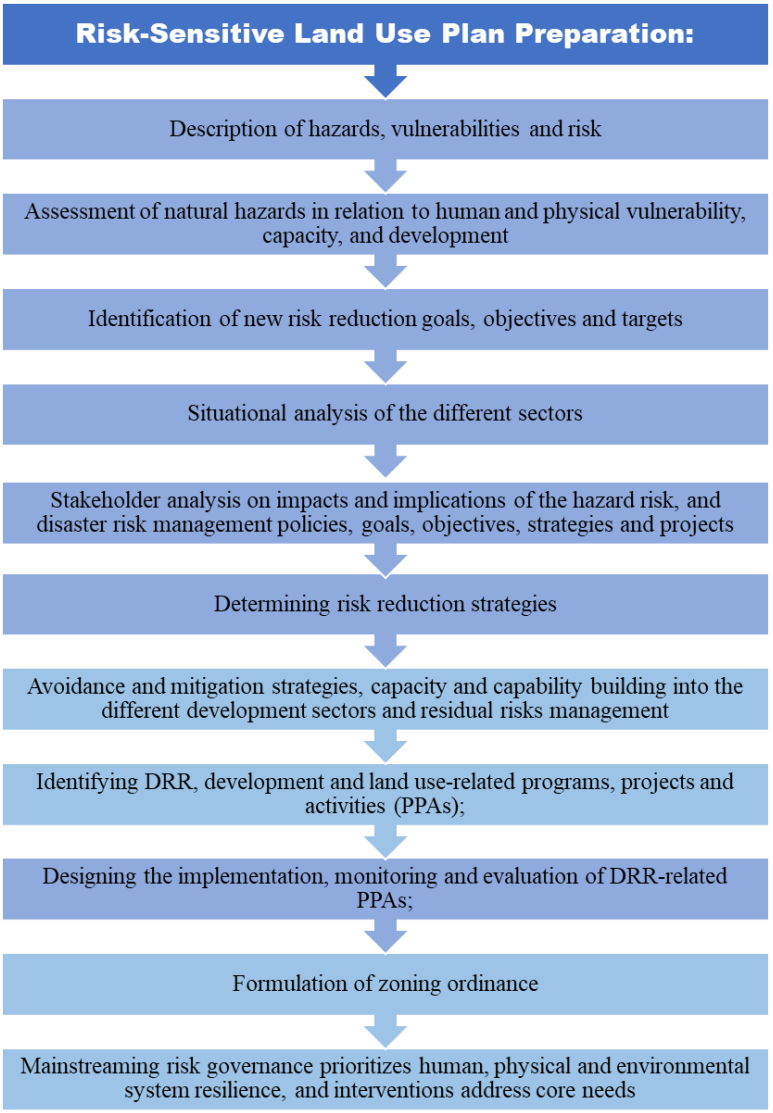
4.4.5 Scope of RSLUP Work as ToRs

Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas:

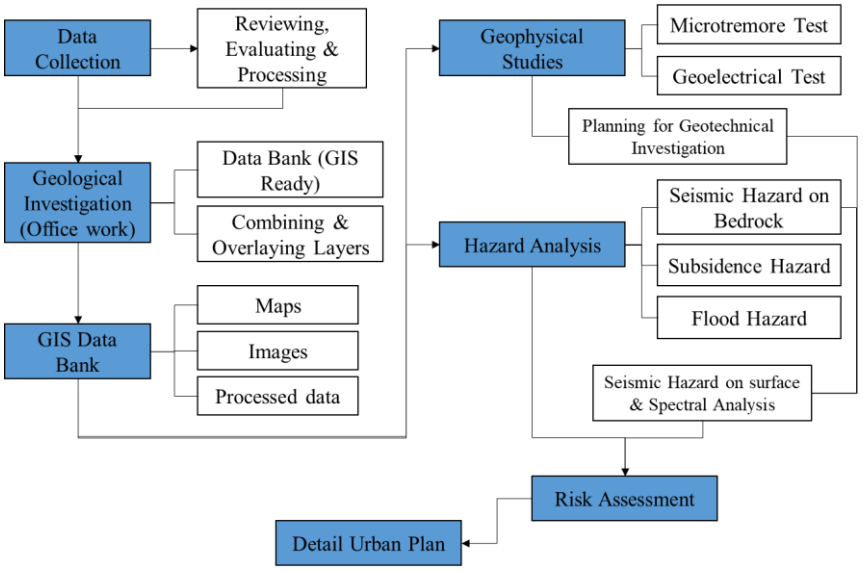
- Based on the findings, propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning. The framework should address the following:
  - Identifying mainstreaming entry points for DRM in the Dhaka planning system (plans, process, legal and institutional and implementing tools), and related rationales;
  - Provide the analytical process to assess responsiveness of land use planning practice and its plans to DRR;
  - Relate to the findings of Stage 1 and explain linkages of relevant data to the mainstreaming methodology, in particular on interpretation of risk outputs and indicators to land use management in Dhaka
  - Provide alternative and lubricating options for keeping agricultural land as protected area, and mechanism of indicating soil bearing capacity in land plot number map.
  - Propose options for risk reduction, and financial and economic viability of selected risk reduction strategies for achieving long term urban resilience in Dhaka, including approaches for land management;
  - Propose policies specific to the needs of the urban poor, including the provision of low-income housing and upgrading informal housing areas;
  - Provide examples on improving Detailed Area Plan/Local Plan and Land Readjustment Plan for selected areas;
  - Elaborate on the implications on land management and land acquisition;
  - Define the institutional arrangements, including the organizational and regulatory frameworks required to secure development and investments in RSLUP;
  - Elaborate on the coordination mechanisms among relevant agencies and departments involved in urban development activities;
  - Define a phased implementation plan and/or priorities for these investments;
  - Complete the Mainstreaming paper considering input from stakeholders (refer to participatory process below.)
- Develop a Draft Greater Dhaka Risk Sensitive Land Use Strategy with a vision statement, specific objectives and goals, elaboration of the outputs and outcomes, constraints and resources, risk factors, safeguards, and monitoring and evaluation indicators. The Strategy should be aimed at institutionalizing the proposed mainstreaming framework.
  - Include benchmark criteria for RSLUP practice in Metro-Dhaka;
  - Include comparing with experiences in other countries (develop or developing countries[4]) that are relevant to Bangladesh;

[4] Examples of developing countries could be Philippines and Nepal.

- Develop outreach material composed of illustrative maps, brochures and exhibits for examples of risk-sensitive land use management approaches in Dhaka stressing the socio-economic and cultural benefits.
- Integrate the Risk Sensitive Land-use strategy into national master plan studies
- Develop a plan for urban expansion and commensurate land servicing with adequate infrastructure;
- Deploy the conditions for the provision of adequate, affordable housing as an alternative to integrated, locally managed urban development and housing programmes with national support mechanisms.
- Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the Draft Dhaka Regional and Urban Resilience Strategy.
- Complete and submit the Greater Dhaka Risk Sensitive Land Use Strategy



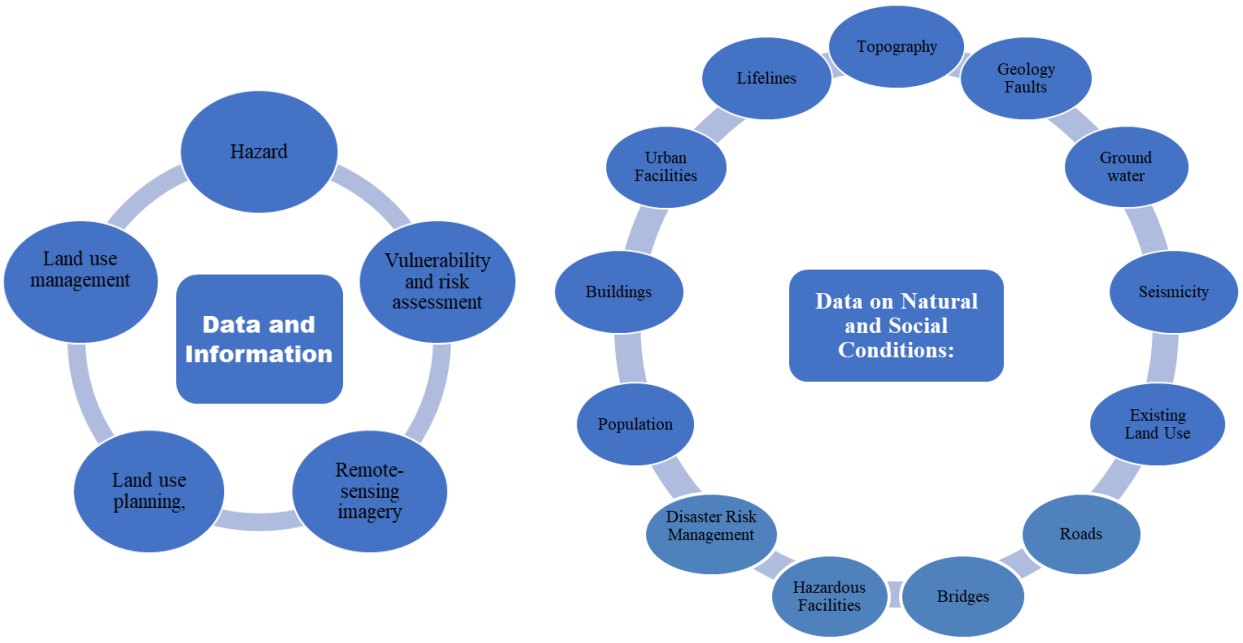
The activities within the scope of the project along with requirements for each stage are defined in following sections:



Task 1: Geographic Database Development

Task 1-1: Data Reviewing, Evaluating and Processing

- The data gathered from site
- Relevant past studies
- National goals and strategies and providing general data on urbanization
- Existing natural and social conditions of the study area



- Catalog the collected “exposure” data as “Planning Knowledge Base", determining potential gaps in data.
- Gathering and processing information to provide a clear picture of the development situation of the city.
- Field visits and ground truthing

- Current situation analysis preparing a sectorial profile and thematic maps of the area.

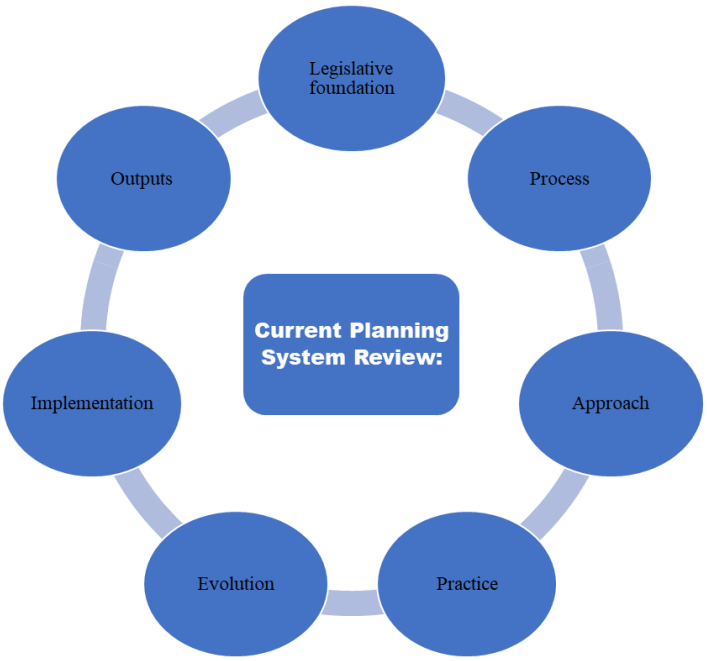
Task 1-2: Conducting Geological Investigations

Task 1-3: Developing Databank GIS including Maps, Images and Possess Data

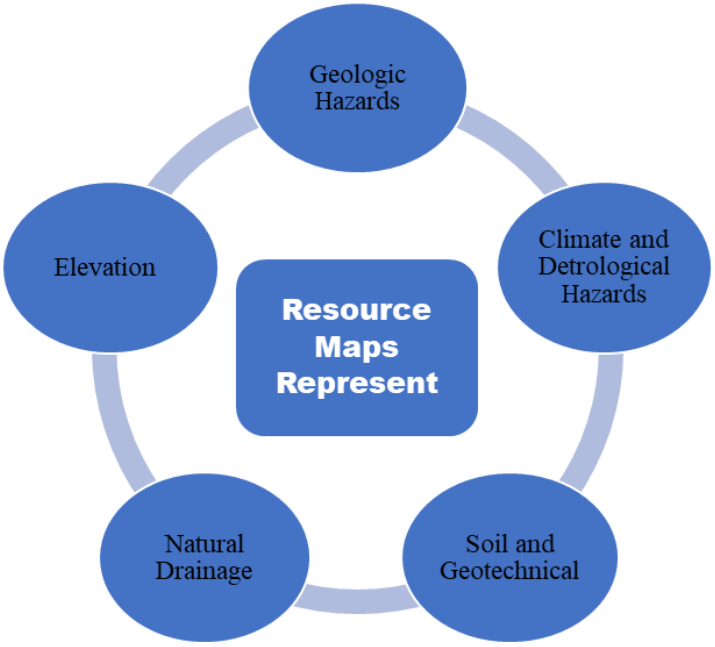
- Comprehensive Evaluation of Vulnerability
- Design of Geographic Database
- Data Collection and Input (Digitization)
- Data Analysis Unit
- Integrate of the exposure data into a GIS system enabling spatial data analysis for Dhaka
- Validation workshops with PWG confirming the validity of data and sharing knowledge and capacity building through the training on the Planning Knowledge Base.

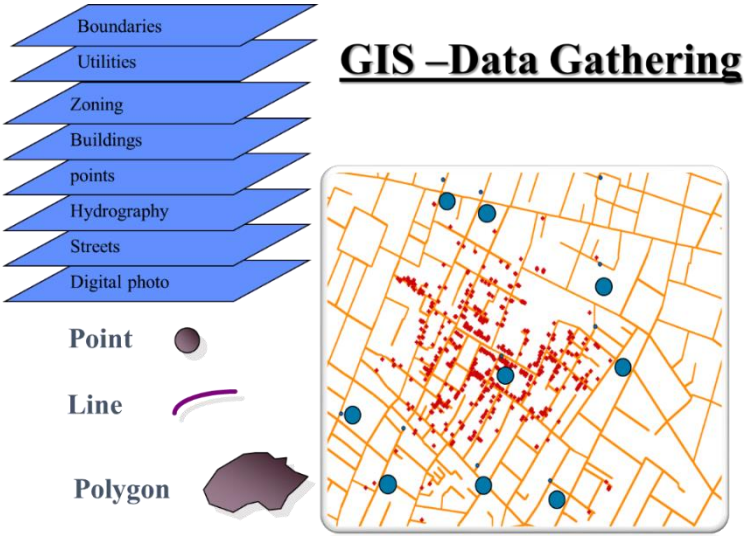
Task 1-4: Preparing Situation Analysis Report and GIS Database Guideline

- Review and document the current planning system



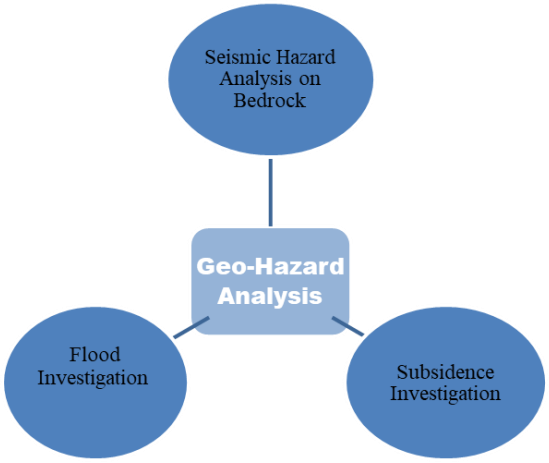
- Review and document approach and content of the current town-plans and specific plans (regional and detailed)
- Assess gaps in planning process and identify potential shortcomings and conflicts in plan development and implementation
- Review of Resource Maps.





- Validate assessment with PWG and RAJUK PIU-PIC
- Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.

Task 2: Geo-Hazard Analysis

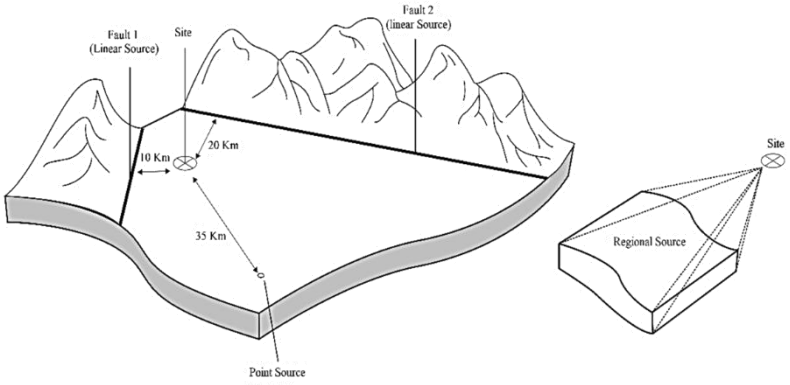


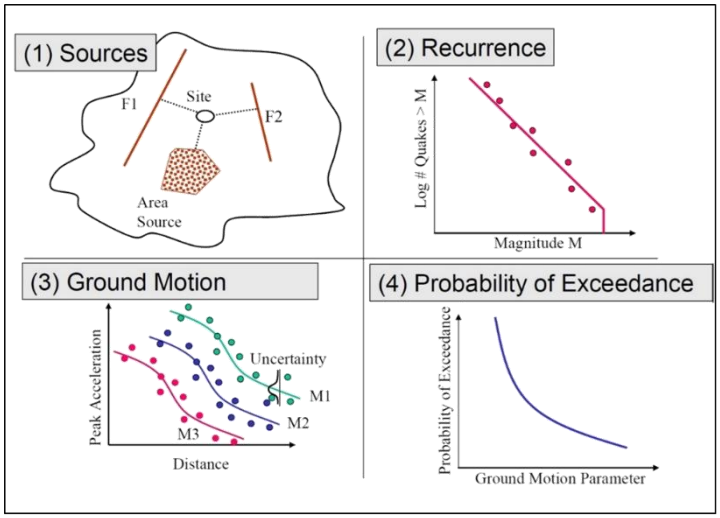
Task 2-1: Assessment of implications of hazards, vulnerabilities and risks on the current regional boundary in the following contexts:

The nature, scale and location of major proposed land uses including new city development, residential and industrial areas and strategic community, recreation and commercial uses.

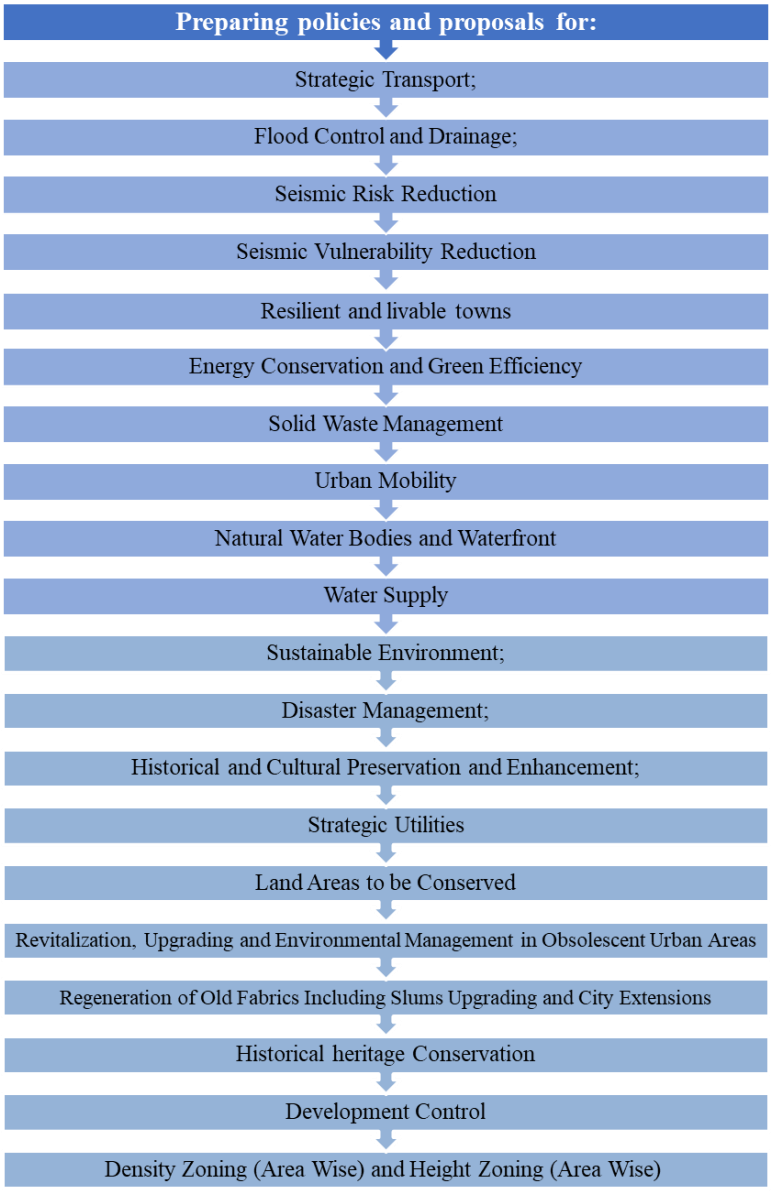
Seismic Hazard Analysis

The study of strong ground motion and the earthquake hazard in any project plays a crucial role in the sustainability and economic benefits of the project.





- **Step 1.** is the definition of earthquake sources
- **Step 2.** is the definition of seismicity recurrence characteristics for each source
- **Step 3.** is estimation of the earthquake effect
- **Step 4.** is determining the hazard at the site



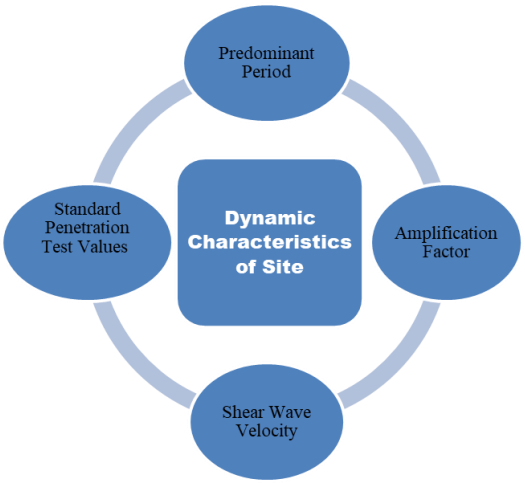
Task 2-2: Seismic Hazard analysis on bedrock including PHA and DHA

Task 2-3: Subsidence investigation with specific focus on liquefaction

Task 2-4: Flood and Cyclone investigations and Flood Hazard Analysis

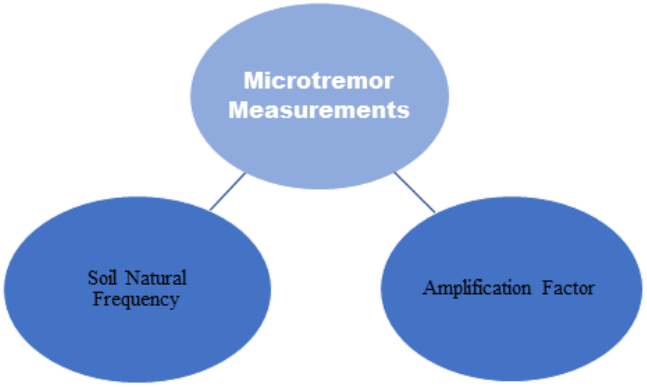
Task 3: Microzonation Studies

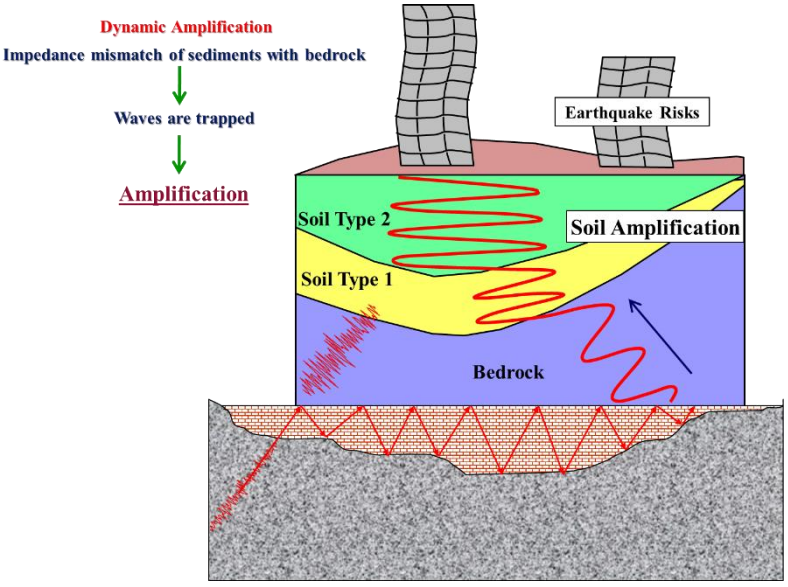
Task 3-1: Determining the dynamic characteristics of site



Task 3-2: Microzonation studies based on ambient vibrations measurement

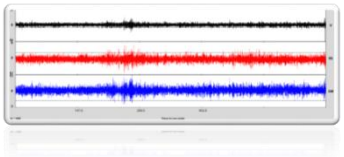
Task 3-3: Conduct 400 Microtremor measurements

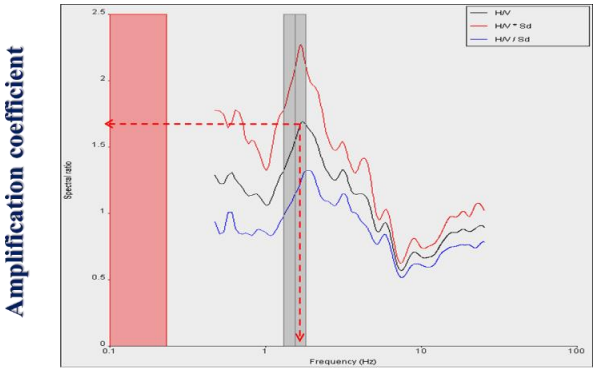




H/V Data Acquisition

- Proper sampling frequency
- Leveling sensor on flat ground and set the seismograph toward geographic north
- Selection of maximum value for gain level
- Performing measurements in quiet hours
- Recording at least for 30 minutes to achieve enough seismic cycles
- Recording transient noises

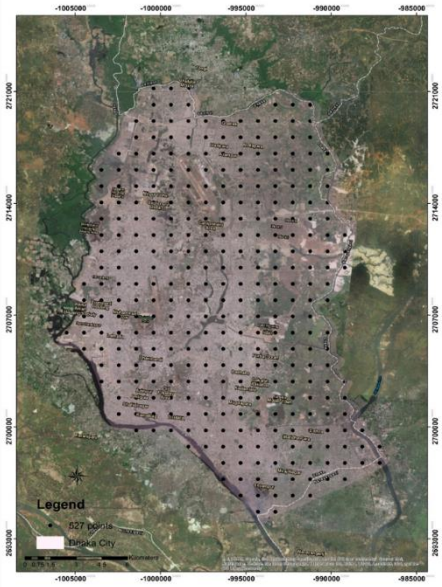




Dominant Frequency

1. **Calculation of average horizontal to vertical spectral ratio (H/V)**
2. **Selection of acceptable peak and determination of the dominant frequency and amplification coefficient**

Preliminary Arrangement of Microtremor Stations at The Study Area Border

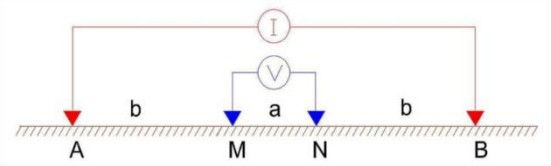


Task 3-4: Microzonation based on ambient noise data.

Task 3-5: Conduct 200 Geoelectrical and Geophysical tests using Resistivity Data Acquisition.

Resistivity Data Acquisition

Surface electrical resistivity surveying is based on the principle that the distribution of electrical potential in the ground around a current-carrying electrode depends on the electrical resistivity and distribution of the surrounding soils and rocks.



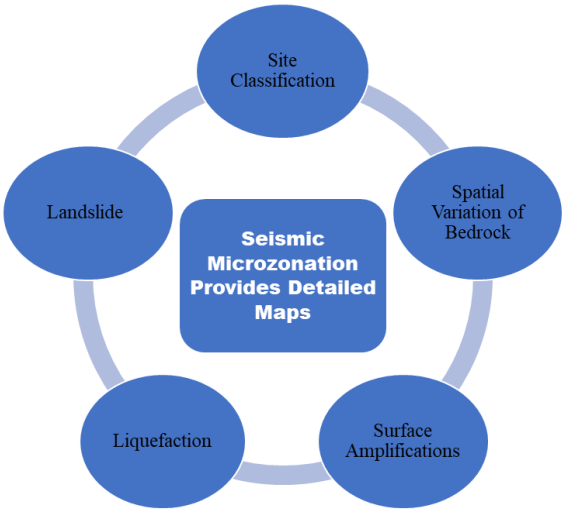
The usual practice in the field is to apply a direct electrical current (DC) between two electrodes implanted in the ground and measuring caused potential between two additional electrodes that lies between current electrodes.

Task 3-6: Preparing an assessment report based on studies conducted

Task 3-7: Providing a guidance map to borehole location election for SPT and CPT and shear wave velocity

Task 3-8: Verification and approval of the geotechnical studies (WP2):

- Site response analysis using equivalent linear or nonlinear analysis based on geotechnical studies
- A detailed liquefaction and amplification hazard analysis based on deterministic and probabilistic methods need to be carried.



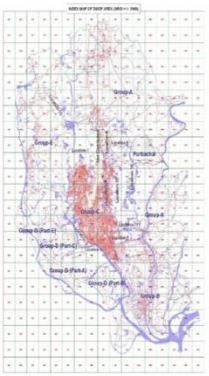
Task 4: Geotechnical Studies

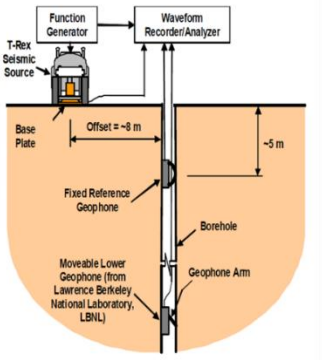
- Geotechnical/Geological/Geomorphological Tests

Seismic Downhole Tests

Total 400 number of test will be conducted. So, for Dhaka city with area approximately 1500 km2, One (01) Seismic Downhole test will be conducted for each 37.5 km2.

Following data will be collected from Seismic Downhole test
❖Shear Wave Velocity





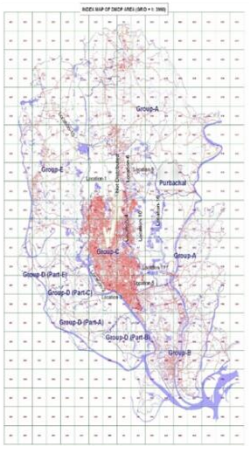
- Standard Penetration Tests (SPT) and Cone Penetration Tests (CPT)

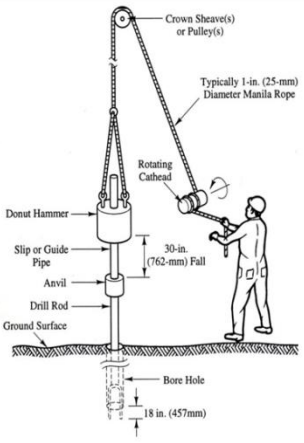
Standard Penetration Test (SPT)

Total 15,000 meter test will be conducted. Length of each will be at least 30 m and total 500 SPT test will be conducted. So, for Dhaka city with area approximately 1500 km^2, One (01) SPT test will be conducted for each 3 km^2.

Following test will be conducted from collected soil sample:

- ❖ Atterberg's Limit Test
- ❖ Specific Gravity
- ❖ Grain Size Distribution
- ❖ Shrinkage and Swelling
- ❖ Consolidation Test
- ❖ Shear Test
- ❖ Triaxial Shear Test
- ❖ Unconfined Compressive Test



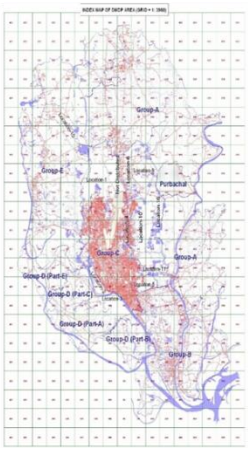


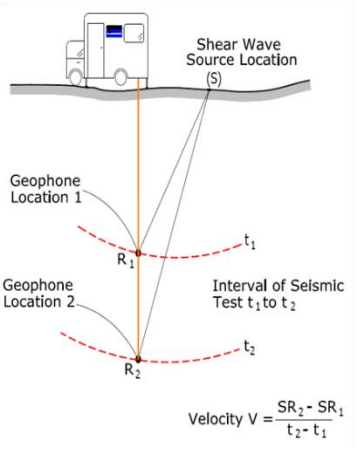
Seismic Cone Penetration Test (SCPT)

Total 400 number of test will be conducted. So, for Dhaka city with area approximately 1500 km2, One (01) CPT test will be conducted for each 37.5 km2.

Following data will be collected from SCPT test

❖Shear Wave Velocity





Task 5: Seismic Hazard Analysis of Dhaka

Task 5-1: Developing GIS-based geology, seismotectonic and seismic source and seismicity models for city of Dhaka

Task 5-2: Development of seismicity model

Task 5-3: Seismic hazard assessment

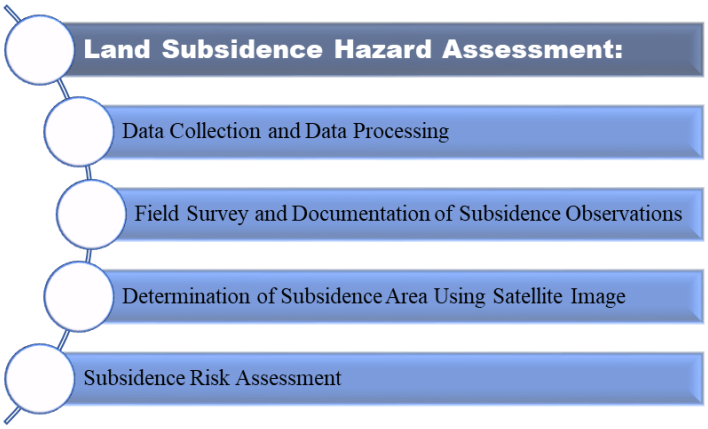
Seismic Hazard Assessment Steps:

- Selecting up to 7 strong ground motion attenuation models compatible with the regional and local tectonic setting
- Estimating the V_{S30} distribution based geotechnical data or the USGS proxy model.
- Probabilistic Seismic Hazard Assessment (PSHA) using a decision tree approach under return periods of 50, 75, 475, 2475 and 10000 years.
- Deterministic Seismic Hazard Assessment (DSHA) based on the expert judgment and identified scenario earthquake.
- Disaggregation of SHA:
  - Defining the contribution of different magnitude and distances to overall hazard.
  - Site scenario earthquake as primary contributing source to the design ground motion at each of the design levels.
- Validation the output results such as distribution PGA on the bedrock and surface soil, and hazard exceedance curve.
- Estimating design and response spectrum:
  - Colleting the accelerographs of the area under investigation
  - Calculating the average of statistical model and estimating response spectrum

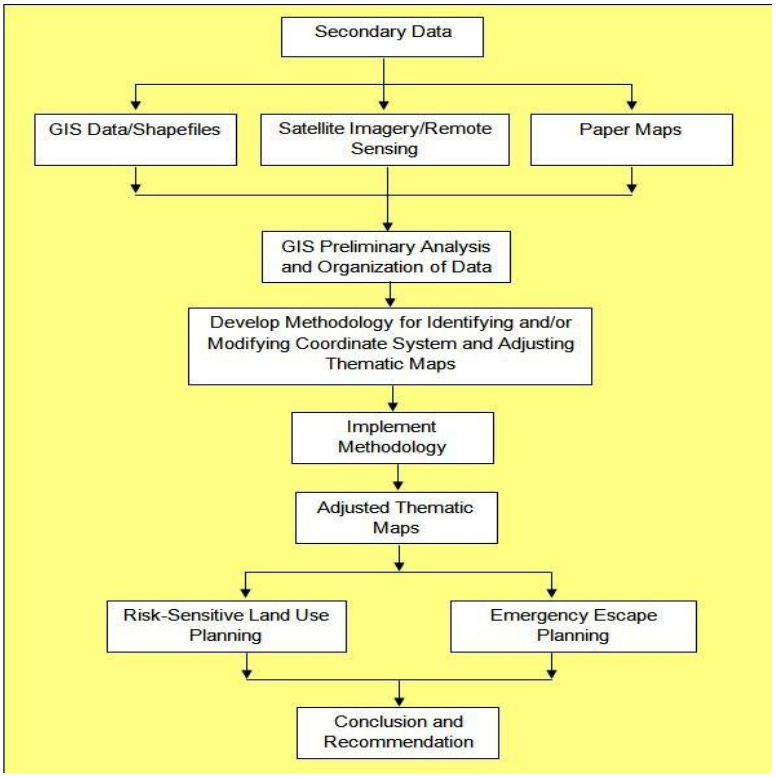
Seismic Hazard Assessment Achievements:

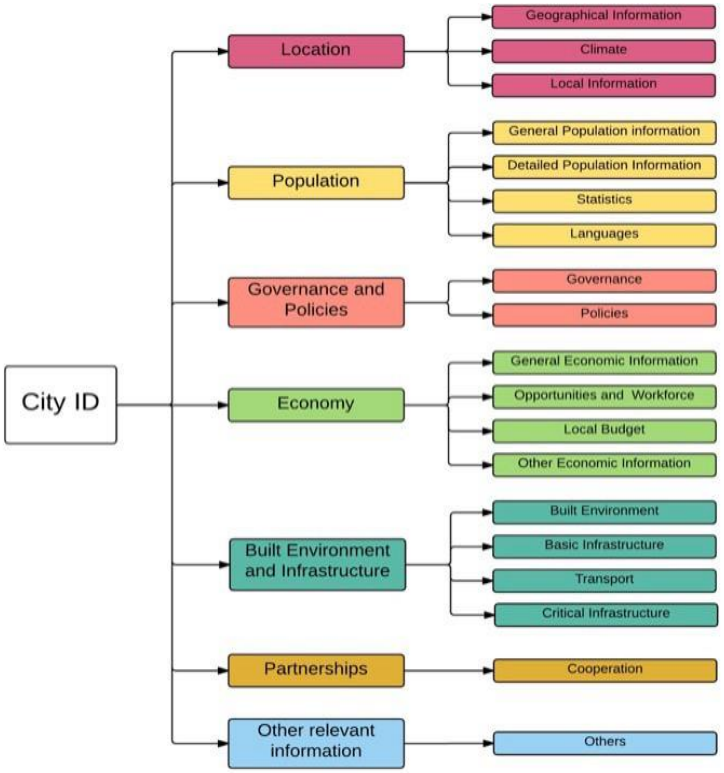
- Development of the strong ground motion design parameter for different hazard levels and possible scenarios
- Development of respective seismic hazard map at surface level

Task 5-4: Conducting Land Subsidence Hazard Analysis



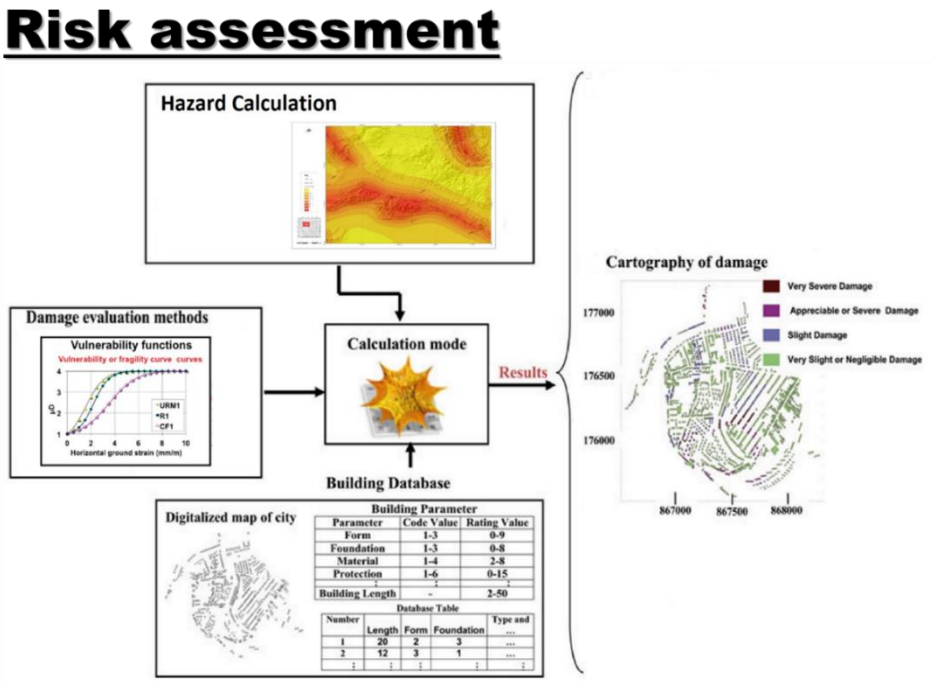
Task 5-5: Conducting Flood Hazard Analysis


Secondary Data
GIS Data/Shapefiles
Satellite Imagery/Remote Sensing
Paper Maps
GIS Preliminary Analysis and Organization of Data
Develop Methodology for Identifying and/or Modifying Coordinate System and Adjusting Thematic Maps
Implement Methodology
Adjusted Thematic Maps
Risk-Sensitive Land Use Planning
Emergency Escape Planning
Conclusion and Recommendation


City ID
Location
Geographical Information
Climate
Local Information
Population
General Population information
Detailed Population Information
Statistics
Languages
Governance and Policies
Governance
Policies
Economy
General Economic Information
Opportunities and Workforce
Local Budget
Other Economic Information
Built Environment and Infrastructure
Built Environment
Basic Infrastructure
Transport
Critical Infrastructure
Partnerships
Cooperation
Other relevant information
Others

Task 6: Vulnerability and Risk Analysis of Dhaka

- Damage and Loss Analysis
- Risk and Vulnerability Assessment of Whole Dhaka City- Including Building Stocks and Lifelines



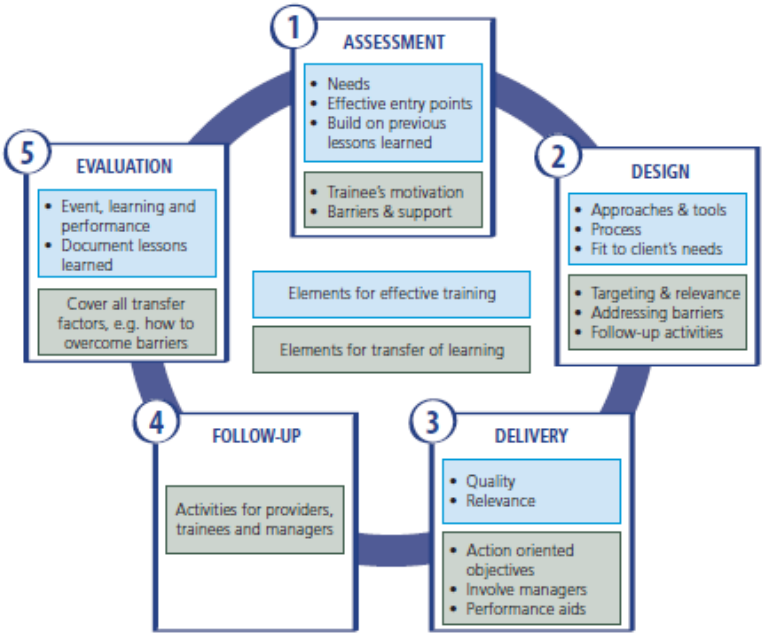
Task 7: Land Use Mapping and Integration of Risk Information with the Physical / Structural Plan of RAJUK Area

- Development of the Plan
- Trainings and Capacity Development Endorsement and Way Forward Impact Assessment
- Updating Database/GIS Based

4.5. Stage 3:

4.5.1 General

Within the context of the responsibilities defined in the ToR JV will develop and train RAJUK's town-planning professionals and related specialists on a well-illustrated and structured step-by–step approach on how to utilize technical assessments, interpret results and integrate disaster risk reduction parameters and objectives into Metro-Dhaka City's land use plans, Detailed Area Plans, Zoning Provisions and the decision making processes involved in the development and implementation of land use and construction control regulation.



Overall Training design Approach

4.5.2 Trainings and Capacity Building for risk-sensitive planning

- Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans.
- Develop the modules, references and training programs for RSLUP in partnership with a Bangladesh academic institution offering having an Urban and Regional Planning Graduate Degree Program.
- Identify practitioners and researchers who will undertake RSLUP training, field work exercises and site-visits.
- Improve Monitoring and Evaluation focusing on tool development, internal exchanges and partner mobilization,
- Learn from other experiences associated with capacity development focusing on awareness raising and comparative evaluations,
- Elaboration and test of operational recommendations including:

  - Action-oriented guidelines and tools focusing on priority areas such as risk sensitive urban planning, design, infrastructure, housing, employment generation, governance and finance
- Mobilize the resources for RSLUP training and conducting training of trainers (ToT) activities
- Conduct of trainings (e,g, on-line, face to face) on risk-sensitive planning for Metro-Dhaka
- Use platforms such as GEODASH and the Planning Knowledge Base developed in Stage 1 as training resources.
- **Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the RSLUP training.**
- **Complete a RSLUP Guidebook as an update to the RSLUP Guidebook produced by Bangladesh Earthquake Urban Resilience Project.**

NKY+PROTEK + Sheltech JV has already developed the Training Program Implementation Report aiming to train RAJUK's town-planning professionals and related specialists on following topics:

1. Training on Risk Sensitive Land use planning
2. Training on Hazard and Risk Assessment
3. Training on urban resilience
4. Training on disaster risk management
5. Training on national urban policy
6. Training on ecosystem services Cities and climate change – advanced
7. Training on urban flood management and disaster risk mitigation
8. Training on environmental assessment for water-related policies and developments
9. Training on river restoration and rehabilitation
10. Training on post disaster needs assessment (pdna)
11. Training on earthquake resistant rural construction
12. Training on land and housing
13. Training on urban management and development theory
14. Training on slum upgrading
15. Towards sustainable development
16. Training on urban waste management
17. Training on structural and non-structural hazard mitigation in urban lifelines and sensitive critical infrastructure building and high rises
18. Training on applying resiliency in vernacular architecture in Bangladesh's rural areas

The JV will hold courses of following stakeholder's categories:

- Training courses for managers and experts
- Training courses for the RAJUK professionals
- Capacity building training courses for public awareness-raising

It is worth noting that the training courses will be interactive and based on mutual learning. In each course the participants are required to have related educational background and professional experience.

The intended goal within the project course of duration is to train 200 experts and decision makers in the fields of urban resilience, disaster risk management and sustainable development or any of selected 5 topics mentioned above. We will mutually decide on this issue with RAJUK.

5. Project Management and Organization

The main objectives of the services offered by the Proponent Group can be summarized as follows:

- Management approach structured and based upon an organized planning, programming and control process (Project Management, PM);
- Respect of planned deadlines, costs and quality levels;
- Management of the activities planned for the achievement of the objective, favoring the efficient interaction of resources;
- Monitoring of the ongoing activities and timely reporting of problems that may emerge in order to prevent delays and malfunctioning;
- Availability of the technical and organizational support needed for the management and control of the activities provided;
- Guaranteeing Partners and Client with the required technical assistance during all phases of implementation of the Program, including activities linked to technical and administrative assistance, with the aim of perfecting the end product;
- Guaranteeing Partners and Client the possibility of supervising ongoing initiatives constantly and intervening in solving any problems that may arise, through dedicated resources and structures during the various phases provided.

Nowadays project complexity requires the elaboration of a General Plan of Interventions, aimed at planning the activities of all the Actors involved in the realization of interventions. In addition to those responsible for Project Management and Construction Management and for the various Design and Execution phases, it will also involve the Competent Bodies and Institutional subjects involved, local and non-local. The General Plan of Interventions includes technical and administrative activities and procedures approved. It constitutes the definitive reference point for Management in terms of managing and coordinating all the Actors involved. The complex nature and the multidisciplinary character of the Program require a system of procedures, operational methods and codified rules, provided by the Companies' Quality Assurance Systems, in order to integrate the various functions which, constitute Project Management, in particular, the Quality Assurance Management is aimed:

- At the integration of the various phases of the whole Program
- At guaranteeing the respect of the procedures (also through the planning of training and education sessions for the components of the Working Group)
- At verifying the punctual application of the quality procedures by suitable internal inspections.

5.1. IT Tools in Project Management

The organizational complexity intrinsic to a PM structure and the simultaneous presence within the working group of different professional figures who may be in different places with different requirements and the need to interact with other entities lead to the necessity to follow pre- established procedures codified within the organization. These procedures can be best used, distributed and managed if they are planned using network technology, through the use of specific software all requirements. Thus definitively accelerating approval procedures and informative and decision-making processes.
These software tools constitute an infrastructure capable of increasing the productivity and organizational efficiency of a complex system, connecting all the figures interacting among each other

on a network and in real-time. A management system based on network technology and integrated with a suitably studied and implemented platform, the PM Workspace, will enable the possibility of constantly interacting within the Working Group and with any other Subject and/or Local Body involved in the management and control of the initiative, through technological tools such as discussion forums and video conferences. This structure will also enable the various concerned Subjects to constantly access the working documentation during the definitive phase and in intermediate review phases, according to the access profile of the system for each phase. The functions of the Project Workspace in the coordination of Project Management will enable the various involved Actors to communicate between each other through the user interface, and thus be simultaneously involved in the realization of the Program, with the following advantages:

- To provide a handy and effective workspace for team members to coordinate schedules, organize documents, and participate in discussions - both within the organization and over the extranet;
- To easily author and manage documents, and help to ensure their integrity with features such as the requirement of document checkout before editing, the ability to view past revisions and restore to previous versions, and the ability to set document-specific security;
- To manage the digital archive of reports and certificates, and ensure easy access by the Client;
- To define and control the various access to information levels;
- To view plans, Gantt diagrams and updates, which will constantly be available to the PM Working Group and the Client;
- To facilitate the updating of the status of progress of the project and the end forecasts;
- To allow synthetic viewing of information concerning the project. Summaries and graphic representations of both the technical and economic progress of the intervention will be available to the Client and to the Management level of the Working Group, to ensure an immediate outline of the situation;

As a matter of fact, the PM Workspace constitutes a consolidated management tool capable of making the actions and assessments made by the Project Manager more efficient, and favoring both interaction between resources and respect of the project deadlines and costs.

5.2. Coordination between the Consultant and the Client

It is planned that Project Manager, within his own role, be in charge of managing and taking care of the relations with the Client, Final Inspections Commissions, competent Bodies and Institutions, providing any required information, support and advice. Within such a complex intervention, an effective management of the services mentioned above cannot leave the problem of dealing with all those aspects connected with the modalities of communication, coordination and sharing of information and documents aside. Resorting to the Management System introduced previously, i.e. the PM Workspace, made available to the Client and also easily accessible from electronic platforms eventually set up by the Client itself, will allow the PM Team to interact with the Client. AS a matter of fact, the PM Workspace will allow the Client and other authorized Subjects, both inside and outside the work group, the opportunity to have access to project documentation at any revision stage, be it intermediate or definitive. Through such a powerful tool of information sharing it will be possible to carry out successfully:

- Monitoring of in-progress activities;
- Any step at ensuring the necessary technical assistance to the Client throughout the various stages of the Project fulfilment;

- Any action aimed at guaranteeing to the Client the possibility to supervise the in-progress initiative constantly.

5.3. Risk Identification, Analysis and Management

The prevention and management of the possible critical aspects is beyond doubt one of the most significant parts of a complex Program and, in general, the more delicate aspects involved in exercising the role of Project Manager. The critical aspects must be managed in respect of the project goals in terms of times and costs. The working methodology and approach to problems, the planning of activities, constant supervision and assessment of activities are of fundamental importance for the achievement of these goals. The management of risks and critical aspects will be preliminarily carried out through the implementation of a Risk Matrix, for the purpose of:

- Identifying the general and specific areas of project risks;
- Assessing the entity of these risks to define their priority;
- Defining the actions carried out for the mitigation and/or elimination of the risks;
- Assigning responsibility for these actions to the components of the project team.

Each risk typology is evaluated with reference to its probability and severity occurrence. Risk analysis also involves the identification of mitigating actions aimed at the reduction/elimination of the risks in question. Dependently upon the category of the risk identified, the mitigating action could be of the following natures:

- Technical
- Organizational/Managerial
- Contractual

Risk management is carried out at a local level, and it therefore has the operational capacity to intervene directly and successfully in processes for the solving of problems connected to the management of relations with relevant Institutions and Bodies.

5.4. Control of Interventions

Control of the interventions will be carried out through a series of activities structured in Consultant's Project Control System, and involving:

- Time Control
- Cost Control
- Financial Control
- Trend Planning
- Reporting

The Project Control System will be integrated in the PM Workspace. In addition to the usual Office Automation features, the following tools will be adopted:

- Relational databases;
- CPM (Critical Path Method) programming tool
- Cost Control tool;
- Reports generation and management tool

5.5. Verification Methods to Assess the Program Objectives

The primary objective of PM is the elaboration of the Clients objectives. These are summarized under these terms:

- Operational objectives of the project;
- Economic objectives of the project;
- The Project Brief will be shared by parties involved in order to confirm the projects primary and secondary objectives as well as to define specific operational processes. This will present the basis for the Project Quality Plan, PQP.

The PQP defines the governing rules of the project and must be released as soon as possible so as to ensure smooth coordination of all the parties involved in the realization of the project. It is a dynamic document divided into a section dealing with procedures and a section concerning project updates and management of any variations. Shared by key personnel, the PQP enable availability of project procedures that are well planned, structured and yet simple.

5.5.1 General planning and control of the interventions (Project Control)

After receiving the assignment, the Consultant initiates, a series of meetings with the Client's team, with any consultants and authorities responsible for collecting data, reviewing, testing the feasibility and optimizing the General Plan of Interventions. The Consultant will proceed to verify all the information necessary for the document's definition including the mandatory permissible practices. The General Plan of Interventions will constantly be updated and shared. Coordination Meetings among the concerned parties will be held at least monthly, in order to ensure a joint verification of the reliability of current information and the consistency of updates with the deadlines and costs objectives. Coordination Meetings will be scheduled appositely on the basis of the exigencies identified by the General Plan of Interventions. The General Plan of Interventions will form the basis upon which the progress of the project could be assessed at any given time during the design phases, offering the Client a coherent and mutual basis concerning the project activities as well as their sequence and duration.
The General Plan of Interventions establishes milestones and objectives of the project including:

- Completion of various stages of buildings assessment/design for retrofitting and its validation;
- Revisions and approvals by the Client and the Consultant;
- Authorization requests where necessary;
- Documents preparation concerning offers;
- Tenders analysis; award of contracts;

5.5.2 Cost Planning and Control

- **Initial Cost Plan, Market Survey and Local Construction Environment Profile, Target Budget**

Initial Cost Plan Market Survey and Local Construction Environment Profile Target Budget
Once the assignment has been accepted, the Consultant will start calculating the Initial Cost Plan and the Market Survey and Local Construction Environment Profile, making sure that all opportunities to reduce costs or to accelerate the means of achieving the goals are identified. On the basis of the available design information, this process requires a breakdown of the Project into easily identifiable elements depending on the various WBS levels, and each one will be traceable to the sub-categories of the CBS (Cost Breakdown Structure). The structure adopted for the Initial Cost Plan and for the

Target Budget will be binding in terms of any subsequent estimates or accounts. It will therefore be possible to make more accurate estimates of the components of the Project according to the existing parameters and, where possible, to make analytical estimates both for the construction costs (Hard Costs) and for the indirect costs and consultancy fees for the Project (Soft Costs). The aspect of reconstructing the information requires close collaboration with the Consultant, and the departments of the Client involved. This must be carried out during specific, structured and inter –disciplinary meetings (Value Engineering meetings). The Initial Cost Plan will then be shown to the Purchaser and, once the unforeseen costs have been calculated and included, the Plan will be formally approved and entitled Initial Target Budget.

- **Design Costs Control System**

The Cost Control System is a management tool used by the Consultant for planning, assessing and controlling all the economic aspects of the project. After the task has been assigned, the Consultant will begin mobilizing and setting up the system, thus improving the Cost Control System. Initial emphasis will be on the development and the re -evaluation of the estimate for the entire project, starting with the Initial Cost Plan. The cost reports will be prepared simultaneously to the release of numerical calculations. They provide continuous updates on the basis of the information made available during the various phases, the current construction costs and the costs required for the completion of the project. The reports will be drafted so that they take into account possible trends which could have an effect on the original construction budget. The monthly cost report will enable the proper and accurate administration of the cash flows and management of the budget. Briefly, the Cost Control System enables:
The estimation, monitoring and controlling of the project budget;
A summary of the real costs incurred to date and a prediction of the future value of contracts;
The Customer to be provided with an updated forecast of the funds required in every fiscal month and year.
The Cost Control System is updated constantly and enables the re-assessment of the status of the current costs for each single element (during the planning stage and during the executive phase), thereby providing rapid decision -making support. It allows for the easy identification of potential additional factors - costs, impact of potential modifications and deviations from the budget.

5.5.3 Design Management

The Design Management services, which are merely proposals and aimed at the economic and construction optimization of technical proposals, can be effectively integrated with the Concept Development of the preliminary and executive projects. These are therefore control procedures applied to ensure that planning is either carried out directly by the Consultant or, as in this case, by suitable third parties. All the ongoing control activities are designed to avoid expensive re-designing and to safeguard the economic interests of the Client as well as the congruity of the project in relation to the estimate of the costs. Design Management therefore enables the assessment of the project and ensures that all the aspects deemed vital for the success of the operation are controlled by the appropriate Consulting Team:

- The property value of assets;
- The possibility of using assets for construction work;
- Suitability for use;
- The reduction of maintenance and management costs;
- Energy impact and emissions of assets during the construction and management stages.

- **Evaluation of the Design Program**

The evaluation of the Design Program should be considered, given the timeframe for the completion of the project, as one of the most important aspects for the success of the project and occupying the property complex. The assessment and evaluation of the Design Program, which is carried out together with the Client's team, enables the calculation of the time required for the definitive and executive design phases.

Depending on the information which is progressively produced by the planning team, the Consultant can develop and study construction methods which are suitable for other members of the Project, as well as drafting estimates of costs, and planning the construction stages properly. The result is a Design Program which is up to date with the targets and a shared system which enables progress to be assessed. Confirming the Customer's preliminary plan, recommending useful changes to optimize times and costs and carrying out Value Engineering in a timely manner are easily enabled.

- **Project Organization, Communication and Documentation at Design Stage**

The Project in question is characterized by the need to punctually determine the overall needs of the Customer so that they can be provided with the project documentation drafted by the Consulting Team. In order to identify the individuals delegated to represent the parties so that they can discuss their roles and responsibilities, the PM provides a useful tool for the control, organization and subdivision of the duties to be carried out; a Responsibility Matrix. The Responsibility Matrix interfaces with the Design program including approvals and/or activities which are the responsibility of individuals involved in the development of the Project. Activities such as “document drafting", "reviewing" and "approvals" which are included in the Responsibility Matrix are determined by the access hierarchies and the use of the IT Platform previously introduced, the PM Workspace. It provides the Project Team with clear responsibility guidelines disciplining the production of information and documentation.

- **Design Coordination Periodic Meetings**

The Consultant will draft a program of meetings for the co- ordination and progress of the project on at least a fortnightly basis and prepare and distribute an agenda of the most important topics to discuss. The co-ordination meetings are chaired by the Design Manager. During these meetings, possible non-conformities which could, if identified at the end of the planning development, cause delays to the project will be identified in advance. Periodic meetings constitute a collaborative and transparent approach to planning with frequent opportunities for interdisciplinary assessments. The meetings for planning co-ordination provide the possibility of foreseeing opportunities, identifying problems and finding solutions at an early and timely stage. This enables the precise monitoring of various events, dates and responsibilities.

- **In-progress Design Control**

Design verification is an activity which is unique in that it enables the integration of the pertinent assessments by the Client with those of the Design Management department of the PM. This specific activity, during the completion of the different stages of planning (Preliminary Design and Final Design), focuses on aspects such as:

- Verifying that the benchmark technical rules are being currently applied in the drafting of the project;
- Verifying that the specific regulations regarding the methodologies adopted by the designers are being properly implemented;
- Verifying that the hypothetical designs proposed are coherent with the calculations regarding their technical, environmental, architectural, structural, installation and safety properties.

✓ *Thoroughness and suitability:*

- Verification of documentation: checking the existence of all the documents to be examined that are required by the project;
- Verification of whether the calculations used in the drafting up of the project are exhaustive on the basis of the project requirements;
- Verification of whether the information contained in reports is exhaustive;
- Verification of whether the modifications to the project following previous assessments are exhaustive;
- Verification that the commitments provided in the regulations disciplining the awarding of the design tender are being fulfilled.

✓ *Clarity, legibility and cross-checking:*

- Verifying the legibility of the documentation as regards the proper use of conventional language in such documentation;
- Verifying the clarity of the information contained in the documentation and the ease of cross-checking the calculations;
- Verifying the coherence between the information in different documents.

✓ *Conformity:*

- Whether the solutions contained in the plan comply with the requirements expressed in the brief documents or in the planning reports produced in the previous phase;
- Whether the design solutions conform to the applicable benchmark regulations.

▪ **Design Compatibility with Construction Methodologies**

The Consultant will work in collaboration with the Client in order to verify whether the technical choices for the project are coherent with the decisions made for the realization, delivery and use of the real estate property in question, with specific focus on:

- The method of implementation;
- The sequence of the main construction stages;
- Access and exits;

Articles and systems for the long-term supply of goods which could cause delay in the construction plans (long-lead items):

- Specific market conditions, availability of materials and company workloads; Prefabrication, special items;
- Commercial sub-division of the main supplies and subcontracts;
- Safety;
- Lifting loads;
- Storage of material, logistics;
- Environmental compatibility

In carrying out these assessments during the course of the works, and with specific focus on matters such as safety and the environment, the Consultant will use the consolidated ROAD (Risks and Opportunities at Design) procedure.

▪ **Design Progress Report**

The report is drafted on a monthly basis, together with the planning team. It should reflect the project requirements and particularly the documentation used in the contract tender and take into account the subjects and the assessments to be carried out during the Validation phases. The report, which includes tables of the ROAD assessment, is issued after the above-mentioned Periodical Project Co-ordination Meetings. The progress report for the planning includes the following items:

- Completeness of the designs and percentage of works completed in relation to the General Plan of the Intervention and, in particular, procurement activities;
- Adequate use of the measures aimed at environmental protection on the work-site and during the completion phase;
- Minimizing the risk of making changes and causing disputes;
- The presuppositions for the durable quality of the construction work;
- The consistency of all aspects of the economic situation and any possible intervention regarding Value Engineering in relation to the different types of works stipulated in the budget;
- Whether the chosen design solution is relevant to the tender.

5.5.4 Tender Management

All necessary documents (technical specifications, bills of quantities, final designs, system/detailed drawings and etc.) constituting the tender documents related with the construction contracts in accordance with the World Bank Guidelines and Standard bidding documents will be prepared in parallel to the Preliminary Design Stage and Final Design and System/Detailed Drawings Stage stipulated above. The Consultants will prepare the documents in close cooperation with the Client and make all the documents ready for tendering. The documents will be prepared with due care and diligence so that any of the items must not contradict to each other, and the World Bank procurement rules and all material specifications shall be in accordance with the specifications of the first class materials satisfying the Bangladesh standards and applicable EU Legislation, if not international standards.

The Consultant will submit its construction and other cost estimates for various project parts together with any report or other documents that it will be submitted during the performance of the services and tasks envisaged within the scope of this work. The cost estimates will be as detailed as necessary and shall be submitted together with the data, which will constitute basis for controlling the presented values when required. A complete description of the works required for the execution of the contract, coordinated and completed in all respects will be produced. The contractual documentation for the tender will provide the Client with a clear overview and a transparent procedure for selecting and awarding the appropriate offer and minimizing the risk of legal disputes during the tender and reservation by Contractors during the executive phase of the contract.

The Client shall be assisted during the tender stage, such as issue of Addendum (if any needed) in the evaluation of bids particularly with detailed analysis and recommendations in respect of the received proposals by the Consultant. The Consultant will manage the tender stage on behalf of the Client through the analysis and tabulation of offers, providing advice for the assignment of the works.

6. Project Schedule / Work Plan

6.1. The Basis for an Efficient and Feasible Work Plan

The Work Plan elaborated for this venture derives from a detailed analysis of Term of Reference and objectives given in tender documents aiming to guarantee the best services for the Client.
The Term of Reference has been analyzed, studied and shared by the writer and, through the Work Plan, the intention is to translate its contents at various stages in a practical manner. Through the work Plan the Consultant identify the key activities, the interconnections among them, timing and deadlines. To describe the prepared Work Plan better and in a consistent manner with what is stated in the tender documents, the date of commencement of works 1st May 2018 was taken as reference. It is thus of clear understanding that should the activities start after the date above mentioned, the entire program schedule would be moved forward.

6.2. General

The activities relate to the different steps of all 3 stages of the project and assistance during the process to RAJUK is identified in the following work plan provided. The stage-1 activities will have a duration of 8 months (240 calendar days from the Contract signing date). The Stage-II will be executed within 25 months (750 calendar days) from the Contract signing date. Even before the start of the Stage-I activities, the proponent will define the professionals of work group (Key Activity No 1), functions, tasks, timing and objectives. The Consultants then will set up logistically in the local branch office at the Sheltech Dhaka. In any case, during the design activities, the Consultant, if necessary, will have the possibility to be supported by the Back Office of foreign-local team dealing about technical, administrative and legal matters.
To manage the commissioned work in support of the entire design phase the Consultant will furnish the Client with their technology platform, called the PM Workspace (Key Activity No 3). This is usually employed in projects of great prominence and importance so as to facilitate and simplify communications along with data exchange between the parties involved.
For the duration of the activities, the Consultant will be prepared to participate at all the meetings that the Client will call for. During the meetings the Client will verify the status of activities planned and will share the design inputs and focus on set objectives. In this regard, the Consultant will ensure the presence of the Project Manager as a professional interface and all other technical and/or administrative personnel whose presence will be useful at the meetings. This is subject to Client's authorization. The Consultant will take all logistic steps to be able to hold the meetings at Istanbul office or to be present at anytime and anywhere the Client requests. In any event, there will be a maximum guarantee of availability for other meetings' attendance by third parties in accordance with the needs of the Client.
For this project, the Consultant will implement Project and Construction Management type of approach that is based on a well-structured, well-organized work, planning activities and process controls in place. This will be formed upon the drafting of the General Plan of Interventions (Key Activity No 4) which will define the technical and administrative procedures for various activities of the professionals involved. To ensure the functional elements of the project and its success, the General Plan of Interventions will be continually updated and integrated in full agreement with the Client. The General Plan of Interventions will be developed in accordance with the Quality Plan prepared specifically for this project (Key Activity No 5) with the aim to apply the Quality Assurance System (UNI EN ISO 9001) procedures and the Environmental Quality System (UNI EN ISO 14001) used by Protek and NKY Architects.
The Quality Plan will define the governing rules of the project which will be prepared at the beginning of the activities. It will be also updated based on the requirements that might occur from time to time, prior approved

by the Client. Among other matters, the rules for the design team training will also be defined as they will form a part of the Quality Plan. It will help the team to have always abundantly clear final objectives, the time schedule of the design and baseline data.
Throughout the design phase regular monthly reports will be issued (Key Activity No 6). These will comprise the Design Program so as to update the Client on the progress of the various design activities.

6.3. Key Activities

The identified Key Activities are:

Stage 1: Project Organization, Data Collection, and Situation Analysis	#
Deliverable 1 – Inception Report including stakeholders analysis and Consultations Participatory Plan	D-1
Deliverable 2 – Interim Report including Records of Consultations	D-2
Deliverables 3 and 4 – Draft Final, Consultations Report; and Final Report	D-3
1- Preparation of the ToRs and evaluation criteria regarding forming the POC.	D-4
2- Evaluation of the experts and result based matrix	D-5
3- Report on the outcomes of the kick off meeting	D-6
4- Final inception report on way forward and Project organization	D-7
Report on past studies reflecting the documentation process and methods	D-8
Report identifying the potential gaps in data.	D-9
Report on demographic and socio-economic data characteristics and incorporate into the Planning Knowledge Base	D-10
Mapping the initiatives related to risk sensitive urban planning and governance sector;	D-11
Report on outcomes of the consultation and organograms related to key stakeholders to be engaged in the process.	D-12
Develop a report on the overall characteristics of the governance and policies including the influence on shortcomings	D-13
Document urban patterns of development, physical and environmental conditions, conflicts in land uses, zoning violations, and other relevant planning information	D-14
Conduct workshops and sharing knowledge activities with relevant stakeholders	D-15
Situation report on the existing planning system, its legislative foundation, process, approach, practice, evolution, implementation, enforcement and outputs and identifying gaps	D-16
Data Collection report on mapping systems in particular maps representing geologic hazards, climate and metrological hazards, soil and geotechnical, natural drainage, elevation, and other	D-17
Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.	D-18

Stage 2: Development of the internal guidelines and processes for RSLUP to upgrade reform the current planning system	#
Prepare "Preliminary Assessment Report" setting forth the results of the assessment conducted and results achieved.	D-19
Develop a strategic framework based on the results achieved and way forward planning to overcome the shortcomings and how to overcome the possible consequences and risks associated with each critical component identified in the scope of the work	D-20
Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas	D-21
Conduct detailed geotechnical and geophysical studies of all DMDP area of Dhaka City which information is available in RAJUK website(www.rajukdhaka.gov.bd) for the purpose of microzonation. The proposed scale for geotechnical data collection for the microzonation	D-22
Conduct detailed Geotechnical Study (including all field and all laboratory tests) by means of Standard Penetration Tests (SPT) (rotary drill with hydraulic arrangement) with Standard Automatic Hammer (ASTM D-1586-84, Hammer: 63.5 kg + 1 kg; Height of fall: 760 mm + 25 mm, collecting and necessary testing of samples in numbers as required (preferably at the interval of 1500 mm) for stratification of layers, physical parameters of soils like Atterberg limits, Specific gravity, Grain size distribution (by weight sieve, Hydrometer), shrinkage & swelling, consolidation; Shear Test, Triaxial Shear Test, Unconfined compression test, and entering all these information in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 15,000 meters will be conducted	D-23
Conduct detailed geotechnical study by means of Cone Penetration Tests (CPT), performing all necessary tests including cohesion, angle of internal friction, pore water pressure, permeability test etc., collecting all necessary data and information and them in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 5,000	D-24
At the same bore hole location obtain shear wave velocity profile from the indirect tests such as MASW, SASW, seismic refraction, reflection etc. so that the test results from the direct and indirect geophysical tests can be compared at the selective grid points.	D-25
Prepare a comprehensive report on the outcomes of the geotechnical and geological studies reflecting the results and way forward recommendations.	D-26
Propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning.	D-27
Develop a plan for urban expansion and commensurate land servicing with adequate infrastructure;	D-28
Deploy the conditions for the provision of adequate, affordable housing as an alternative to integrated, locally managed urban development and housing programmes with national support mechanisms.	D-29
Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the Draft Dhaka Regional and Urban Resilience Strategy.	D-30
Complete and submit the Greater Dhaka Risk Sensitive Land Use Strategy	D-31

Stage 3: Training and Capacity Building for risk-sensitive planning	#
Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans	D-32
Report for Proceedings and outcomes of the awareness campaigns and trainings	D-33
Develop a Guideline on Monitoring and Evaluation focusing on tool development	D-34
Prepare Action-oriented guidelines and tools focusing on priority areas such as risk sensitive urban planning, design, infrastructure, housing, employment generation, governance and finance	D-35
Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the RSLUP training.	D-36
Complete a RSLUP Guidebook as an update to the RSLUP Guidebook produced by Bangladesh Earthquake Urban Resilience Project	D-37
Final Consultancy Report addressing full documentation	D-38

6.4. Documents and Reports

Submission of reports shall be as follows:
Format of Reports: A4 or A3, including where appropriate drawings reduced to A3 size.
Format of Drawings: A1 and/or A0 size.

A draft copy (TEnglish 2) of all reports shall be submitted to the Client in advance for discussion purposes following which the Consultants shall be required to prepare the final copy, incorporating any amendments arising from such discussions.
Original of the drawings that shall be submitted to the Client are not included in the above number of copies.

6.5. Workplan

The duration of 36 months is sufficient enough to carry out all the activities within the responsibility of our JV in accordance with ToR requirements and our methodologies.
However, during the kick off meetings and bilateral meetings with PIU a specific request was made if a fast track of the activities would be possible.
Our teams have extensively studied the workplan and deliverables and have reached to following conclusion:

1- The duration of the 36 months can be reduced to 30 months- the quality of the outputs and achievements will remain the same- with the understanding and acceptance of following terms:

a. The data required which has been stated in Chapter 3 of this report shall be immediately provided.
b. The duration for the approval of the reports from the PIU/WB shall be limited to 10days.
c. The additional staff/individual consultants/sub-contractors may require, and the consultant will provide as required. No extra charge for these consultants will be requested however the expectation from PIU is to facilitate their utmost assistance to timely provide the payments in accordance with the revised workplan stated herein.
d. Facilitation from PIU for getting necessary approval. Especially providing necessary permissions have crucial importance.
e. With the workplan provided we have aimed to have a deliverable/financial progress of at least 40% by July 2019 and 75% by July 2020 while we have aimed to complete project by June 2021.

2- The duration of the 36 months cannot be reduced to 18 months with the understanding of following terms:

- The current practice has shown that the duration for the approval of the reports is too long from PIU side which will have negative effect in the implementation
- Acceleration of the Work plan will require immense financial resources which is impossible with the current cash flow available
- Additional staff will be required which mobilizing them in Dhaka brings additional management barriers such as visa, accommodation, office etc.
- It is obvious that Microzonation Studies can not be completed prior conducting Geotechnical and Geophysical Studies completely and given the fact that meteorological barriers may not allow us to complete the these studies anytime sooner than April 2020.
- Based on Critical Path Method (CPM) there are too many activities which related to each other and must set as Finish-Start tasks.
- There are too many parallel activities which are in CPM and monitoring of them is impossible.
- Weather and environmental aspects in the WBS may negatively affect all activities.
- There are too many lag, lean and floating time for extending duration beyond 18 months.

With all above herein we regret to state that acceleration/fast tracing of the currently designed 36 months project into 18 months is not possible. However our teams will make sure that they use their utmost efforts to complete the works in due course as per your request.

6.5.1 Revised Workplan

"Consultancy Services for Development of Risk Sensitive Land Use Planning Practice" for Urban Resilience Unit (URU) Package No.: URP/RAJUK/S-05, IDA Credit: 55990 Form TECH-5; Timeline			Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
			To	31-Jan-19	28-Feb-19	31-Mar-19	30-Apr-19	31-May-19	30-Jun-19	31-Jul-19	31-Aug-19	30-Sep-19	31-Oct-19	30-Nov-19	31-Dec-19	31-Jan-20	29-Feb-20	31-Mar-20	30-Apr-20	31-May-20	30-Jun-20	31-Jul-20	31-Aug-20	30-Sep-20	31-Oct-20	30-Nov-20	31-Dec-20	31-Jan-21	28-Feb-21	31-Mar-21	30-Apr-21	31-May-21	30-Jun-21
			From	1-Jan-19	1-Feb-19	1-Mar-19	1-Apr-19	1-May-19	1-Jun-19	1-Jul-19	1-Aug-19	1-Sep-19	1-Oct-19	1-Nov-19	1-Dec-19	1-Jan-20	1-Feb-20	1-Mar-20	1-Apr-20	1-May-20	1-Jun-20	1-Jul-20	1-Aug-20	1-Sep-20	1-Oct-20	1-Nov-20	1-Dec-20	1-Jan-21	1-Feb-21	1-Mar-21	1-Apr-21	1-May-21	1-Jun-21
Stage 1: Project Organization, Data Collection, and Situation Analysis (Approximate duration 10 months)																																	
Tasks and Accomplishments		**List of Reports/ Documents to be submitted or approved**	**Duration**																														
Development of SEA Report for Greater Dhaka Metropolitan Development Plan	MD1	**Inception Report including stakeholders analysis and Consultations Participatory Plan**	2 Months	1	2																												
	D1	**Interim Report including Records of Consultations**		1	2																												
	MD1	**Draft Final, Consultations Report; and Final Report**		1	2																												
Project Organization	ID-1	1- Preparation of the ToRs and evaluation criteria regarding forming the POC.	3 Months	1	2	3																											
	ID-2	2- Evaluation of the experts and result based matrix		1	2	3																											
	ID-3	3- Report on the outcomes of the kick off meeting		1	2	3																											
	D2	**4- Final inception report on way forward and Project organization**		1	2	3																											
Planning Knowledge Base	ID-4	Report on past studies reflecting the documentation process and methods	4 Months	1	2	3	4																										
	ID-5	Report identifying the potential gaps in data.		1	2	3	4																										
	ID-6	Report on demographic and socio-economic data characteristics and incorporate into the Planning Knowledge Base		1	2	3	4																										
	ID-7	Mapping the initiatives related to risk sensitive urban planning and governance sector;		1	2	3	4																										
	ID-8	Report on outcomes of the consultation and organograms related to key stakeholders to be engaged in the process.		1	2	3	4																										
	ID-9	Develop a report on the overall characteristics of the governance and policies including the influence on shortcomings		1	2	3	4																										
	ID-10	Document urban patterns of development, physical and environmental conditions, conflicts in land uses, zoning violations, and other relevant planning information		1	2	3	4																										
	ID-11	Conduct workshops and sharing knowledge activities with relevant stakeholders		1	2	3	4																										
Situational Analysis and Diagnosis of the Current Planning and Development Context	MD2	**Situation report on the existing planning system, its legislative foundation, process, approach, practice, evolution, implementation, enforcement and outputs and identifying gaps**	4 months	1	2	3	4																										
	D3	**Data Collection report on mapping systems in particular maps representing geologic hazards, climate and metrological hazards, soil and geotechnical, natural drainage, elevation, and other**				1	2	3	4																									
	MD2	**Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.**				1	2	3	4																									

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				Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
				To	31-Jan-19	28-Feb-19	31-Mar-19	30-Apr-19	31-May-19	30-Jun-19	31-Jul-19	31-Aug-19	30-Sep-19	31-Oct-19	30-Nov-19	31-Dec-19	31-Jan-20	29-Feb-20	31-Mar-20	30-Apr-20	31-May-20	30-Jun-20	31-Jul-20	31-Aug-20	30-Sep-20	31-Oct-20	30-Nov-20	31-Dec-20	31-Jan-21	28-Feb-21	31-Mar-21	30-Apr-21	31-May-21	30-Jun-21
				From	1-Jan-19	1-Feb-19	1-Mar-19	1-Apr-19	1-May-19	1-Jun-19	1-Jul-19	1-Aug-19	1-Sep-19	1-Oct-19	1-Nov-19	1-Dec-19	1-Jan-20	1-Feb-20	1-Mar-20	1-Apr-20	1-May-20	1-Jun-20	1-Jul-20	1-Aug-20	1-Sep-20	1-Oct-20	1-Nov-20	1-Dec-20	1-Jan-21	1-Feb-21	1-Mar-21	1-Apr-21	1-May-21	1-Jun-21
Stage 2: Development of the internal guidelines and processes for RSLUP to upgrade reform the current planning system (Approx. Duration 17 months)																																		
Tasks and Accomplishments		**List of Reports/ Documents to be submitted or approved**	**Duration**																															
	MD3	Submit Geotechnical and Geological Survey plan. Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas				1	2	3	4																									
Conduct a comprehensive study to assess implications of hazards, vulnerabilities and risks on the current regional boundary. In particular, assess how hazards, vulnerabilities and risks were considered in the following contexts:	MD3	1. Prepare "Preliminary Assessment Report" setting forth the results of the assessment conducted and results achieved.	4 months				1	2	3	4																								
	MD3	2. Develop a strategic framework based on the results achieved and way forward planning to overcome the shortcomings and how to overcome the possible consequences and risks associated with each critical component identified in the scope of the work				1	2	3	4																									
Conduct a comprehensive study on a city wide geotechnical investigation for the purposes stated above in the scope of work.	GD1	1. Conduct detailed geotechnical and geophysical studies of all DMDP area of Dhaka City which information is available in RAJUK website(www.rajukdhaka.gov.bd) for the purpose of	15 Months				1	2	3	4																								
	GD2	2. Conduct detailed Geotechnical Study (including all field and all laboratory tests) by means of Standard Penetration Tests (SPT) (rotary drill with hydraulic arrangement) with Standard Automatic Hammer (ASTM D-1586-84, Hammer: 63.5 kg + 1 kg; Height of fall: 760 mm + 25 mm, collecting and necessary testing of samples in numbers as required (preferably at the interval of 1500 mm) for stratification of layers, physical parameters of soils like Atterberg limits, Specific gravity, Grain size distribution (by weight sieve, Hydrometer), shrinkage & swelling, consolidation; Shear Test, Triaxial Shear Test, Unconfined compression test, and entering all these information in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 15,000 meters				1	2	3	4						5	6	7	8	9	10	11													
	GD3	3. Conduct detailed Geotechnical Study by means of Cone Penetration Tests (CPT), performing all necessary tests including cohesion, angle of internal friction, pore water pressure, permeability test etc., collecting all necessary data and information and them in necessary tables, graphs etc. furnishing them in the form of standard sub-soil investigation report duly signed by competent geotechnical Engineer. (at a minimum, a total length of 5,000 meters will be conducted)				1	2	3	4						5	6	7	8	9	10	11													
	GD4	4. At the same bore hole location obtain shear wave velocity profile from the indirect tests such as MASW, SASW, seismic refraction, reflection etc. so that the test results from the direct and indirect geophysical tests can be compared at the selective grid points.						1	2	3	4										15													
	MD4	5. Draft analysis report of the geotechnical and geological studies conducted with Recommendations as well as Prepare a final comprehensive report on the outcomes of the geotechnical and geological studies reflecting the results and way forward recommendations. This will include the compilation of the Seismic and Hazard Mappings and risk profiles for the greater Dhaka City					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15													
	MD4	3. Submit Geotechnical and Geological Survey plan. Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas	6 Months																	1	2	3	4	5	6									
Based on the findings, propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning. The framework should address the following:	D4	Propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning.	6 Months																	1	2	3	4	5	6									
Develop a Draft Greater Dhaka Risk Sensitive Land Use Strategy with a vision statement, specific objectives and goals, elaboration of the outputs and outcomes, constraints and resources, risk factors, safeguards, and monitoring and evaluation indicators. The Strategy should be aimed at institutionalizing the proposed mainstreaming framework.	D5	1- Develop a plan for urban expansion and commensurate land servicing with adequate infrastructure;	6 months																	1	2	3	4	5	6									
	D6	2- Deploy the conditions for the provision of adequate, affordable housing as an alternative to integrated, locally managed urban development and housing programmes with national support mechanisms.																		1	2	3	4	5	6									
	D7	3- Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the Draft Dhaka Regional and Urban Resilience Strategy.																		1	2	3	4	5	6									
	MD4	4- Complete and submit the Greater Dhaka Risk Sensitive Land Use Strategy																		1	2	3	4	5	6									

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Form TECH-5; Timeline

			Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
			To	31-Jan-19	28-Feb-19	31-Mar-19	30-Apr-19	31-May-19	30-Jun-19	31-Jul-19	31-Aug-19	30-Sep-19	31-Oct-19	30-Nov-19	31-Dec-19	31-Jan-20	29-Feb-20	31-Mar-20	30-Apr-20	31-May-20	30-Jun-20	31-Jul-20	31-Aug-20	30-Sep-20	31-Oct-20	30-Nov-20	31-Dec-20	31-Jan-21	28-Feb-21	31-Mar-21	30-Apr-21	31-May-21	30-Jun-21
			From	1-Jan-19	1-Feb-19	1-Mar-19	1-Apr-19	1-May-19	1-Jun-19	1-Jul-19	1-Aug-19	1-Sep-19	1-Oct-19	1-Nov-19	1-Dec-19	1-Jan-20	1-Feb-20	1-Mar-20	1-Apr-20	1-May-20	1-Jun-20	1-Jul-20	1-Aug-20	1-Sep-20	1-Oct-20	1-Nov-20	1-Dec-20	1-Jan-21	1-Feb-21	1-Mar-21	1-Apr-21	1-May-21	1-Jun-21
Stage 3: Training and Capacity Building for risk-sensitive planning (Approx. duration 9 months)																																	
Tasks and Accomplishments		**List of Reports/ Documents to be submitted or approved**	**Duration**																														
Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans	**D8**	**1. Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans**	2 months																							1	2						
	ID-12	2. Report for Proceedings and outcomes of the awareness campaigns and trainings																								1	2						
	ID-13	3. Develop a Guideline on Monitoring and Evaluation focusing on tool development																								1	2						
Elaboration and test of operational recommendations	**D9**	**Prepare Action-oriented guidelines and tools focusing on priority areas such as risk sensitive urban planning, design, infrastructure, housing, employment generation, governance and finance**	2 Month																									1	2				
Mobilize the resources for RSLUP training and conducting training of trainers (ToT) activities	ID-14	1. Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the RSLUP training.	3 Months																											1	2	3	
	D10	**2. Complete a RSLUP Guidebook as an update to the RSLUP Guidebook produced by Bangladesh Earthquake Urban Resilience Project**																												1	2	3	
Full documentation and preparation of reports and deliverables.	**MD5**	**1. Final Consultancy Report addressing full documentation**	1 Month																														1

NOTE:	ID	Interim Deliverable: The reports and outcomes will not be shared with PIU
	D	**Deliverable: The deliverable will be shared with PIU for verification and information only**
	GD	**Geotechnical Deliverable: This deliverable is based on the outcome of the geotechnical studies conducted for the purposes of Microzonation. A separate Workplan for the delivery of the Geotechnical studies will be provided with Inception Report. The reports and deliverables will be submitted to PIU for Approval and Payment purposes**
	MD	**Main Deliverable: The reports and deliverables will be submitted to PIU for Approval and Payment purposes**

Annex A. Terms of Reference

TERM OF REFERENCES
For Development of Risk Sensitive Land Use Planning practice
Component B2– *sub-components B2a, B2b, B2c, B2d*

1. Context

In recent years, Bangladesh has reformed its approach to cyclone and flood risk management and preparedness. Triggered by major loss of life and assets, notably during the cyclones of 1970 and 1991 that killed over 300,000 and 140,000 people respectively, the Government of Bangladesh (GoB), civil society, and international development partners have demonstrated that investment in the systems and structures of flood risk management and cyclone preparedness saves lives, reduces economic loss, and protects development gains. As such, Bangladesh is cited often in the rationale for investment in disaster risk management (DRM) activities globally.

The threat of an earthquake, however, is less visible but significant given that Bangladesh lies on the seismically active Indian plate. Inertia has slowed earthquake awareness because these events occur less regularly and are currently relatively absent from the living memory of the country's inhabitants and leaders. Studies by the Geological Survey of Bangladesh divide the country into three seismic zones, which show that earthquake risk is medium to high throughout the country and increases towards the north and east of the country. Although there is some uncertainty, research suggests that an earthquake of up to magnitude 7.5 is possible, and the nearest fault line runs just 60km from the nation's capital.

A National Plan on Disaster Management (2010-2015) includes an Earthquake Management Plan and a National Earthquake Contingency Plan, which have been developed under the Ministry of Food and Disaster Management. These plans identify response and risk reduction activities with corresponding lead and support agencies. However, the plans lack the comprehensive vision of a national earthquake strategy, and a convincing demonstration of benefits, implementation, and controls. Furthermore, the institutional structure for multi-stakeholder engagement to deal with a problem as complex as urban earthquake risk is also lacking and the existing plans do not engage agencies and organizations in a sustainable way.

To respond to this critical gap in the management of disaster risk in Bangladesh, this project represents the second phase of a multi-phase national DRM program to build institutional capacity to mitigate the impact of earthquakes, cyclone and floods in the rapidly urbanizing cities of Bangladesh. The objective of the overall engagement is to develop a comprehensive approach to managing disaster risk through a structured process of knowledge development, education, and planning that involves a wide range of stakeholders to increase engagement and ownership to reach building inclusive, resilient, sustainable and prosperous urban communities. Government planners and private professionals need to be trained on risk-sensitive land use planning (RSLUP). At the same time, the land use planning system needs to be updated to become risk sensitive. This translates into a new framework for a national integrated plan that includes:

1. Risk-sensitive land use planning from their formulation, implementation and enforcement perspective;
2. Mainstreaming risk management and reduction parameters and objectives in land use plans from their formulation to their implementation and enforcement;
3. Identifying and quantifying natural hazards (e.g., flood, earthquake, extreme winds, etc.) and related risk parameters in the planning methodology;
4. Formulate a vision for a disaster resilient city and develop a risk profile and disaster risk reduction objectives;
5. Reaching consensus with stakeholders on planning criteria and zoning requirements derived from the RSLUP process; and
6. Embarked on efforts to prepare and enforce risk sensitive land use plans in Bangladesh to reach a planning that integrates risk reduction, to allow communities to find the right mix of both development and risk reduction,

2. Background

Bangladesh Urban Earthquake Resilience Project (UERP) evaluated the existing planning policies, systems and plans under RAJUK. It provided input and detailed guidance on how future plans can be made "risk-sensitive" and how mainstreaming can be incorporated in the land use management approaches and various sectors of development embedded in the plan. The findings and

guidelines were summarized in the Guidebook for Risk-Sensitive Land Use Planning of Dhaka[5] produced as an output of Bangladesh UERP. An introductory training on risk-sensitive land use planning was developed and completed for about 35 planners and engineers as explained in the RSLUP Guidebook.

At the same time, significant hazard, vulnerability and risk assessment data and output has been produced by the Comprehensive Disaster Management Program (CDMP)[6] and the Bangladesh UERP. A Dhaka City Profile and Earthquake Risk Atlas publication was produced by Bangladesh UERP Phase 1 and has been widely distributed among government agencies and other stakeholders in Dhaka.

The data, information and technologies provide the relevant environment to inform the planning system and plans of Dhaka and make them risk-sensitive. Sharing data and creating open systems promotes transparency, accountability, and ensures a wide range of concerned stakeholders are able to participate in the challenge of building resilience. The Bangladesh Geospatial Open Data Sharing Platform (GEODASH) is being developed under a separate World Bank contract to facilitate knowledge and data sharing and provide better information tools to support disaster risk management planning and decision making. RAJUK is expected to be an active participant in the development and sharing of data within GEODASH. Additional GIS resources are provided to enable RAJUK to play a key role in this initiative.

RAJUK is completing the Dhaka Structure Plan (2016-2035) and the Dhaka Regional Development Plan (RDP). These plans provide the policy, strategies and pattern of development in the Metropolitan Dhaka for the next 20 years. Risk-sensitivity in the plans is only integrated in terms of hazards such as geological and meteorological attributes. Suitability of land and infrastructure qualities criteria are also included. The geological input is provided by the Geological Survey of Bangladesh during the planning process. The input is limited to hazards and does not include a full integration of the earthquake risk considerations, as well as, disaster risk management and disaster risk reduction objectives (e.g., considerations for open space for immediate response staging, access of emergency vehicles, considerations for survivors' shelter, and considerations for debris removal and dumping). Policies and mechanism for mainstreaming risk reduction and disaster management objectives are not explicitly derived and integrated in the plans. Hence, the opportunity to mainstream DRM at the strategic level may not be fully realized.

An opportunity to fundamentally influence future development, reduce risk and build resilience is present in the development of the detailed area plans (DAPs). The plan development is scheduled for 2015. The objective is to make the DAP risk-sensitive and to support integration and mainstreaming of HVRA (to include hazards such as earthquake and flood and related risks for Greater Dhaka) in the planning process.

3. Scope of Work

The objective is to review, enrich and strengthen the current planning regulation, process, and methods of RAJUK, to ensure that DAP (2016-2035) and DAPs are risk-sensitive and to improve ownership for consultation, learning and consensus building within RAJUK and other agencies involved in the land-use planning process of Dhaka (e.g., DCCs, DWASA, TITAS GAS, and others).

In prior to any activities to be carried out regarding RSLUP the engagement shall include updating of the existing Strategic Environmental Assessment (SEA) for Greater Dhaka Metropolitan Development Plan aiming at integration of environmental considerations into the preparation and adoption of plans and programs with a view on promoting sustainable development goals. This to be achieved by ensuring that an environmental assessment is carried out of certain plans and programs which are likely to have significant effects on the environment.

Risk sensitive land-use management is complex by its nature and involves legal, technical, and social dimensions. The legal and regulatory dimension includes laws, decrees, ordinances and other regulations adopted by national and local governments. The technical and instrumental dimension includes planning tools and instruments that regulate uses of land and strive for the best balance between private interests and the public good. The social and institutional dimension includes those mechanisms, which include citizen participation in land-use management practices, such as consultations, public hearings, open municipal sessions and plebiscites. The consultant shall consider these entire dimensions during conducting situation analysis and diagnosis.

The engagement shall design and propose a land use planning investigation process and procedures that shifts towards risk-sensitive planning, investment programming and implementation. This requires designing procedures, indicators and criteria on how to assess and improve current town- planning structures, practice and processes. The engagement shall look into the planning process and identify key entry points of DRM mainstreaming in the plan formulation, in investment programming and implementation.

The engagement includes developing and training RAJUK's town-planning professionals and related specialists on a well-illustrated and structured step-by–step approach on how to utilize technical assessments, interpret results and integrate disaster risk reduction parameters and objectives into Metro-Dhaka City's land use plans, Detailed Area Plans, Zoning Provisions and the decision making processes involved in the development and implementation of land use and construction control regulation.

The engagement should review relevant past studies in Bangladesh (e.g., CDMP and Bangladesh URP), develop an understanding of the hazard and risk profiles for Greater Dhaka, acquire an in-depth understanding of the current planning systems and plans and frame them into the global experience to develop an overall strategy and approach for the project.

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[5] Bangladesh Urban Earthquake Reduction Project, Risk Sensitive Land Use Planning Guidebook. World Bank, February 2014. (A copy can be obtained by request to info@emi-megacities.org).

[6] The Comprehensive Disaster Management Program (CDMP) is a program of the Bangladesh Ministry of Disaster Management and Relief (MoDMR) and the United Nations Development Programme (UNDP).

A structured participatory process of all relevant stakeholders, under the leadership of RAJUK's Town Planning Department, shall be put in place supported by experts in urban DRM mainstreaming as well as in relevant sectors of planning (e.g., housing, transport, infrastructure, social and economic). The participatory process is used as a mechanism to improve knowledge and understanding of the disaster risks among the stakeholders, formulate the relevant guidelines of risk-sensitive land use planning in Dhaka, validate various risk-sensitive land use designs, and facilitate consensus on major land use management principles and trade-offs among the relevant stakeholders. It is emphasized that the methodology will be on institution based planning rather than consultant driven planning.

The engagement shall include various analytical research and methods as well as data collection and validation tools such as surveys, workshops, face-to-face interviews of key informants, SWOC (Strength-Weaknesses-Opportunities-Challenges) exercises, targeted scientific seminars, and cross-referencing with global sound practices and experiences. The Consultants should be aware that learning methodologies, structured guidance, and careful analysis and planning will be required to change long established methods, principles, and processes of planning, resolve land use and zoning related conflict, and address as critical weaknesses in capacity. Hence, the expected approach should be grounded on new scientific developments in the fields of risk sensitive land use planning, risk assessment, urban disaster risk management, urban resilience and emergency management and global experience and applications in urban development processes.

Due to inadequate information about possible damages from ground shaking and liquefaction-prone areas, many builders located their structures without the benefit of thorough geotechnical investigations thereby exposing dwellers to risks. At present there are many buildings with compromised structural quality due to this lack of information and lesser concern about the soundness of their houses/structures against the risks from natural hazards inherent to the place.

In that sense the consultant will conduct a city wide geotechnical and geological studies along with microzonation studies at least the following purposes:

a) Soil properties for infrastructure: Designs for such infrastructure as roads, water and sewer, and land drainage systems are greatly affected by soil conditions from material selection to construction methods (and ultimately, cost). The information collected will be useful in selecting appropriate materials for underground pipes, determining the strength of in-situ soils for road structure designs, anticipating how soil chemistry and other properties could affect the life-cycle of materials and infrastructure, for instance.
b) Foundation designs for structures: In depth geotechnical investigations are generally not practical for foundation designs for a single residential structure, for instance; however, in the absence of such information it is possible that foundations are broadly over designed based on assumptions about soil properties. Such over design can be costly to the building community, affectively overall affordability, especially in light of the fact that soil properties vary throughout the City/
c) Groundwater patterns and levels. The effect of groundwater on the life expectancy of water, sewer, drainage, and road infrastructure is well understood. Inflow and infiltration (I/I) of groundwater into the City's sewerage system through cracks in pipes, and also through weeping tile/sump drain connections is a difficult problem to address in existing infrastructure. Groundwater characteristics in undeveloped areas of the City will be useful in determining the types of materials to use in new sewer construction, and also on measures that the City could take to reduce the risk of inflow and infiltration; in existing areas of the City it will be useful to determine groundwater patterns in order to prioritize I/I reduction efforts.
d) Asset Management. The City is undertaking the development of an asset management system that includes the geotechnical characteristics as a factor in the determination of the operation and maintenance, risk, preventative improvements, and other factors related to the cost effective and optimal management of our infrastructure
e) Environmental protection. The City has important natural features and geotechnical characteristics of such features are important for determining measures to protect them from development, and to protect development from these features as the case may be.
f) Any other required to carry out microzonation studies.

The success of the project will hinge on two important conditions: 1) The coherency, strength and experience of the Consultant's team; and 2) its ability to work closely with RAJUK and other concerned stakeholders in enabling change in the current planning system in an effective and tangible manner.

In particular the Consulting Firm should refer to *Risk-sensitive Land Use Planning Guidebook, Bangladesh Earthquake Resilience Project, World Bank, February 2014* for guidance and description of the concepts, tools and practice on risk-sensitive land use planning (RSLUP) related to Dhaka: 1) Mainstreaming DRM and RSLUP concepts; 2) RSLUP Framework and Process; 3) Methodology for analyzing the risk-sensitivity of a land use plan , 4) Conducting risk-sensitive land use planning investigations; and 5) Dhaka City case results. A relevant reference lists of past studies, data resources, and urban vulnerability context will be provided.

4. Tasks, Outputs and Deliverables

The ultimate goal of this engagement is a shift towards risk-sensitive planning practice in order that development gains and future investments are protected and risks from disasters are reduced. The strengthening of institutions through a reformed process for planning, improved technical know-how, consensus building and competent practice build a solid foundation for urban resilience in Metro-Dhaka.

To arrive at this objective, the following tasks, outputs and deliverables are envisioned to be delivered, which are broken into three

stages:

Stage 1: Carrying out/Updating a Strategic Environmental Assessment, Project Organization, Data Collection, and Situation Analysis (Approximate duration 10 months)

Four main goals to be completed and the deliverables at this stage are: 1) SEA Report and Guideline, 2) Organization of the Project; 3) Creation of Project Knowledge Base; and 4) Conduct a situation analysis and diagnosis of the urban planning and development context of Dhaka. It involves the following activities:

Development of SEA Report for Greater Dhaka Metropolitan Development Plan

- The objective of the Strategic Environmental Assessment is to incorporate environmental considerations and assess (i) the gap between the last SEA recommendation and trend of actual Dhaka Development and (ii) the likely significant environmental effects (risks and opportunities) of the implementation of the Dhaka Metropolitan Development Plan (DMDP) developed by RAJUK in the coming years.

- ***Task 1: Environmental Overview and Priorities***
  - Establish the environmental concerns and priorities of each DAPs and on the Dhaka metropolitan area as a whole drawing on existing analytical work such as the Bangladesh Country Environmental Analysis (draft September 2017) and the DAPs' environmental studies.
- ***Task 2: Stakeholder Analysis***
  - Identify the key public and private stakeholders analyzing their interests and incentives for urban development and planning. The consultant will review the role, mandate and linkages of the various institutional stakeholders, specifically the development agencies and utilities (gas, water and sewerage, electricity and telecommunications), the planning agencies (RAJUK, Union Pourashava, pourashavas around Dhaka), the municipal agencies and civil society organizations with a stake in urban development such as committees of neighbors, NGOs and CBOs, and specific focus groups (i.e. workers, commuters, children, women, etc.) that are likely to be benefited or affected by urban development.
- ***Task 3: Public Participation in the SEA process***
  - Establish a participatory plan and timeframe for the SEA process jointly with RAJUK to consult with and involve, as needed, various organizations, stakeholders and the public. In addition to determine their concerns and priorities on the environmental issues related with the implementation of the DAPs, the participatory process should contribute to institutional strengthening and improved governance for urban planning.
- ***Task 4: Assessment of Environmental Effects***
  - Assess the gap between the last SEA and the development trend of greater Dhaka.
  - Determine the likely significant environmental effects, both risks and opportunities, associated with the implementation of the DAPs, including biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, wetlands, drainage condition, landscape and its expansion and the linkages between them.
  - The consultant should also review and complement as needed in each DAP their potential environmental effects in the following priority issues, as long as they are relevant to the area under assessment:
    - Flood Control, Drainage and Sewerage
      - DND (Dhakka. Narayanganj and IIemra)
      - Kamrangir Char
      - South Block of East Dhaka
      - Narayanganj West and Tongi
      - Narayanganj East and Savar
      - North block of East Dhaka
    - Transportation Networks
      - Eastern by-pass study
      - Revitalization of water channel between Balu river and Begunbari Khal
      - Revitalization of circular water way around Dhaka (including Balu Turag, Sitalakhya and Buriganga river)
- ***Task 5: Review of Alternatives***
  - Based on the results of the assessment of potential likely significant environmental impacts and international best-practices and models for urban planning and development, the consultant will suggest from an environmental standpoint alternative implementation scenarios for the current DAPs.
- ***Task 6: Institutional, Financial, Governance and Monitoring Plan***
  - Formulate a plan for institutional strengthening, capacity building, financial and governance requirements for the implementation of the alternative selected by RAJUK following a consultation process with key stakeholders. In this plan the consultant will include the environmental monitoring measures of the DAPs in order to identify unforeseen adverse effects at an early stage, and to be able to undertake appropriate remedial action. The monitoring plan should take into account existing monitoring arrangements with a view to avoid duplications.

- ***Task 7: Dissemination***
    - Present comprehensive conclusions and recommendations to the key institutional counterparts, NGOs, academicians and community including a non-technical summary of the SEA report via workshops.

A complete ToR is enclosed is Annexure-3

Project Organization

- Organization of stakeholders to form a Project Working Group (PWG) and a Project Oversight Committee (POC).
- Organize kick-off meeting to a) Creating a cadre of professionals/scientific experts to oversee all the activities will be conducted, b) endorse the framework and implementation methodology prepared by the Consultancy Firm (The methodology and implementation framework should include i) data collection processes,ii) situation analysis, iii)past studies, iv) Needs analysis…etc)
- Develop and reach agreement on understanding of scope and deliverables, overall approach, work plan, timeline, milestones and team composition with RAJUK PIU and POC.

Planning Knowledge Base

- Collection and review of relevant past studies including CDMP and B-URP[7] and other documentation relevant to hazard, vulnerability and risk assessment, remote-sensing imagery, land use planning, land use management, development and disaster risk management.
- Review, organize, annotate and catalog the collected "exposure" data a "Planning Knowledge Base". Determine and document potential gaps in data.
- Update demographic and socio-economic data characteristics and incorporate into the Planning Knowledge Base.
- Comprehensive "mapping" of all ongoing initiatives in the risk sensitive urban planning and governance sector;
- Identification of key interlocutors at the central level, city levels
- Assess technical and administrative capacity of government institutions involved in land policy and administration to carry out their function, including assessment of their training and institutional development needs
- Co-ordinate closely with relevant agencies working on land issues, in strengthening land registration and dispute settlement in urban areas.
- Design and carry out a consultative process involving urban settlements and other key stakeholders to identify problems, constraints and effective localized approaches to and urbanization
- Review national goals and strategies for urban governance especially in light of the national plan, providing general data and information of urbanization (i.e. Population and urban population, number of cities, etc.
- Assess the overall enabling environment within which urban governance must take place (political commitment, reform required of public administration systems etc)
- Undertake targeted field visits and ground truthing to develop an understanding of the development of Dhaka and to observe and document urban patterns of development, physical and environmental conditions, conflicts in land uses, zoning violations, and other relevant planning information. Include such observations and findings in the Planning Knowledge Base.
- Select relevant data layers on planning to recommend for integration into the GEODASH[8] platform.
- Integrate of the exposure data layers of the Planning Knowledge Base into a GIS system to enable the spatial analysis of data for Dhaka
- Undertake validation workshops with PWG to confirm the validity of data. These workshops should also be opportunities for sharing of knowledge and capacity building thru the training on the Planning Knowledge Base
- Present and validate with the RAJUK PIU-PIC and the POC.

Note: *The Planning Knowledge Base should remain a living document until the end of the project where it is submitted as one of the deliverables.*

Situational Analysis and Diagnosis of the Current Planning and Development Context

- Review and document the current planning system, its legislative foundation, process, approach, practice, evolution, implementation, enforcement and outputs;

[7] Include Data Profile and Earthquake Risk Atlas, Bangladesh Urban Earthquake Resilience Project. World Bank, February 2014.

[8] The GIS databases for the built environment should be prepared in the format ready for upload into the GEODASH knowledge sharing platform.

- Review and document approach and content of the current town-plans and specific plans (regional and detailed);
- Assess gaps in planning process and identify potential shortcomings and conflicts in plan development and implementation;
- Collection and Updating of Resource Maps. These include maps representing geologic hazards, climate and metrological hazards, soil and geotechnical, natural drainage, elevation, and other.
- Validate assessment with PWG and RAJUK PIU-PIC
- Complete a Situational Analysis and Diagnosis Report summarizing approach and findings.

Note: *The project must coordinate with Component B1 concerned with the Hazard, Vulnerability and Risk Assessment of Greater Dhaka to share relevant exposure, hazard and risk data between the two projects. This particular engagement is more focused towards data related to RSLUP*.

Stage 2: Development of the internal guidelines and processes for RSLUP to upgrade reform the current planning system (Approximate Duration 17 months)

The development and implementation of the studies shall take into consideration the outputs of the studies conducted under B1 Component (Vulnerability Assessment and Prioritized Investment Plan for critical assets -Sub-components B1a, B1b, B1c). ***Under this component seismic microzonation for Dhaka city will be provided where the consultants are requested to use the outputs of these studies as benchmark while defining relevant policies related to RSLUP.***

Developing this guideline should be in close contact with RAJUK and national Authorities including Communities. In that sense prior implementing this phase a comprehensive training and sensitizing workshop series should take place.

The activities should be carried out are as following;

- Coordinate with Component B1 of the Bangladesh Urban Resilience Project to project the latest findings on risk profiles to Dhaka and to highlight the use of quantities such as Urban Resilience Indicators for Dhaka and Hotspots information indicating ward and other relevant geo-administrative units
- Conduct a comprehensive study to assess implications of hazards, vulnerabilities and risks on the current regional boundary[9]. In particular, assess how hazards, vulnerabilities and risks were considered in the following contexts:
  - The nature, scale and location of major proposed land uses including new city development, residential and industrial areas and strategic community, recreation and commercial uses;
  - The strategic transport policies and proposals;
  - The policies for flood control and drainage;
  - The policies for seismic risk reduction and vulnerability reduction
  - The policies for resilient and livable towns
  - The policies for energy conservation and green efficiency
  - The policies for Solid waste management
  - The policies for urban mobility
  - Policies for preservation of Natural Water bodies and Waterfront;
  - Policies for water supply;
  - Policies for sustainable environment;
  - Policies for disaster management;
  - Policies for historical and cultural preservation and enhancement;
  - The strategic proposals for utilities;
  - The nature, scale and location of land areas to be conserved;
  - The policies and proposals for revitalization, upgrading and environmental management in obsolescent urban areas;
  - The policies and proposals for regeneration and rehabilitation of old fabrics including slums upgrading and city extensions
  - The policies and proposals for Historical heritage conservation
  - The strategies and policies for development control;
  - The approach to density zoning (Area wise) and height zoning (Area wise)
- **Conduct a comprehensive study on a city wide geotechnical and geological investigation for the purposes of microzonation as stated above in the scope of work.**
  - Review of existing reports and records that include available geotechnical studies
  - Conduct detailed geotechnical and geophysical studies of all DMDP area of Dhaka City for the purpose of microzonation. The proposed scale for geotechnical data collection for the microzonation is as follows:

[9] Policy papers were prepared on several themes following the recently concluded Regional Development Strategy and Plan for the period up to 2035. The list of policy areas was obtained from the TORs for preparing the Regional and Local Development Strategy and Plan by RAJUK.

o Homogeneous sub-surface – 0.5 km x 0.5km to 2 km x 2km

o Heterogeneous Sub-surface – 0.1 km x 0.1 km to 0.5 km x 0.5km

- Site response analysis using equivalent linear or nonlinear analysis is to be carried using inputs obtained from geotechnical and geophysical investigations.
- A detailed liquefaction and amplification hazard analysis based on deterministic and probabilistic methods need to be carried. This level of seismic microzonation provides detailed maps of site classification, spatial variation of bedrock as well as surface amplifications, liquefaction and landslide.
- The geotechnical study shall include site and laboratory investigation to define subsurface soil profile for further static and seismic slope stability analysis (Limit State Equilibrium Analysis) and sieve analysis.
- Drill boreholes and carry out geotechnical in-situ (SPT, CPT) & geophysical direct tests (such as crosshole or seismic up, down or SCPT tests which provides direct measurement of seismic wave velocity. Plan at least one borehole at minimum for a set of nine grids (set of 3x3 grids).
- Depth of drilling ideally should go up to the bedrock level. However, the minimum recommended depth of borehole for the purpose of seismic microzonation should be between 30 – 60 m until unless bedrock is met before.
- At the same bore hole location obtain shear wave velocity profile from the indirect tests such as MASW, SASW, seismic refraction, reflection etc. (specific recommendation over these methods is made in the concluding chapter), so that the test results from the direct and indirect geophysical tests can be compared at the selective grid points.
- Microtremor studies will be conducted by means of geophone for geophysical studies.
- Site investigations should be carried out with either small track mounted or mobile auger rigs, thus limiting site disturbance and environmental impacts. In the area where the investigation is impossible alternative soil investigation methods shall be proposed (i.e. meshing, CPTs…etc)
- Prior to commencement of site investigations, the project team shall obtain from the City's representatives the underground utility locations for every property being investigated.
- Research of geological conditions by evaluation of geotechnical conditions distinctive to the site at site and by analysis and tests shall be performed in laboratories.
- **It has imperative importance to mention that the equipment, accessories and other required tools for the purpose of geotechnical and geophysical studies and microzonation should be provided by the Consultant.**

More importantly the consultant will do the capacity building for the staff of the PIU during the consultancy works and in particular provide trainings with onsite implementation of the activities. Technology transfer will as well be a part of the responsibilities of the consultancy firm.

A list of the available equipment can be found at Annexure-3.

- At a minimum following information shall be profiled for each site geotechnical studies conducted:
    - **General Geology on the basis of the investigated region**
    - **Geotechnical information for evaluation of hazards at ground surface, local site effects and liquefaction**
    - **Geological zoning of the area considering different indicators**
    - **Engineering Geology according to soil drilling performed at investigation site**
    - **Filling material and underground layers until 20 meters**
    - **Slope stability and liquefaction potential**
    - **Determination of the liquefaction potential and ground water level**
    - **Water presence**
    - **Seismic fracture measurements performed at site, Compaction wave speed of each layer**
    - **Profile resistance records**
    - **Soil bearing stress**
    - **Soil group and class and spectrum characteristic periods Ta=, Tb=.**
    - **Vertical soil reaction coefficient value Ks=Ton/m 3.**
    - **Foundation type and any other recommendations**
- Prepare City Wide Geotechnical Report compromising all the information mentioned above.

- **Use the body of existing knowledge to develop approaches to resolve apparent or foreseen conflicts (e.g. land use management, zoning in hotspot areas) and regional strategies for removing bottlenecks to risk-sensitive land use planning and implementation in Metro-Dhaka, principally in the following areas:**

- **Based on the findings, propose a comprehensive framework for mainstreaming DRR into the Dhaka planning system, detailing the methodology and parameters for risk sensitive planning. The framework should address the following:**
    - Identifying mainstreaming entry points for DRM in the Dhaka planning system (plans, process, legal and institutional and implementing tools), and related rationales;
    - Provide the analytical process to assess responsiveness of land use planning practice and its plans to DRR;
    - Relate to the findings of Stage 1 and explain linkages of relevant data to the mainstreaming methodology, in particular on interpretation of risk outputs and indicators to land use management in Dhaka
    - Provide alternative and lubricating options for keeping agricultural land as protected area, and mechanism of indicating soil bearing capacity in land plot number map.
    - Propose options for risk reduction, and financial and economic viability of selected risk reduction strategies for achieving long term urban resilience in Dhaka, including approaches for land management;
    - Propose policies specific to the needs of the urban poor, including the provision of low-income housing and upgrading informal housing areas;
    - Provide examples on improving Detailed Area Plan/Local Plan and Land Readjustment Plan for selected areas;
    - Elaborate on the implications on land management and land acquisition;
    - Define the institutional arrangements, including the organizational and regulatory frameworks required to secure development and investments in RSLUP;
    - Elaborate on the coordination mechanisms among relevant agencies and departments involved in urban development activities;
    - Define a phased implementation plan and/or priorities for these investments;
    - Complete the Mainstreaming paper considering input from stakeholders (refer to participatory process below.)
- Develop a **Draft Greater Dhaka Risk Sensitive Land Use Strategy** with a vision statement, specific objectives and goals, elaboration of the outputs and outcomes, constraints and resources, risk factors, safeguards, and monitoring and evaluation indicators. The Strategy should be aimed at institutionalizing the proposed mainstreaming framework.
    - Include benchmark criteria for RSLUP practice in Metro-Dhaka;
    - Include comparing with experiences in other countries (develop or developing countries[10]) that are relevant to Bangladesh;
- Develop outreach material composed of illustrative maps, brochures and exhibits for examples of risk-sensitive land use management approaches in Dhaka stressing the socio-economic and cultural benefits.
- Integrate the Risk Sensitive Land-use strategy into national master plan studies
- Develop a plan for urban expansion and commensurate land servicing with adequate infrastructure;
- Deploy the conditions for the provision of adequate, affordable housing as an alternative to integrated, locally managed urban development and housing programmes with national support mechanisms.
- Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the Draft Dhaka Regional and Urban Resilience Strategy.
- Complete and submit the **Greater Dhaka Risk Sensitive Land Use Strategy**

Stage 3: Training and Capacity Building for risk-sensitive planning (Approximate duration 9 months)

- Development of How-to guides with step-by-step approach and ample illustrations and examples aimed at helping/guiding planners in other cities and pourashavas to understand and strengthen the earthquake risk sensitivity of their physical development plans.
- Develop the modules, references and training programs for RSLUP in partnership with a Bangladesh academic institution offering having an Urban and Regional Planning Graduate Degree Program.
- Identify practitioners and researchers who will undertake RSLUP training, field work exercises and site-visits.
- Improve Monitoring and Evaluation focusing on tool development, internal exchanges and partner mobilization,
- Learn from other experiences associated with capacity development focusing on awareness raising and comparative evaluations,
- Elaboration and test of operational recommendations including:
    - Action-oriented guidelines and tools focusing on priority areas such as risk sensitive urban planning, design, infrastructure, housing, employment generation, governance and finance
- Mobilize the resources for RSLUP training and conducting training of trainers (ToT) activities

[10] Examples of developing countries could be Philippines and Nepal.

- Conduct of trainings (e,g, on-line, face to face) on risk-sensitive planning for Metro-Dhaka
- **Use platforms such as GEODASH and the Planning Knowledge Base developed in Stage 1 as training resources.**
- **Undertake consultation and validation process by PWG and POC and relevant scientists and experts on the RSLUP training.**
- **Complete a RSLUP Guidebook as an update to the RSLUP Guidebook produced by Bangladesh Earthquake Urban Resilience Project.**

The stages are not fully sequential. They should overlap by approximately six (6) months making a total project duration of 36 months.

Full Documentation

All electronic databases, including the Planning Knowledge Base should be on secured cloud-based portal. Soft and hard copies of technical reports, Administrator Manual and User Manual should be provided. Inception, progress and final reports should be provided for each of the three stages. Topical reports should be generated to explain methodology, provide detailed findings, and present analysis and results. Relevant input and output databases should be incorporated into GEODASH for knowledge sharing purposes among Government of Bangladesh institutions.

Participatory Process.

The Consulting Firm is expected to identify, structure, engage and remain in communication with the stakeholders through the Project Working Group (PWG) and the Project Oversight Committee (POC). Regular communication should be established with the PWG with face-to-face meetings at least once a quarter. PWG should be used as a platform for data collection, data validation, assumption confirmation, feedback, and conflict resolution and consensus development. PWG voice and input in the project should be substantive and meaningful. PWG is also the mechanism for sharing knowledge, building capacity and developing sustainability. PWG meetings can also be used as a platform for workshops and training.

Meetings with the POC should be at least quarterly, to report on progress, to seek guidance and decision. POC meetings are also an opportunity for mainstreaming.

PWG and POC meetings should be organized well in advanced considering government protocols, with stated objectives, complete agenda, and other relevant information. All documentation related to the meeting/workshop should be completed and send sufficiently ahead of the meeting. Meeting minutes should be distributed no later than a week after the meeting. Outputs of workshops should also be communicated within a reasonable time.

The Consulting Firm should demonstrate ability and experience in conducting projects in a participatory manner with a definite and well stated methodology and objectives for effective knowledge sharing, capacity building, sustainability and efficiency.

5. Implementation Arrangements

The Consulting Firm will work closely with RAJUK and associated government ministries to coordinate activities between relevant ministries and agencies. The Consulting Firm should submit an inception report no later than two months after receiving the authorization to proceed. The inception report should include explanation of the scope, general approach, team composition and organization, work plan, milestones, constraints and risk factors. The Inception report should include a chapter on the Firm's approach to Participatory Project Undertaking, explaining the process for identification and organization of the relevant stakeholders, the meeting and workshop schedules, consultations, and the strategy for sustainability and mainstreaming.

After the inception stage the Consulting Firm shall prepare a detailed schedule and task-flow diagram, Gantt and PERT-CPM Charts which depicts the interrelationship of various tasks in the assignment which lead to the completion works, milestone and mechanism of coordination with the client and other related entities. This would be kept and update throughout the Project duration.

A focal point will be identified at inception that would be the lead representative of Consulting Firm responsible for coordination and all interfaces with the Consulting Firm. The Project Manager of Consulting Firm will be the principal contact and will be expected to be readily available during project implementation. The Consulting Firm shall be responsible for all aspects of performance of services as set forth in the preceding sections of this TOR.

The Consulting Firm is expected to have a strong local presence in Bangladesh to support all the project tasks and more particularly the challenges associated with the data collection, the relationship with the government and other stakeholders, the interpretation of the findings and results, the preparation of the presentations and reports, the organization of meetings, workshops and consultations, and the logistics and operations.

6. Deliverables and Reporting Requirements:

The list of the deliverables is provided in Annexure-2.

7. Selection Procedure and Form of Contract

The firm will be selected following the World Bank's Guidelines: Selection and Use of Consultants by the World Bank for Operational Purposes and form of contract would be Complex Lump Sum Contract.

8. Duration of the Assignment

Duration of the contract would be three (3) years from mobilization, at which time the Greater Dhaka Risk Sensitive Strategy would be completed, presented and commented across government line ministries. The staging of the project has been provided earlier.

9. Consulting Firm Qualifications:

The Consulting Firm is free to propose a staffing plan and skill mix necessary to meet the objectives and scope of the services. If all the required skills are not available within the consulting firms, they are encouraged to make joint ventures with other firms. The consulting firm should be able to demonstrate:

- Have core expertise and competency with a minimum of ten (10) years of experience in land use planning, land use management and urban development including disaster risk mitigation and disaster risk management;
- Must have demonstrated experience (a minimum of 5 years) in risk sensitive land use planning and management, mainstreaming of risk assessment and analysis in land use planning and zoning, with completed similar large scale risk sensitive urban risk assessment projects.
- Demonstrated competency in exposure data collection, remote sensing, GIS, translation and interpretation of vulnerability and seismic indicators into planning variables.
- Knowledge of global experiences in institutional arrangements and public policy environment associated with disaster risk reduction, urban and regional land use management, hazard overlay zoning, specific use zoning such as in California, Latin American and New Zealand for Earthquake, in Europe for Flood, and in Japan for earthquake preparedness and earthquake recovery and reconstruction.
- Proven ability to problem-solve and to establish a strategic and constructive environment for the promotion and adoption of sensible public policy for urban risk mitigation within complex government setting to build consensus and to ensure a 'win-win' outcome.
- Experience in participatory approach for project execution.
- Familiarity with Bangladesh governance system and with Bangladesh disaster risk management legal, regulatory and institutional setting and past experiences, major initiatives by government and major donors and development institutions;
- Proven global leadership and competency in the field.

Consultant's Personnel

The consultant shall provide sufficient and qualified personnel for the project. The tentative input of the personnel for the services provided above is 200-man month (10 professional key staff) excluding support staff. A sufficient number backup staffs shall be employed by the Consultant to ensure that the tasks are conducted and as required by the client. In addition, there will be sufficient support staffs in the office for all sorts of administrative and clerical supports, documentation, etc. An indicative staff inputs and TORs for key staffs are attached in Annexure-2.

9. Reporting and Management of the Assignment

The assignment has been commissioned by the Government of Bangladesh. The consultant will report to RAJUK PIU Director. The project will be monitored and evaluated based on a result-oriented approach.

Annex B. Stockholder's Questionnaires

General Questionnaire

1- What is your general vision on "Disaster Risk Management (*DRM*)" in terms of:

- Disaster risk factors related your objectives and actions
- Key drivers, consequences, restrictions, opportunities, goals and measures of DRM implementation related your objectives and actions
- Role of your organization within DRM framework (*Prior/During/Post disaster period*)
- Inter-relationships between your and other academic communities, NGOs or international/national organizations within DRM framework

2- Is there any previously developed program for the implementation of the DRM by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Hazard, vulnerability and capacity assessment
- Disaster risk identification and monitoring
- Data collection, analysis, planning and reporting
- Risk reduction planning and risk reduction management
- Identification of vulnerable groups in the population
- Multidisciplinary plans covering multi hazards"*?(please indicate the hazards covered by the plan)*
- Community preparedness plan and Early warning system
- Establish reserve stocks and alternative
- Formulating emergency and disaster response such as (*evacuation plans/maps for vulnerable areas, emergency assistance, law and order during disaster and etc.*)
- Rehabilitation and rebuilding programs within post disaster period
- Financial and regulatory instruments such as (*insurance or codes*)
- Promote collection and sharing of baseline loss and damage data
- Use foresight, scenarios and risk assessments for better preparedness to existing, emerging risks and new types of risks
- Further engage with the research community to better address disaster risk management knowledge and technology gaps
- Encourage stronger science policy interface in decision-making

3- What are the impacts of most damaging hazards occurring in the area, relating on your organization in terms of objectives and actions?

4- Do you keep any records of past disasters (*earthquakes, floods, drought, landslides/avalanche, land subsidence, urban settlements, epidemics, meteorological events, Tidal floods, and. and others including all natural and man-induced disasters*)?

- Historical experiences in event of disaster.
- The number of people victimized by the disaster.
- Level of vulnerability.

5- Which major historic structures, buildings or infrastructures in your organization are likely to be affected by future disasters?

6- Which major sectors in your organization such as (*agriculture, buildings, health, infrastructure, education, Water resources, Interior*), are likely to be affected by future disasters?

7- What are major job descriptions with Respect to DRM in your organization?

8- Please subscribe conditions, situations and any legal authorities required to access any data archive related to DRM project could help consulting team to handle all of the current potential and to avoid duplication of efforts.

- Hard copies of reports, dissertations, studies and statistical data
- CD-ROMs and any digital content
- Internet based data servers
- National and university libraries.

9- Any other thing that you may want to add:

- Recommended topics for reflection meetings within DRM framework
- Any recommendations to promote DRM project implementation.

The Ministry of Disaster Management and Relief

1- Do women participate in community decision making and management of DRR?

- **Level 1:** Women never participate in decision-making meetings on DRR.
- **Level 2:** Women occasionally participate in community decision-making on DRR, but usually as part of community meetings and do not occupy positions within the main decision-making body.
- **Level 3:** Women participate regularly in decision-making meetings and occasionally in the decision-making body though not in leadership positions.
- **Level 4:** Women regularly participate in decision-making meetings and always occupy positions within the main DRR decision-making body, though only occasionally the higher-level leadership positions.
- **Level 5:** Women regularly participate in decision-making meetings and occupy high level leadership positions within the decision-making body.

2- Is there an open debate within the community resulting in agreements about problems, solutions and priorities relating to disaster risk?

- **Level 1:** There is no open debate within the community about problems, solutions and priorities relating to disaster risks.
- **Level 2:** There is some (infrequent) open debate within the community about problems, solutions and priorities relating to disaster risks, but there is a low level of community participation.
- **Level 3:** There is some (infrequent) open debate within the community about problems, solutions and priorities relating to disaster risks with a good level of community participation that usually results in agreements.
- **Level 4:** There is frequent and participatory open debate with the community that always results in agreements about problems, solutions, priorities relating to disaster risks.
- **Level 5:** There is consistent and participatory open debate with the community that always results in agreements about problems, solutions and priorities relating to disaster risk that the community acts upon.

3- Are DRR knowledge and capacities being passed on to children formally through local schools and informally via oral tradition from one generation to the next?

- **Level 1:** There is minimal to no dissemination of DRR knowledge and capacities in the community, whether through formal or informal transmission.
- **Level 2:** Some DRR knowledge and capacities being passed on through oral tradition only; no knowledge and capacities being transferred through the local school system.
- **Level 3:** Some DRR knowledge and capacities being passed on through both oral tradition and local schools, however local teachers have not received formal training in DRR.
- **Level 4:** Some DRR knowledge and capacities being passed on through both oral tradition and local schools, with local teachers having received formal training on DRR.
- **Level 5:** Widespread dissemination of DRR knowledge and capacities through both oral tradition and local schools, with teachers trained in DRR and the school curriculum mainstreaming DRR.

4- Is there any mapping strategy of losses caused by disasters in previous events?

- **Level 1:** Some basic or superficial data on previous disaster events.
- **Level 2:** Continual registering of current disaster events, incomplete catalogues of the occurrence of some events and limited information on losses and effects.
- **Level 3:** some complete catalogues of disaster events, systemization of actual events and their economic, social, and environmental effects.
- **Level 4:** Complete inventory and multiple catalogues of disaster events; registry and detailed systemization of effects and losses.
- **Level 5:** Detailed inventory and complete mapping of all disaster events as well as corresponding consequences.

5- What is the current state of Advancement, coverage and maintenance of instrumentation in hazard monitoring and forecasting within hazard evaluation and mapping?

- **Level 1:** Minimum/deficient instrumentation.
- **Level 2:** Basic instrumentation networks with problems of updated technology and continuous maintenance.
- **Level 3:** Some networks with advanced technology; improved prognostics and information protocols established.
- **Level 4:** Good and progressive instrumentation, advanced research on the majority of hazards, and some automatic warning systems working.
- **Level 5:** Wide coverage of station and sensor networks for hazards in all parts of the territory; permanent and opportune analysis of information and automatic early warning systems working continuously.

6- What is the current state of Scope and frequency of promotion of disaster risk management issues to the public, and involvement of private sectors and NGOs in promotion activities?

- **Level 1:** Sporadic information on risk management in normal conditions and more frequently when disaster occur.
- **Level 2:** Press, radio and television coverage oriented towards preparedness in case of emergency. Production of illustrative materials on dangerous phenomena.
- **Level 3:** Frequent opinion programs on risk management issues at the territory level and local levels. Guidelines for vulnerability reduction. Work with communities and NGOs.
- **Level 4:** Generalized diffusion and progressive consciousness; conformation of some social networks for civil protection and NGOs that explicitly promote risk management issues and practice.
- **Level 5:** Wide scale participation and support from the private sector for diffusion activities. Consolidation of social networks and notable participation of professionals and NGOs at all levels.

7- What is the current state of comprehensiveness and details in reconstruction plans dealing with physical damage and social recovery based on risk scenarios over the territory?

- **Level 1:** Design and implementation of rehabilitation and reconstruction plans only after important disasters.
- **Level 2:** Planning of some provisional recovery measures in some cities.
- **Level 3:** Diagnostic procedure of planer for rehabilitating, for reparation of infrastructure
- **Level 4:** Ex ante undertaking of recovery plans and programs to support physical and social recovery are established in most cities.
- **Level 5:** Detailed reconstruction plans dealing with physical damage and social recovery based on risk scenarios. Specific legislation exists and anticipated measures for reactivation.

8- What is the current state of implementation, expertise, and financial autonomy of reserve funds for operating a risk management system incorporated by inter-institutional, multi-sectorial and decentralizing organizations?

- **Level 1:** Basic organizations at the national level arranged in commissions, principally with an emergency response approach and dependent on funds from the nation.
- **Level 2:** Inter-institutional and multi-sectorial organization for integral risk management established and supported by national level resources, formulation of a general risk management plan.
- **Level 3:** Inter-institutional risk management systems active at local level in various counties. Inter-ministerial work in the design of public policies for vulnerability reduction. Some occasional funds to co-finance risk management project in the municipality exist in an inter-institutional way / Economic support and search for international funds for institutional development and strengthening of risk management in the whole country.
- **Level 4:** Continuous implementation of risk management projects associated with programs of adaptation to environmental protection, climate change, and energy. Reserve funds to co-finance projects, institutional strengthening and recovery in times of disaster established locally.
- **Level 5:** Expert personnel with wide experience incorporating risk management in sustainable human development planning in major counties. Reserve funds for inter-institutional strengthening operating in the majority of counties.

9- What is the current state of insurance coverage for private and public assets, implementation of loss transfers strategies (such as reinsurance groups, etc.) and economic incentive for risk reduction and mass insurance?

- **Level 1:** Little or no insurance mechanism available for private goods, buildings, corporations and local governments.
- **Level 2:** Ad-hoc mechanisms to support the victims of past disasters by transferring a significant share of financial losses to the nation.
- **Level 3:** Insurance against natural disasters is gradually developing on probabilistic risk evaluations basis.
- **Level 4:** Insurance coverage for a significant share of private and public buildings; limited cost sharing mechanisms at local government level.
- **Level 5:** Widespread coverage for private and public buildings; substantial insurance penetration for plants, equipment, and business interruption; existence of government-sponsored disaster funds and legislation to support disaster-stricken municipalities. Well-developed risk transfer instruments exist (such as reinsurance groups, etc.) and joint programs between government and insurance companies for generating economic incentives for risk reduction and mass insurance.

10- What is the current state of Details/accuracy in hazard mapping and evaluation of hazards within vulnerability and risk assessment process?

- **Level 1:** Superficial evaluation and basic maps covering the influence and susceptibility of hazards.
- **Level 2:** Some descriptive and qualitative studies of hazard-prone terrain or hazard studies for larger regions and some specific areas.
- **Level 3:** Some hazard maps based on probabilistic techniques for national/county level and for some smaller regions. Generalized use of GIS for mapping the principle hazards.
- **Level 4:** Evaluation is based on advanced and adequate resolution methodologies for the majority of hazards. Microzonation of some regions based on probabilistic techniques.
- **Level 5:** Detailed studies of hazards throughout the country/county. Micro zoning of the majority of cities and detailed hazard maps at national/county level.

11- Are there clear, agreed and stable DRR partnerships between the community and other actors (local authorities, NGOs, businesses, etc.)?

- **Level 1:** There are no DRR partnerships between the community and other actors.
- **Level 2:** There are agreed DRR partnerships between the community and other actors but these are unstable in frequency and unclear to the community. These partnerships provide one-off and piecemeal access to funds or resources for DRR and recovery.
- **Level 3:** There are agreed DRR partnerships, between the community and other actors that are unstable in frequency and are clearly understood by some community members. These partnerships provide increased access to funds or resources for more long term DRR and recovery actions.
- **Level 4:** There are agreed, stable and effective DRR partnerships, developed with some degree of community participation, that are clearly understood by most community members. These partnerships provide access to funds or resources that are linked within a long term strategy for DRR and recovery.
- **Level 5:** There are agreed and stable and effective DRR partnerships, developed with a high degree of community leadership, that are clearly understood by most community members. These partnerships provide access to all funds or resources required to achieve a long term strategy linked to DRR and recovery.

12- Does the community use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?

- **Level 1:** Community has no contingency plan.
- **Level 2:** Community has a contingency plan but this was not prepared in a participatory way, nor does it take into account the needs of vulnerable groups. Few community members know its content and it is currently not being applied.
- **Level 3:** Community has a contingency plan that was prepared in a participatory way that takes into account the needs of some vulnerable groups. Some community members know its content but it is only occasionally applied and updated.
- **Level 4:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account the needs of most vulnerable groups; most community members know its content however it is only occasionally applied and updated.
- **Level 5:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account needs of most vulnerable groups; majority of community members know its content and it is regularly applied and updated.

13- Does the community have a secure supply of food and water and manages an equitable distribution system during disasters?

- **Level 1:** There is frequent scarcity of food and water during adverse conditions/emergencies.
- **Level 2:** Some households have a minimum food reserve; community access to water is often disrupted during adverse conditions/emergencies.
- **Level 3:** Majority of households have a food reserve in case of adverse conditions/emergencies and measures are being taken to reduce vulnerability of water supply, AND/OR there is community storage but it is poorly functional.
- **Level 4:** Community is organized to collectively store food and water supply is secure for emergencies/periods of scarcity; equitable distribution management system is weak.
- **Level 5:** Community is organized to collectively store food and to manage an equitable distribution system; water supply is secure for emergencies/periods of scarcity.

14- What is the current state of popularization and frequency of training program on emergency response among the community and in coordination with other organizations and NGOs?

- **Level 1:** Occasional informative meetings with community in order to illustrate emergency procedures during disasters.
- **Level 2:** Sporadic training courses with civil society organizations dealing with disaster related themes.
- **Level 3:** Community training activities are regularly programmed on emergency response in coordination with community development organizations and NGOs.
- **Level 4:** Courses on preparedness, prevention and reduction of risk are run frequently with communities in the majority of cities and municipalities.
- **Level 5:** Permanent prevention and disaster response courses in all municipalities in coordination with other organizations and NGOs.

15- Does the community have a trained and operating organization in disaster preparedness and response?

- **Level 1:** The community does not have a trained organization responsible for emergency preparedness and response.
- **Level 2:** There is a community organization responsible for emergency preparedness and response but only some of its members have been formally trained in DRR skills and its operational capacity is weak.
- **Level 3:** There is a community organization responsible for emergency preparedness and response and its members have been trained in DRR skills but it only operates in emergencies.
- **Level 4:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members and carries out preparedness activities and response in emergencies.
- **Level 5:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members, performs prevention, preparedness, response and recovery and effectively coordinates with external agencies.

16- Has the community carried out participatory hazard assessments, shared the findings and have human resources capable of conducting/updating these assessments?

- **Level 1:** Participatory hazard assessment and/or hazard mapping has never been carried out in a structured and participatory way in the community.
- **Level 2:** Participatory hazard assessment and/or hazard mapping has been carried out in the community, findings were not shared and the document/mapping is currently outdated or not in use.
- **Level 3:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use but findings have only been shared with some community members.
- **Level 4:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with most or all members of the community.
- **Level 5:** A participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with all members of the community; the community has human resources capable of conducting/updating this assessment/mapping.

17- Does the community employ hazard-resistant livelihoods practices for food security?

- **Level 1:** No hazard-resistant livelihoods practices are being employed in the community and there is food scarcity during certain periods of the year.
- **Level 2:** Few community members employ hazard-resistant livelihoods practices but they are the exception.
- **Level 3:** Some community members employ hazard-resistant livelihoods practices.
- **Level 4:** Most community members employ hazard-resistant livelihoods practices.
- **Level 5:** All community members employ hazard-resistant livelihoods practices and food supplies remain secure during emergencies as a result.

18- Are the vulnerable groups in the community included/represented in community decision making and management of DDR?

- **Level 1:** Vulnerable groups never participate in decision-making on DRR.
- **Level 2:** Some vulnerable groups occasionally participate/are represented in community decision-making on DRR, but usually as part of wider community meetings and do not occupy positions in the main decision-making body.
- **Level 3:** Some vulnerable groups participate/are represented regularly in decision-making meetings and in the decision-making body but do not occupy leadership positions.
- **Level 4:** Most vulnerable groups regularly participate/are represented in decision-making meetings and some occupy leadership positions in the DRR decision-making body.
- **Level 5:** All vulnerable groups regularly participate in decision-making/ are represented at meetings and some occupy leadership positions in the decision-making body.

19- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

20- What is the current state of information and warning systems implementation?

- **Level 1:** No early warning system.
- **Level 2:** Basic early warning systems available for decision-makers and risk managers
- **Level 3:** Adequate early warning systems coupled with media announcements, reaching a majority of the population ahead of an event.
- **Level 4:** Advanced early warning systems coordinated with emergency response in essential government services and lifelines
- **Level 5:** Advanced early warning systems, integrated with preparedness and emergency response plans.

21- What is the current state of coordination between public, private and community based bodies for response in case of emergencies and testing frequency of contingency plans and updating frequency for operational procedures?

- **Level 1:** Continuity plans do not exist or are not operational (no trained personnel, no updating, etc.).
- **Level 2:** Basic contingency plans are in place in ministries, large hospitals, public utilities, large municipalities, and major corporations.
- **Level 3:** Legal requirements and/or incentive mechanisms (e.g. use of certification) for public and private organizations to adopt extensive preparedness and continuity plans.
- **Level 4:** Some coordination of continuity plans among ministries, local authorities and operators of lifelines; occasional joint simulation exercises.
- **Level 5:** Widespread emergency preparedness and continuity planning in public and private organizations; frequent updating of plans in larger organizations based on the results of joint exercises.

22- Is there an operational Early Warning System in the community?

- **Level 1:** In spite of the local knowledge of some people, the community rarely knows about the coming of a hazard that could significantly impact the community.
- **Level 2:** Due to local knowledge sometimes the community knows when a hazard that could be dangerous is approaching, but they do not always take the appropriate measures.
- **Level 3:** Additional to local knowledge, the community has tools for monitoring hazards and established communication channels for alert dissemination, but these are not always effective.
- **Level 4:** Additional to local knowledge, the community has effective tools to monitor hazards and communicate alerts. The operation and maintenance of this early warning system is supported by the regional/national risk management authorities. However, simulation drills are not regularly carried out.
- **Level 5:** Additional to local knowledge, the community is equipped with a functioning Early Warning System with reliable hazard monitoring and alert dissemination fully supported by regional/national risk management authorities. Simulation drills are regularly carried out and weaknesses addressed.

Infrastructure Division & Programming Division Planning Commission

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?

- **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
- **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
- **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
- **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
- **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- Are the local trade and transport links with markets for products, labour and services protected against hazards and shocks?
   - **Level 1:** All local trade and transport links that the community depends on are extremely vulnerable to hazards and external shocks.
   - **Level 2:** Most of the local trade and transport links that the community depend on are extremely vulnerable to hazards and external shocks.
   - **Level 3:** Some of the local trade and transport links that the community depends on are vulnerable to hazards and external shocks but some measures are in place to protect them.
   - **Level 4:** Most of the local trade and transport links that the community depends on are protected from hazards and external shocks.
   - **Level 5:** All local trade and transport links that the community depend on are protected from hazards and external shocks.

4- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)
   - Minimizing the consumption of resources, including water and energy.
   - Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
   - Promoting the re-use and recycling of waste materials
   - Reducing leakage from the water supply system to help reduce demand for water.
   - Encouragement of more efficient water use and consumption by consumers.
   - Development of infrastructures that are energy efficient or using renewable energy sources.
   - Reducing leakage from the supply network.
   - Promoting the efficient use of energy and resources.
   - Minimizing the demand for raw materials.
   - Encouragement of more use of sustainable design and materials.

5- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

6- Does the community have a secure supply of food and water and manages an equitable distribution system during disasters?

- **Level 1:** There is frequent scarcity of food and water during adverse conditions/emergencies.
- **Level 2:** Some households have a minimum food reserve; community access to water is often disrupted during adverse conditions/emergencies.
- **Level 3:** Majority of households have a food reserve in case of adverse conditions/emergencies and measures are being taken to reduce vulnerability of water supply, AND/OR there is community storage but it is poorly functional.
- **Level 4:** Community is organized to collectively store food and water supply is secure for emergencies/periods of scarcity; equitable distribution management system is weak.
- **Level 5:** Community is organized to collectively store food and to manage an equitable distribution system; water supply is secure for emergencies/periods of scarcity.

7- Does the community have access to health care facilities and health workers equipped and trained to respond to physical and mental health consequences of disasters and lesser hazard events, and supported by access to emergency health services, medicines, etc.?

- **Level 1:** There is no one in the community trained or qualified to practice healthcare and there is no access to healthcare in the surrounding area.
- **Level 2:** There are occasional visits from trained community health workers and there is a healthcare facility available but access is very difficult and/or quality of service is poor.
- **Level 3:** Trained community health workers consistently visit and there is access to a healthcare facility assisted by a trained auxiliary nurse; however, medicines and equipment are insufficient.
- **Level 4:** Trained community health workers consistently visit and there is an accessible healthcare facility with a physician and nurse, with the most essential equipment, medicines and referral mechanisms.
- **Level 5:** Trained community health workers consistently visit and there is an accessible healthcare facility completely equipped with all necessary staff, equipment and medicines for health care and referrals for emergencies.

Rajdhani Unnayan Kartripakkha (RAJUK)

1- Do the community's cultural attitudes and values (e.g. expectations of help/self-sufficiency, religious/ideological views) enable it to adapt to and recover from shocks and stresses? Resilience Characteristics

- **Level 1:** Community plays a weak role due to its belief that adaptation and recovery from shocks and stresses is beyond their control and primarily the responsibility of external entities (deities, government, NGOs etc.).
- **Level 2:** Community believes they have a key role to play in adaptation to and recovery from shocks and stress but cultural attitudes and values contributing to lack of social cohesion (prejudice, hostility) prevents them from undertaking that role.
- **Level 3:** Community plays a more active role in adapting to and recovering from shocks and stresses due to adequate level of social cohesion, however cultural attitudes and values contributing to gender inequality and/or lack of protection for vulnerable groups in the community compromises the effectiveness of this role.
- **Level 4:** Community plays an effective role in adapting to and recovering from shocks and stresses due to cultural values and attitudes which contribute to high level of social cohesion.
- **Level 5:** Community plays a proactive and effective role in adapting to and recovering from shocks and stresses due to cultural values and attitudes which are conducive to ensuring high level of social cohesion and a shared vision in DRR.

2- Is there any previously developed program for the implementation of the SEA in the field of (*Landscape and Visual*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Protection and improvement of the natural beauty of the area.
- Protection and improvement of the character of landscapes, townscapes.
- Avoiding adverse effects on, and enhancing where possible, protected/designated landscapes (*including woodlands*) such as national parks.
- Minimizing adverse visual impacts.

3- What is the current state of considering risks in land use and urban planning?

- **Level 1:** Consideration of some means for identifying risk, and environmental protection in physical planning.
- **Level 2:** Promulgation of some local regulations and legislation that consider hazards as a factor in development planning.
- **Level 3:** Progressive formulation of land use regulations in the various cities that take into account hazards and risks.
- **Level 4:** wide ranging formulation and updating for territorial plans with a preventive approach in the majority area of country or municipality.
- **Level 5:** generalized approval and control of implementation of territorial organization plans that include risk analysis as major factor.

4- Is there any previously developed program for the implementation of the SEA in the field of (*Geology, Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Maintenance or improvement of the quality of soils/agricultural land.
- Protection and enhancement of sites designated for their geological interest.
- Maintenance and enhancement of soil function and health.
- Using Previously Developed Land (*PDL*) to reduce the prevalence of derelict land.
- Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
- Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
- Minimizing the loss of best and most versatile agricultural land.
- Minimizing the conflict with existing land use patterns.
- Minimizing land contamination.

5- Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?

- **Level 1:** No community decision-making process around land use and planning.
- **Level 2:** Community land use and planning does not consider hazard risks and vulnerabilities
- **Level 3:** Community land use and planning considers hazard risks and vulnerabilities in the short-term.
- **Level 4:** Community land use and planning considers hazard risks and vulnerabilities in the long-term (community land use plan if applicable).
- **Level 5:** Community land use and planning which considers hazard risks and vulnerabilities in the long-term (local land development plan if applicable), which is supported by local authority/central government land use policy and planning.

6- Are the local trade and transport links with markets for products, labour and services protected against hazards and shocks?

- **Level 1:** All local trade and transport links that the community depends on are extremely vulnerable to hazards and external shocks.
- **Level 2:** Most of the local trade and transport links that the community depend on are extremely vulnerable to hazards and external shocks.
- **Level 3:** Some of the local trade and transport links that the community depends on are vulnerable to hazards and external shocks but some measures are in place to protect them.
- **Level 4:** Most of the local trade and transport links that the community depends on are protected from hazards and external shocks.
- **Level 5:** All local trade and transport links that the community depend on are protected from hazards and external shocks.

Puplic Workers Department (PWD)

1- What is the current state of housing improvement works and implementation of relocation program of housing in prone-areas / non mitigable risk zones?
   - **Level 1:** Identification and inventory of a few of human settlements located in hazard prone areas.
   - **Level 2:** Promulgation of legislation which establishes the priority of dealing with hazard risk in deteriorated urban areas.
   - **Level 3:** Programs for upgrading the surroundings, existing housing, and relocation from prone areas in the most critical areas.
   - **Level 4:** Progressive intervention of human settlements in hazard prone areas in the majority of regions/areas and adequate treatment of the cleared areas.
   - **Level 5:** Notable control of hazard prone areas in the country/county and relocation of the majority of housing constructed in non mitigable risk zones.

2- What is the current state of considering risks in land use and urban planning?
   - **Level 1:** Consideration of some means for identifying risk, and environmental protection in physical planning.
   - **Level 2:** Promulgation of some local regulations and legislation that consider hazards as a factor in development planning.
   - **Level 3:** Progressive formulation of land use regulations in the various cities that take into account hazards and risks.
   - **Level 4:** wide ranging formulation and updating for territorial plans with a preventive approach in the majority area of country or municipality.
   - **Level 5:** generalized approval and control of implementation of territorial organization plans that include risk analysis as major factor.

3- Is there any previously developed program for the implementation of the SEA in the field of (*Geology*, *Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)
   - Maintenance or improvement of the quality of soils/agricultural land.
   - Protection and enhancement of sites designated for their geological interest.
   - Maintenance and enhancement of soil function and health.
   - Using Previously Developed Land (*PDL*) to reduce the prevalence of derelict land.
   - Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
   - Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
   - Minimizing the loss of best and most versatile agricultural land.
   - Minimizing the conflict with existing land use patterns.
   - Minimizing land contamination.

4- Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?
   - **Level 1:** No community decision-making process around land use and planning.
   - **Level 2:** Community land use and planning does not consider hazard risks and vulnerabilities
   - **Level 3:** Community land use and planning considers hazard risks and vulnerabilities in the short-term.
   - **Level 4:** Community land use and planning considers hazard risks and vulnerabilities in the long-term (community land use plan if applicable).
   - **Level 5:** Community land use and planning which considers hazard risks and vulnerabilities in the long-term (local land development plan if applicable), which is supported by local authority/central government land use policy and planning.

5- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?
   - **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
   - **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
   - **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
   - **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
   - **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

6- What is the current state of enforcing safety standards and construction codes and updating them based on local particularities?
   - **Level 1:** Voluntary use of norms and codes from other countries without major adjustments.
   - **Level 2:** Adaptation of some requirements and specifications according to some national and local criteria and particularities.
   - **Level 3:** Promulgation and updating of obligatory national standards/norms based on international norms.
   - **Level 4:** Technological updating of the majority of security and construction standards for new and existing buildings with special requirements for special buildings and life lines.
   - **Level 5:** Permanent updating of standards and security norms: establishment of local regulations for construction.

Local Government Engineering deoartment (LGED)

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?
   - **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
   - **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
   - **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
   - **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
   - **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?
   - **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
   - **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
   - **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
   - **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.

- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

4- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.

Encouragement of more use of sustainable design and materials.

Department of Environment (DOE)

1- What is the current state of planning for environmental protection and intervention in deteriorated/strategic basins and sensitive zones and implementation of hazard-event control and protection techniques?

- **Level 1:** Mapping of basins and areas with severe environmental deterioration or those considered to be most fragile.
- **Level 2:** Promulgation of legal dispositions at national/county/municipality level and some local ones that establish the obligatory nature of reforestation, environmental protection and river basin planning
- **Level 3:** Formulation of some plans for organization and intervention in strategic water basins and sensitive zones taking into account risk and vulnerability aspects.
- **Level 4:** Appreciable number of regions and water basins with environmental protection plans, impact studies and ordering of agricultural areas and that consider risk a factor in determining investment divisions.
- **Level 5:** Intervention in a considerable number of deteriorated basins, sensitive zones and strategic ecosystems. Majority regions have environmental intervention and protection plans.

2- What is the current state of budget allocation to local organizations / organizations in various stages of the risk management system, incentives for environmental protection and security?

- **Level 1:** Limited allocation of national budget to competent institutions for
- **Level 2:** Legal norms establishing budgetary allocations to national level organizations with risk management objectives.
- **Level 3:** Legally specified specific allocations for risk management at the local level and frequent undertaking of inter administrative agreements for execution of prevention projects.
- **Level 4:** Progressive allocation of discretionary expenses at national and municipal levels for vulnerability reduction, the creation of incentives for environmental protection and security.

Level 5: As outstanding and national orientation and support for loans from multilateral loan organizations

3- Does the community adopt sustainable environmental management practices that reduce disaster risk and adapt to new risks related to climate change?

- **Level 1:** There is no consideration for sustainable environmental management practices in the community.
- **Level 2:** There are little or no sustainable environmental management practices utilized by the community (environmental protection measures tend to be one off, piecemeal and short-term) and there are few or no measures taken to adapt to new risks related to climate change.
- **Level 3:** There are some sustainable environmental management practices utilized by the community (environmental protection measures are more numerous and longer term) and there are some measures taken to adapt to new risks related to climate change.
- **Level 4:** Sustainable environmental management practices are utilized by the majority of people in the community with medium adaptation capacity to new risks related to climate change.
- **Level 5:** Sustainable environmental management practices are utilized widely throughout the community with high adaptation capacity to new risks related to climate change.

4- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

5- Is there any previously developed program for the implementation of the SEA in the field of (*Air Quality and Climate*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing emissions of pollutant gases and particulates and enhance air quality.
- Reducing the need to travel and promote sustainable modes of transport.
- Reducing greenhouse gas emissions arising.
- Taking into account, and where possible adapt to, the potential effects of climate change to reduce vulnerability.
- Increasing the environmental resilience to the effects of climate change.

6- Is there any previously developed program for the implementation of the SEA in the field of (*Geology, Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Maintenance or improvement of the quality of soils/agricultural land.
- Protection and enhancement of sites designated for their geological interest.
- Maintenance and enhancement of soil function and health.
- Using Previously Developed Land (*PDL*) to reduce the prevalence of derelict land.
- Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
- Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
- Minimizing the loss of best and most versatile agricultural land.
- Minimizing the conflict with existing land use patterns.
- Minimizing land contamination.

7- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.

Encouragement of more use of sustainable design and materials.

8- Is there any previously developed program for the implementation of the SEA in the field of (*Biodiversity, Flora and Fauna*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Protection and enhancement of sites designated for nature conservation.
- Protection and enhancement non-designated sites.
- Connectivity Improvement between fragmented habitats to create functioning habitat corridors and to improve the resilience of habitats.
- Condition Improvement for priority habitats and habitats of priority species, and population restore of these species and other specially protected species.
- Avoiding activities likely to cause irreversible damage to natural heritage.
- Engaging more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognizing the value of the ecosystem services.
- Prevention of the spread/introduction of invasive non-native species.
- Recognizing the importance of allowing wildlife to adapt to climate change.

Department of disaster management (DDM)

1- Is there a high level of community volunteerism in all aspects of preparedness, response and recovery; representative of all sections of community?

- **Level 1:** There is very low to negligible level of community volunteerism in aspects of preparedness, response and recovery and there is no adherence to relevant protocol.
- **Level 2:** There is some level of community volunteerism but not in all aspects of preparedness, response and recovery, and it is not representative of all sections of the community and there is no adherence to relevant protocol.
- **Level 3:** There is high level of community volunteerism but not in all aspects of preparedness, response and recovery and it is not representative of all sections of the community, with limited adherence to relevant protocol.
- **Level 4:** There is a high level of community volunteerism in all aspects of preparedness, response and recovery, but still is not representative of all sections of the community, with limited adherence to relevant protocol.
- **Level 5:** There is a high level of community volunteerism in all aspects of preparedness, response and recovery, which is representative of all sections of the community, with full adherence to relevant protocol.

2- Is there an open debate within the community resulting in agreements about problems, solutions and priorities relating to disaster risk?

- **Level 1:** There is no open debate within the community about problems, solutions and priorities relating to disaster risks.
- **Level 2:** There is some (infrequent) open debate within the community about problems, solutions and priorities relating to disaster risks, but there is a low level of community participation.
- **Level 3:** There is some (infrequent) open debate within the community about problems, solutions and priorities relating to disaster risks with a good level of community participation that usually results in agreements.
- **Level 4:** There is frequent and participatory open debate with the community that always results in agreements about problems, solutions, priorities relating to disaster risks.
- **Level 5:** There is consistent and participatory open debate with the community that always results in agreements about problems, solutions and priorities relating to disaster risk that the community acts upon.

3- Do women participate in community decision making and management of DRR?

- **Level 1:** Women never participate in decision-making meetings on DRR.
- **Level 2:** Women occasionally participate in community decision-making on DRR, but usually as part of community meetings and do not occupy positions within the main decision-making body.
- **Level 3:** Women participate regularly in decision-making meetings and occasionally in the decision-making body though not in leadership positions.
- **Level 4:** Women regularly participate in decision-making meetings and always occupy positions within the main DRR decision-making body, though only occasionally the higher-level leadership positions.
- **Level 5:** Women regularly participate in decision-making meetings and occupy high level leadership positions within the decision-making body.

4- Is there any mapping strategy of losses caused by disasters in previous events?

- **Level 1:** Some basic or superficial data on previous disaster events.
- **Level 2:** Continual registering of current disaster events, incomplete catalogues of the occurrence of some events and limited information on losses and effects.
- **Level 3:** some complete catalogues of disaster events, systemization of actual events and their economic, social, and environmental effects.
- **Level 4:** Complete inventory and multiple catalogues of disaster events; registry and detailed systemization of effects and losses.
- **Level 5:** Detailed inventory and complete mapping of all disaster events as well as corresponding consequences.

5- What is the current state of Advancement, coverage and maintenance of instrumentation in hazard monitoring and forecasting within hazard evaluation and mapping?
   - **Level 1:** Minimum/deficient instrumentation.
   - **Level 2:** Basic instrumentation networks with problems of updated technology and continuous maintenance.
   - **Level 3:** Some networks with advanced technology; improved prognostics and information protocols established.
   - **Level 4:** Good and progressive instrumentation, advanced research on the majority of hazards, and some automatic warning systems working.
   - **Level 5:** Wide coverage of station and sensor networks for hazards in all parts of the territory; permanent and opportune analysis of information and automatic early warning systems working continuously.

6- What is the current state of Scope and frequency of promotion of disaster risk management issues to the public, and involvement of private sectors and NGOs in promotion activities?
   - **Level 1:** Sporadic information on risk management in normal conditions and more frequently when disaster occur.
   - **Level 2:** Press, radio and television coverage oriented towards preparedness in case of emergency. Production of illustrative materials on dangerous phenomena.
   - **Level 3:** Frequent opinion programs on risk management issues at the territory level and local levels. Guidelines for vulnerability reduction. Work with communities and NGOs.
   - **Level 4:** Generalized diffusion and progressive consciousness; conformation of some social networks for civil protection and NGOs that explicitly promote risk management issues and practice.
   - **Level 5:** Wide scale participation and support from the private sector for diffusion activities. Consolidation of social networks and notable participation of professionals and NGOs at all levels.

7- What is the current state of comprehensiveness and details in reconstruction plans dealing with physical damage and social recovery based on risk scenarios over the territory?
   - **Level 1:** Design and implementation of rehabilitation and reconstruction plans only after important disasters.
   - **Level 2:** Planning of some provisional recovery measures in some cities.
   - **Level 3:** Diagnostic procedure of planer for rehabilitating, for reparation of infrastructure
   - **Level 4:** Ex ante undertaking of recovery plans and programs to support physical and social recovery are established in most cities.
   - **Level 5:** Detailed reconstruction plans dealing with physical damage and social recovery based on risk scenarios. Specific legislation exists and anticipated measures for reactivation.

8- What is the current state of implementation, expertise, and financial autonomy of reserve funds for operating a risk management system incorporated by inter-institutional, multi-sectorial and decentralizing organizations?

- **Level 1:** Basic organizations at the national level arranged in commissions, principally with an emergency response approach and dependent on funds from the nation.
- **Level 2:** Inter-institutional and multi-sectorial organization for integral risk management established and supported by national level resources, formulation of a general risk management plan.
- **Level 3:** Inter-institutional risk management systems active at local level in various counties. Inter-ministerial work in the design of public policies for vulnerability reduction. Some occasional funds to co-finance risk management project in the municipality exist in an inter-institutional way / Economic support and search for international funds for institutional development and strengthening of risk management in the whole country.
- **Level 4:** Continuous implementation of risk management projects associated with programs of adaptation to environmental protection, climate change, and energy. Reserve funds to co-finance projects, institutional strengthening and recovery in times of disaster established locally.
- **Level 5:** Expert personnel with wide experience incorporating risk management in sustainable human development planning in major counties. Reserve funds for inter-institutional strengthening operating in the majority of counties.

9- What is the current state of insurance coverage for private and public assets, implementation of loss transfers strategies (such as reinsurance groups, etc.) and economic incentive for risk reduction and mass insurance?

- **Level 1:** Little or no insurance mechanism available for private goods, buildings, corporations and local governments.
- **Level 2:** Ad-hoc mechanisms to support the victims of past disasters by transferring a significant share of financial losses to the nation.
- **Level 3:** Insurance against natural disasters is gradually developing on probabilistic risk evaluations basis.
- **Level 4:** Insurance coverage for a significant share of private and public buildings; limited cost sharing mechanisms at local government level.
- **Level 5:** Widespread coverage for private and public buildings; substantial insurance penetration for plants, equipment, and business interruption; existence of government-sponsored disaster funds and legislation to support disaster-stricken municipalities. Well-developed risk transfer instruments exist (such as reinsurance groups, etc.) and joint programs between government and insurance companies for generating economic incentives for risk reduction and mass insurance.

10- What is the current state of Details/accuracy in hazard mapping and evaluation of hazards within vulnerability and risk assessment process?

- **Level 1:** Superficial evaluation and basic maps covering the influence and susceptibility of hazards.
- **Level 2:** Some descriptive and qualitative studies of hazard-prone terrain or hazard studies for larger regions and some specific areas.
- **Level 3:** Some hazard maps based on probabilistic techniques for national/county level and for some smaller regions. Generalized use of GIS for mapping the principle hazards.
- **Level 4:** Evaluation is based on advanced and adequate resolution methodologies for the majority of hazards. Microzonation of some regions based on probabilistic techniques.
- **Level 5:** Detailed studies of hazards throughout the country/county. Micro zoning of the majority of cities and detailed hazard maps at national/county level.

11- Are there clear, agreed and stable DRR partnerships between the community and other actors (local authorities, NGOs, businesses, etc.)?

- **Level 1:** There are no DRR partnerships between the community and other actors.
- **Level 2:** There are agreed DRR partnerships between the community and other actors but these are unstable in frequency and unclear to the community. These partnerships provide one-off and piecemeal access to funds or resources for DRR and recovery.
- **Level 3:** There are agreed DRR partnerships, between the community and other actors that are unstable in frequency and are clearly understood by some community members. These partnerships provide increased access to funds or resources for more long term DRR and recovery actions.
- **Level 4:** There are agreed, stable and effective DRR partnerships, developed with some degree of community participation, that are clearly understood by most community members. These partnerships provide access to funds or resources that are linked within a long term strategy for DRR and recovery.
- **Level 5:** There are agreed and stable and effective DRR partnerships, developed with a high degree of community leadership, that are clearly understood by most community members. These partnerships provide access to all funds or resources required to achieve a long term strategy linked to DRR and recovery.

12- What is the current state of popularization and frequency of training program on emergency response among the community and in coordination with other organizations and NGOs?

- **Level 1:** Occasional informative meetings with community in order to illustrate emergency procedures during disasters.
- **Level 2:** Sporadic training courses with civil society organizations dealing with disaster related themes.
- **Level 3:** Community training activities are regularly programmed on emergency response in coordination with community development organizations and NGOs.
- **Level 4:** Courses on preparedness, prevention and reduction of risk are run frequently with communities in the majority of cities and municipalities.
- **Level 5:** Permanent prevention and disaster response courses in all municipalities in coordination with other organizations and NGOs.

13- Does the community have a trained and operating organization in disaster preparedness and response?

- **Level 1:** The community does not have a trained organization responsible for emergency preparedness and response.
- **Level 2:** There is a community organization responsible for emergency preparedness and response but only some of its members have been formally trained in DRR skills and its operational capacity is weak.
- **Level 3:** There is a community organization responsible for emergency preparedness and response and its members have been trained in DRR skills but it only operates in emergencies.
- **Level 4:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members and carries out preparedness activities and response in emergencies.
- **Level 5:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members, performs prevention, preparedness, response and recovery and effectively coordinates with external agencies.

14- Does the community use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?

- **Level 1:** Community has no contingency plan.
- **Level 2:** Community has a contingency plan but this was not prepared in a participatory way, nor does it take into account the needs of vulnerable groups. Few community members know its content and it is currently not being applied.
- **Level 3:** Community has a contingency plan that was prepared in a participatory way that takes into account the needs of some vulnerable groups. Some community members know its content but it is only occasionally applied and updated.
- **Level 4:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account the needs of most vulnerable groups; most community members know its content however it is only occasionally applied and updated.
- **Level 5:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account needs of most vulnerable groups; majority of community members know its content and it is regularly applied and updated.

15- Does the community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?

- **Level 1:** The community has no access to formal or informal social protection schemes to support risk reduction.
- **Level 2:** Social cohesion within community provides informal social protection arrangements that support risk reduction at a small scale, but there is no access to formal mechanisms.
- **Level 3:** Community has limited (inconsistent) access to formal social protection schemes that only indirectly support risk reduction.
- **Level 4:** Community has access to formal social protection schemes that only indirectly support risk reduction.
- **Level 5:** Community has access to formal social protection schemes that both directly and indirectly support risk reduction.

16- Are the vulnerable groups in the community included/represented in community decision making and management of DDR?

- **Level 1:** Vulnerable groups never participate in decision-making on DRR.
- **Level 2:** Some vulnerable groups occasionally participate/are represented in community decision-making on DRR, but usually as part of wider community meetings and do not occupy positions in the main decision-making body.
- **Level 3:** Some vulnerable groups participate/are represented regularly in decision-making meetings and in the decision-making body but do not occupy leadership positions.
- **Level 4:** Most vulnerable groups regularly participate/are represented in decision-making meetings and some occupy leadership positions in the DRR decision-making body.
- **Level 5:** All vulnerable groups regularly participate in decision-making/ are represented at meetings and some occupy leadership positions in the decision-making body.

17- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

Bangladesh Meteorological Department (BMD)

1- What is the current state of information and warning systems implementation?

- **Level 1:** No early warning system.
- **Level 2:** Basic early warning systems available for decision-makers and risk managers
- **Level 3:** Adequate early warning systems coupled with media announcements, reaching a majority of the population ahead of an event.
- **Level 4:** Advanced early warning systems coordinated with emergency response in essential government services and lifelines
- **Level 5:** Advanced early warning systems, integrated with preparedness and emergency response plans.

2- Is there an operational Early Warning System in the community?

- **Level 1:** In spite of the local knowledge of some people, the community rarely knows about the coming of a hazard that could significantly impact the community.
- **Level 2:** Due to local knowledge sometimes the community knows when a hazard that could be dangerous is approaching, but they do not always take the appropriate measures.
- **Level 3:** Additional to local knowledge, the community has tools for monitoring hazards and established communication channels for alert dissemination, but these are not always effective.
- **Level 4:** Additional to local knowledge, the community has effective tools to monitor hazards and communicate alerts. The operation and maintenance of this early warning system is supported by the regional/national risk management authorities. However, simulation drills are not regularly carried out.
- **Level 5:** Additional to local knowledge, the community is equipped with a functioning Early Warning System with reliable hazard monitoring and alert dissemination fully supported by regional/national risk management authorities. Simulation drills are regularly carried out and weaknesses addressed.

Education Engineering department

1- Does the community use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods?

- **Level 1:** Community has little or no local knowledge or perceptions of risk or scientific data and analysis (e.g. in the case of refugee camp or recent unplanned urbanization).
- **Level 2:** Community has some risk awareness based on local knowledge and perceptions of risk but this is not supported by scientific data or analysis.
- **Level 3:** Community has medium level of risk awareness based on local knowledge and perceptions of risk which is supported by one-off or piecemeal scientific data or analysis.
- **Level 4:** Community has high level of risk awareness based on local knowledge and perceptions of risk which is supported by longer term and more numerous scientific data or analysis.
- **Level 5:** Community has high level of risk awareness based on local knowledge and perceptions of risk which is reinforced by comprehensive scientific data and analysis as part of a long-term strategy for risk awareness.

2- What is the current state of wide ranging production of teaching materials, permanent schemes for community training, and provision of community training and education in hazards and disaster risk management?

- **Level 1:** Incipient incorporation of topics about hazards and risk management in formal education and programs for community participation.
- **Level 2:** Production of teaching guides in hazards and risk management for teachers and community leaders in some places.
- **Level 3:** widening of curricular reform to higher education programs to include hazards and risk management. Specialization courses offered at various universities. Considerable production of teaching materials and undertaking of frequent courses for community training.
- **Level 4:** As significant and progressive incorporation of disaster risk management in primary and secondary curricula.
- **Level 5:** High technical capacity in the country/county/municipality to generate risk knowledge. Generalized curricular reform throughout the territory and in all stages of education.

3- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

14-Do education services have the capacity to continue their operation without interruption during emergencies?

- **Level 1:** School frequently impacted (at least once a year) by disasters and shocks that result in suspension of school activities. School does not have a safety plan or emergency committee.
- **Level 2:** School impacted at least once every 5 years by disasters and shocks that result in suspension of school activities. Interruptions generally last for more than a month before activities are resumed. School does not have a safety plan or emergency committee.
- **Level 3:** School impacted at least once every 5 years by disasters and shocks that result in suspension of school activities. Interruptions last less than one month before activities are resumed. A school safety plan is in place and some of the preparedness measures identified have been implemented. A school emergency committee has been formed but it does not perform simulation drills.
- **Level 4:** School impacted at least once every 10 years by disasters and shocks that result in suspension of school activities. Interruptions are generally less than one week before activities are resumed. A school safety plan is in place and most of the preparedness measures identified have been implemented. A school emergency committee is in place and at least one simulation drill has been performed in the last school year.
- **Level 5:** School's operation rarely impacted by emergencies (or impacts result in minimum disruption to school activities), a school safety plan is in place and most of the preparedness measures have been implemented. A school emergency committee is in place and regularly performs simulation drills and reviews/updates the school safety plan.

Fire Service & Civil Defense (FSCD)

1- What is the current state of comprehensiveness and details in reconstruction plans dealing with physical damage and social recovery based on risk scenarios over the territory?

- **Level 1:** Design and implementation of rehabilitation and reconstruction plans only after important disasters.
- **Level 2:** Planning of some provisional recovery measures in some cities.
- **Level 3:** Diagnostic procedure of planer for rehabilitating, for reparation of infrastructure
- **Level 4:** Ex ante undertaking of recovery plans and programs to support physical and social recovery are established in most cities.
- **Level 5:** Detailed reconstruction plans dealing with physical damage and social recovery based on risk scenarios. Specific legislation exists and anticipated measures for reactivation.

2- Does the community take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs?

- **Level 1:** Community has a mainly passive role in response and recovery actions.
- **Level 2:** Community usually plays an active role in response and recovery actions, but these actions do not prioritize need and reach only few of the affected community members.
- **Level 3:** Community usually plays a leading role in response and recovery actions that can reach most affected community members, but the needs of vulnerable groups are still not prioritized.
- **Level 4:** Community always plays a leading role in response and recovery actions, reaches most of the affected members in the community and prioritizes the needs of some vulnerable groups.
- **Level 5:** Community always plays a leading role in response and recovery actions, which can reach all of its affected members and needs of all vulnerable groups are prioritized and met.

3- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.
- Encouragement of more use of sustainable design and materials.

4- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?

- **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
- **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
- **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
- **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
- **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

5- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

6- Are the local trade and transport links with markets for products, labour and services protected against hazards and shocks?
   - **Level 1:** All local trade and transport links that the community depends on are extremely vulnerable to hazards and external shocks.
   - **Level 2:** Most of the local trade and transport links that the community depend on are extremely vulnerable to hazards and external shocks.
   - **Level 3:** Some of the local trade and transport links that the community depends on are vulnerable to hazards and external shocks but some measures are in place to protect them.
   - **Level 4:** Most of the local trade and transport links that the community depends on are protected from hazards and external shocks.
   - **Level 5:** All local trade and transport links that the community depend on are protected from hazards and external shocks.

Dhaka Water Supply and Sewage Authority (DWASA)

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?
   - **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
   - **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
   - **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
   - **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
   - **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- Does the community have a secure supply of food and water and manages an equitable distribution system during disasters?
   - **Level 1:** There is frequent scarcity of food and water during adverse conditions/emergencies.
   - **Level 2:** Some households have a minimum food reserve; community access to water is often disrupted during adverse conditions/emergencies.
   - **Level 3:** Majority of households have a food reserve in case of adverse conditions/emergencies and measures are being taken to reduce vulnerability of water supply, AND/OR there is community storage but it is poorly functional.
   - **Level 4:** Community is organized to collectively store food and water supply is secure for emergencies/periods of scarcity; equitable distribution management system is weak.
   - **Level 5:** Community is organized to collectively store food and to manage an equitable distribution system; water supply is secure for emergencies/periods of scarcity.

Civil Aviation Authority (CAA)

1- Are the local trade and transport links with markets for products, labour and services protected against hazards and shocks?
   - **Level 1:** All local trade and transport links that the community depends on are extremely vulnerable to hazards and external shocks.
   - **Level 2:** Most of the local trade and transport links that the community depend on are extremely vulnerable to hazards and external shocks.
   - **Level 3:** Some of the local trade and transport links that the community depends on are vulnerable to hazards and external shocks but some measures are in place to protect them.
   - **Level 4:** Most of the local trade and transport links that the community depends on are protected from hazards and external shocks.
   - **Level 5:** All local trade and transport links that the community depend on are protected from hazards and external shocks.

2- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?

- **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
- **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
- **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
- **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
- **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

3- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?

- **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
- **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but hazard mitigation measures are being taken.
- **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
- **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
- **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

Dhaka Electric Supply Company (DESCO)

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?

- **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
- **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
- **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
- **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
- **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- What is the current state of information and warning systems implementation?
   - **Level 1:** No early warning system.
   - **Level 2:** Basic early warning systems available for decision-makers and risk managers
   - **Level 3:** Adequate early warning systems coupled with media announcements, reaching a majority of the population ahead of an event.
   - **Level 4:** Advanced early warning systems coordinated with emergency response in essential government services and lifelines
   - **Level 5:** Advanced early warning systems, integrated with preparedness and emergency response plans.

Dhka Power Distribution Company (DPDC)

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?
   - **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
   - **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
   - **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
   - **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
   - **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- What is the current state of information and warning systems implementation?
   - **Level 1:** No early warning system.
   - **Level 2:** Basic early warning systems available for decision-makers and risk managers
   - **Level 3:** Adequate early warning systems coupled with media announcements, reaching a majority of the population ahead of an event.
   - **Level 4:** Advanced early warning systems coordinated with emergency response in essential government services and lifelines
   - **Level 5:** Advanced early warning systems, integrated with preparedness and emergency response plans.

Titas Gas Transmission and Distribution Company Limited

1- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?
   - **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
   - **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
   - **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
   - **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
   - **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

2- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
   - **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
   - **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
   - **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
   - **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
   - **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

3- What is the current state of information and warning systems implementation?
   - **Level 1:** No early warning system.
   - **Level 2:** Basic early warning systems available for decision-makers and risk managers
   - **Level 3:** Adequate early warning systems coupled with media announcements, reaching a majority of the population ahead of an event.
   - **Level 4:** Advanced early warning systems coordinated with emergency response in essential government services and lifelines
   - **Level 5:** Advanced early warning systems, integrated with preparedness and emergency response plans.

Urban Development Directorate (UDD)

1- Does the community employ hazard-resistant livelihoods practices for food security?
   - **Level 1:** No hazard-resistant livelihoods practices are being employed in the community and there is food scarcity during certain periods of the year.
   - **Level 2:** Few community members employ hazard-resistant livelihoods practices but they are the exception.
   - **Level 3:** Some community members employ hazard-resistant livelihoods practices.
   - **Level 4:** Most community members employ hazard-resistant livelihoods practices.
   - **Level 5:** All community members employ hazard-resistant livelihoods practices and food supplies remain secure during emergencies as a result.

2- Do community members maintain good health and physical ability in normal times (through adequate food and nutrition, hygiene and health care) and have awareness on means to staying healthy and life-protecting measures?

- **Level 1:** Few community members maintain good health and physical ability in normal times and do not have awareness on staying healthy and life-protecting measures.
- **Level 2:** Some community members maintain good health and physical ability in normal times but have low awareness on staying healthy and life-protecting measures.
- **Level 3:** Most community members maintain good health and physical ability in normal times and have some awareness on staying healthy and life-protecting measures.
- **Level 4:** Most community members maintain good health and physical ability in normal times and have an adequate level of awareness on staying healthy and life-protecting measures.
- **Level 5:** All community members maintain good health and physical ability in normal times and have a high level of awareness on staying healthy and life-protecting measures.

3- Does the community have access to health care facilities and health workers equipped and trained to respond to physical and mental health consequences of disasters and lesser hazard events, and supported by access to emergency health services, medicines, etc.?

- **Level 1:** There is no one in the community trained or qualified to practice healthcare and there is no access to healthcare in the surrounding area.
- **Level 2:** There are occasional visits from trained community health workers and there is a healthcare facility but access is very difficult and/or quality of service is poor.
- **Level 3:** Trained community health workers consistently visit and there is access to a healthcare facility assisted by a trained auxiliary nurse; however, medicines and equipment are insufficient.
- **Level 4:** Trained community health workers consistently visit and there is an accessible healthcare facility with a physician and nurse, with the most essential equipment, medicines and referral mechanisms.
- **Level 5:** Trained community health workers consistently visit and there is an accessible healthcare facility completely equipped with all necessary staff, equipment and medicines for health care and referrals for emergencies.

4- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.
- Encouragement of more use of sustainable design and materials.

5- What is the current state of considering risks in land use and urban planning?
   - **Level 1:** Consideration of some means for identifying risk, and environmental protection in physical planning.
   - **Level 2:** Promulgation of some local regulations and legislation that consider hazards as a factor in development planning.
   - **Level 3:** Progressive formulation of land use regulations in the various cities that take into account hazards and risks.
   - **Level 4:** wide ranging formulation and updating for territorial plans with a preventive approach in the majority area of country or municipality.
   - **Level 5:** generalized approval and control of implementation of territorial organization plans that include risk analysis as major factor.

6- Is there any previously developed program for the implementation of the SEA in the field of (*Geology, Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)
   - Maintenance or improvement of the quality of soils/agricultural land.
   - Protection and enhancement of sites designated for their geological interest.
   - Maintenance and enhancement of soil function and health.
   - Using Previously Developed Land (PDL) to reduce the prevalence of derelict land.
   - Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
   - Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
   - Minimizing the loss of best and most versatile agricultural land.
   - Minimizing the conflict with existing land use patterns.
   - Minimizing land contamination.

7- Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?
   - **Level 1:** No community decision-making process around land use and planning.
   - **Level 2:** Community land use and planning does not consider hazard risks and vulnerabilities
   - **Level 3:** Community land use and planning considers hazard risks and vulnerabilities in the short-term.
   - **Level 4:** Community land use and planning considers hazard risks and vulnerabilities in the long-term (community land use plan if applicable).
   - **Level 5:** Community land use and planning which considers hazard risks and vulnerabilities in the long-term (local land development plan if applicable), which is supported by local authority/central government land use policy and planning.

8- What is the current state in coverage of vulnerability and risk analyses including analysis of exposed area, buildings and infrastructures?

- **Level 1:** Identification and mapping of the principle elements exposed in prone zones.
- **Level 2:** General studies of physical vulnerability when faced with the most recognized hazards, using GIS.
- **Level 3:** Evaluation of potential damage and loss scenarios for some hazard events. Analysis of the physical vulnerability of some essential buildings.
- **Level 4:** Detailed studies of risk using probabilistic techniques taking into account the economic and social impact of the majority of hazards in some regions. Vulnerability analysis for the majority of essential buildings and life lines.
- **Level 5:** Generalized evaluation of risk, considering physical, social, cultural and environmental factors. Vulnerability analysis also for private buildings and the majority of life lines.

9- Are the community's building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?

- **Level 1:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas and no hazard mitigation measures are being taken.
- **Level 2:** Majority of housing, critical infrastructure and basic services in the community are located in unsafe areas but some hazard mitigation measures are being taken.
- **Level 3:** Some housing, critical infrastructure and basic services in the community are located in unsafe areas and some hazard mitigation measures are being taken.
- **Level 4:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and some hazard mitigation measures are being taken for infrastructure in unsafe locations.
- **Level 5:** Majority of housing, critical infrastructure and basic services in the community are located in safe areas and those in unsafe locations are adequately protected, through hazard resistant construction and structural mitigation measures.

10- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

11- Is there any previously developed program for the implementation of the SEA in the field of (*Geology, Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Maintenance or improvement of the quality of soils/agricultural land.
- Protection and enhancement of sites designated for their geological interest.
- Maintenance and enhancement of soil function and health.
- Using Previously Developed Land (PDL) to reduce the prevalence of derelict land.
- Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
- Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
- Minimizing the loss of best and most versatile agricultural land.
- Minimizing the conflict with existing land use patterns.
- Minimizing land contamination.

12- Is there any previously developed program for the implementation of the SEA in the field of (*Air Quality and Climate*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing emissions of pollutant gases and particulates and enhance air quality.
- Reducing the need to travel and promote sustainable modes of transport.
- Reducing greenhouse gas emissions arising.
- Taking into account, and where possible adapt to, the potential effects of climate change to reduce vulnerability.
- Increasing the environmental resilience to the effects of climate change.

13- What is the current state of hazard mitigation works for the protection of human settlements and social investment?

- **Level 1:** Some structural control and stabilization measures in some prone-areas.
- **Level 2:** Effective structural defenses in exposed areas regarding relatively frequent events (more frequent than 50-year return period).
- **Level 3:** Establishment of measures and regulations for the design and construction of hazard control and protection works in harmony with national/county/municipality dictates.
- **Level 4:** Wide scale intervention in mitigation risk zones using protection and control measures.
- **Level 5:** Effective structural defenses and systematic approach to protecting livelihoods and assets from low frequency-high consequence events.

14- Does the community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?

- **Level 1:** The community has no access to formal or informal social protection schemes to support risk reduction.
- **Level 2:** Social cohesion within community provides informal social protection arrangements that support risk reduction at a small scale, but there is no access to formal mechanisms.
- **Level 3:** Community has limited (inconsistent) access to formal social protection schemes that only indirectly support risk reduction.
- **Level 4:** Community has access to formal social protection schemes that only indirectly support risk reduction.
- **Level 5:** Community has access to formal social protection schemes that both directly and indirectly support risk reduction.

15- Has the community carried out participatory hazard assessments, shared the findings and have human resources capable of conducting/updating these assessments?

- **Level 1:** Participatory hazard assessment and/or hazard mapping has never been carried out in a structured and participatory way in the community.
- **Level 2:** Participatory hazard assessment and/or hazard mapping has been carried out in the community, findings were not shared and the document/mapping is currently outdated or not in use.
- **Level 3:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use but findings have only been shared with some community members.
- **Level 4:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with most or all members of the community.
- **Level 5:** A participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with all members of the community; the community has human resources capable of conducting/updating this assessment/mapping.

16- Has the community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments?

- **Level 1:** A VCA has never been carried out in a structured and participatory way in the community.
- **Level 2:** A participatory VCA has been carried out in the community, but it is outdated and currently not in use**.**
- **Level 3:** A participatory VCA has been carried out but findings were not fully shared with the community.
- **Level 4:** A participatory VCA has been carried out and findings have been shared with most and/or all members of the community.
- **Level 5:** A participatory VCA has been carried out and findings have been shared with all members of the community; the community has human resources capable of conducting and monitoring the assessment.

Geological Survey of Bangladesh (GSB)

1- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.
- Encouragement of more use of sustainable design and materials.

2- Is there any previously developed program for the implementation of the SEA in the field of (*Geology, Land use and Soils*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Maintenance or improvement of the quality of soils/agricultural land.
- Protection and enhancement of sites designated for their geological interest.
- Maintenance and enhancement of soil function and health.
- Using Previously Developed Land (PDL) to reduce the prevalence of derelict land.
- Land Management for more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
- Ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.
- Minimizing the loss of best and most versatile agricultural land.
- Minimizing the conflict with existing land use patterns.
- Minimizing land contamination.

House Building & Research Institue (HBRI)

1- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)

- Minimizing the consumption of resources, including water and energy.
- Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- Promoting the re-use and recycling of waste materials
- Reducing leakage from the water supply system to help reduce demand for water.
- Encouragement of more efficient water use and consumption by consumers.
- Development of infrastructures that are energy efficient or using renewable energy sources.
- Reducing leakage from the supply network.
- Promoting the efficient use of energy and resources.
- Minimizing the demand for raw materials.
- Encouragement of more use of sustainable design and materials.

2- What is the current state of emergency plans establishment and accessibility to equipment and materials at emergency situations?

- **Level 1:** Fragmented organization and scattered resources for emergency response; predominance of voluntary responders.
- **Level 2:** Professional search and rescue services, evacuation possibilities, temporary shelters and central operations centers available in the most hazard-prone areas.
- **Level 3:** Existence of a national organization of emergency response with coordination authority; adequate supplies of medical, transport, communications and other specialized equipment in all important cities and densely populated areas, as well as in emergency situations.
- **Level 4:** Clear definition of roles and responsibilities at local, regional and national levels; proportionate allocation of resources.
- **Level 5:** Permanent coordination between responders in national agencies, local government, NGOs and communities. Specialized equipment and well-trained rescue services available throughout the country.

3- What is the current state of obligatory retrofitting of principal public and private buildings and implementation of programs of fiscal incentives for housing rehabilitation?
   - **Level 1:** Retrofitting and sporadic adjustments to buildings and life lines.
   - **Level 2:** Promulgation of intervention norms with regards to the vulnerability of existing buildings. Strengthening of essential buildings such as hospitals or those considered indispensable.
   - **Level 3:** Some mass programs for evaluating vulnerability, rehabilitation and retrofitting of hospitals, schools, and the central offices of life line facilities. Obligatory nature of retrofitting.
   - **Level 4:** Progressive number of buildings retrofitted, life lines intervened, some buildings of the private sector retrofitted autonomously or initiated by fiscal incentives from the government.
   - **Level 5:** Massive retrofitting of principal public and private buildings. Permanent programs of incentives for housing rehabilitation.

4- What is the current state of housing improvement works and implementation of relocation program of housing in prone-areas / non mitigable risk zones?
   - **Level 1:** Identification and inventory of a few of human settlements located in hazard prone areas.
   - **Level 2:** Promulgation of legislation which establishes the priority of dealing with hazard risk in deteriorated urban areas.
   - **Level 3:** Programs for upgrading the surroundings, existing housing, and relocation from prone areas in the most critical areas.
   - **Level 4:** Progressive intervention of human settlements in hazard prone areas in the majority of regions/areas and adequate treatment of the cleared areas.
   - **Level 5:** Notable control of hazard prone areas in the country/county and relocation of the majority of housing constructed in non mitigable risk zones.

5- Is there any previously developed program for the implementation of the SEA in the field of (*Material Assets and Resource*) by your organization as plans or procedures within any of these frameworks: as (*If "No" please describe reasons, restrictions and future plans*)
   - Minimizing the consumption of resources, including water and energy.
   - Reducing the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
   - Promoting the re-use and recycling of waste materials
   - Reducing leakage from the water supply system to help reduce demand for water.
   - Encouragement of more efficient water use and consumption by consumers.
   - Development of infrastructures that are energy efficient or using renewable energy sources.
   - Reducing leakage from the supply network.
   - Promoting the efficient use of energy and resources.
   - Minimizing the demand for raw materials.
   - Encouragement of more use of sustainable design and materials.

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- **Level 1:** Identification and inventory of a few of human settlements located in hazard prone areas.
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- **Level 4:** Progressive intervention of human settlements in hazard prone areas in the majority of regions/areas and adequate treatment of the cleared areas.
- **Level 5:** Notable control of hazard prone areas in the country/county and relocation of the majority of housing constructed in non mitigable risk zones.

8- Does the community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?

- **Level 1:** The community has no access to formal or informal social protection schemes to support risk reduction.
- **Level 2:** Social cohesion within community provides informal social protection arrangements that support risk reduction at a small scale, but there is no access to formal mechanisms.
- **Level 3:** Community has limited (inconsistent) access to formal social protection schemes that only indirectly support risk reduction.
- **Level 4:** Community has access to formal social protection schemes that only indirectly support risk reduction.
- **Level 5:** Community has access to formal social protection schemes that both directly and indirectly support risk reduction.

BUET Department of Urban & Regional Planning

1- Does the community use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods?
   - **Level 1:** Community has little or no local knowledge or perceptions of risk or scientific data and analysis (e.g. in the case of refugee camp or recent unplanned urbanization).
   - **Level 2:** Community has some risk awareness based on local knowledge and perceptions of risk but this is not supported by scientific data or analysis.
   - **Level 3:** Community has medium level of risk awareness based on local knowledge and perceptions of risk which is supported by one-off or piecemeal scientific data or analysis.
   - **Level 4:** Community has high level of risk awareness based on local knowledge and perceptions of risk which is supported by longer term and more numerous scientific data or analysis.
   - **Level 5:** Community has high level of risk awareness based on local knowledge and perceptions of risk which is reinforced by comprehensive scientific data and analysis as part of a long-term strategy for risk awareness.

2- What is the current state of wide ranging production of teaching materials, permanent schemes for community training, and provision of community training and education in hazards and disaster risk management?
   - **Level 1:** Incipient incorporation of topics about hazards and risk management in formal education and programs for community participation.
   - **Level 2:** Production of teaching guides in hazards and risk management for teachers and community leaders in some places.
   - **Level 3:** widening of curricular reform to higher education programs to include hazards and risk management. Specialization courses offered at various universities. Considerable production of teaching materials and undertaking of frequent courses for community training.
   - **Level 4:** As significant and progressive incorporation of disaster risk management in primary and secondary curricula.
   - **Level 5:** High technical capacity in the country/county/municipality to generate risk knowledge. Generalized curricular reform throughout the territory and in all stages of education.

3- Does the community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?
   - **Level 1:** The community has no access to formal or informal social protection schemes to support risk reduction.
   - **Level 2:** Social cohesion within community provides informal social protection arrangements that support risk reduction at a small scale, but there is no access to formal mechanisms.
   - **Level 3:** Community has limited (inconsistent) access to formal social protection schemes that only indirectly support risk reduction.
   - **Level 4:** Community has access to formal social protection schemes that only indirectly support risk reduction.
   - **Level 5:** Community has access to formal social protection schemes that both directly and indirectly support risk reduction.

4- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?
   - **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
   - **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
   - **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
   - **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
   - **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

5- Do education services have the capacity to continue their operation without interruption during emergencies?
   - **Level 1:** School frequently impacted (at least once a year) by disasters and shocks that result in suspension of school activities. School does not have a safety plan or emergency committee.
   - **Level 2:** School impacted at least once every 5 years by disasters and shocks that result in suspension of school activities. Interruptions generally last for more than a month before activities are resumed. School does not have a safety plan or emergency committee.
   - **Level 3:** School impacted at least once every 5 years by disasters and shocks that result in suspension of school activities. Interruptions last less than one month before activities are resumed. A school safety plan is in place and some of the preparedness measures identified have been implemented. A school emergency committee has been formed but it does not perform simulation drills.
   - **Level 4:** School impacted at least once every 10 years by disasters and shocks that result in suspension of school activities. Interruptions are generally less than one week before activities are resumed. A school safety plan is in place and most of the preparedness measures identified have been implemented. A school emergency committee is in place and at least one simulation drill has been performed in the last school year.
   - **Level 5:** School's operation rarely impacted by emergencies (or impacts result in minimum disruption to school activities), a school safety plan is in place and most of the preparedness

measures have been implemented. A school emergency committee is in place and regularly performs simulation drills and reviews/updates the school safety plan.

Department of Health

1- Does the community employ hazard-resistant livelihoods practices for food security?
- **Level 1:** No hazard-resistant livelihoods practices are being employed in the community and there is food scarcity during certain periods of the year.
- **Level 2:** Few community members employ hazard-resistant livelihoods practices but they are the exception.
- **Level 3:** Some community members employ hazard-resistant livelihoods practices.
- **Level 4:** Most community members employ hazard-resistant livelihoods practices.
- **Level 5:** All community members employ hazard-resistant livelihoods practices and food supplies remain secure during emergencies as a result.

2- Do community members maintain good health and physical ability in normal times (through adequate food and nutrition, hygiene and health care) and have awareness on means to staying healthy and life-protecting measures?
- **Level 1:** Few community members maintain good health and physical ability in normal times and do not have awareness on staying healthy and life-protecting measures.
- **Level 2:** Some community members maintain good health and physical ability in normal times but have low awareness on staying healthy and life-protecting measures.
- **Level 3:** Most community members maintain good health and physical ability in normal times and have some awareness on staying healthy and life-protecting measures.
- **Level 4:** Most community members maintain good health and physical ability in normal times and have an adequate level of awareness on staying healthy and life-protecting measures.
- **Level 5:** All community members maintain good health and physical ability in normal times and have a high level of awareness on staying healthy and life-protecting measures.

3- Does the community have access to health care facilities and health workers equipped and trained to respond to physical and mental health consequences of disasters and lesser hazard events, and supported by access to emergency health services, medicines, etc.?
- **Level 1:** There is no one in the community trained or qualified to practice healthcare and there is no access to healthcare in the surrounding area.
- **Level 2:** There are occasional visits from trained community health workers and there is a healthcare facility available but access is very difficult and/or quality of service is poor.
- **Level 3:** Trained community health workers consistently visit and there is access to a healthcare facility assisted by a trained auxiliary nurse; however, medicines and equipment are insufficient.
- **Level 4:** Trained community health workers consistently visit and there is an accessible healthcare facility with a physician and nurse, with the most essential equipment, medicines and referral mechanisms.
- **Level 5:** Trained community health workers consistently visit and there is an accessible healthcare facility completely equipped with all necessary staff, equipment and medicines for health care and referrals for emergencies.

4- Does the community take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs?
   - **Level 1:** Community has a mainly passive role in response and recovery actions.
   - **Level 2:** Community usually plays an active role in response and recovery actions, but these actions do not prioritize need and reach only few of the affected community members.
   - **Level 3:** Community usually plays a leading role in response and recovery actions that can reach most affected community members, but the needs of vulnerable groups are still not prioritized.
   - **Level 4:** Community always plays a leading role in response and recovery actions, reaches most of the affected members in the community and prioritizes the needs of some vulnerable groups.
   - **Level 5:** Community always plays a leading role in response and recovery actions, which can reach all of its affected members and needs of all vulnerable groups are prioritized and met.

5- What is the current state of emergency plans establishment and accessibility to equipment and materials at emergency situations?
   - **Level 1:** Fragmented organization and scattered resources for emergency response; predominance of voluntary responders.
   - **Level 2:** Professional search and rescue services, evacuation possibilities, temporary shelters and central operations centers available in the most hazard-prone areas.
   - **Level 3:** Existence of a national organization of emergency response with coordination authority; adequate supplies of medical, transport, communications and other specialized equipment in all important cities and densely populated areas, as well as in emergency situations.
   - **Level 4:** Clear definition of roles and responsibilities at local, regional and national levels; proportionate allocation of resources.
   - **Level 5:** Permanent coordination between responders in national agencies, local government, NGOs and communities. Specialized equipment and well-trained rescue services available throughout the country.

6- Does the community use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?
   - **Level 1:** Community has no contingency plan.
   - **Level 2:** Community has a contingency plan but this was not prepared in a participatory way, nor does it take into account the needs of vulnerable groups. Few community members know its content and it is currently not being applied.
   - **Level 3:** Community has a contingency plan that was prepared in a participatory way that takes into account the needs of some vulnerable groups. Some community members know its content but it is only occasionally applied and updated.
   - **Level 4:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account the needs of most vulnerable groups; most community members know its content however it is only occasionally applied and updated.
   - **Level 5:** Community has a contingency plan, developed in a participatory and inclusive manner that takes into account needs of most vulnerable groups; majority of community members know its content and it is regularly applied and updated.

7- Are emergency shelters (purpose built or modified) accessible to community and with adequate facilities for all affected population?

- **Level 1:** All of community housing is unsafe for any emergency (small-scale and large-scale) and there is no physical space to evacuate to.
- **Level 2:** In small scale emergencies, community members can house themselves in homes of relatives or neighbors in more secure conditions or using school buildings, but there is no other community building to function as an evacuation shelter.
- **Level 3:** Additional to the homes of relatives and neighbors, the community has a structure (community center or other community building other than schools) that can serve as a shelter in emergencies but its facilities are inadequate to meet the basic needs of all affected persons.
- **Level 4:** Additional to the homes of relatives and neighbors, the community has a structure (community center or other community building other than schools) that serves as a shelter with adequate conditions to meet the basic needs of affected persons in emergencies.
- **Level 5:** Additional to the homes of relatives and neighbors, the community has a purpose built emergency shelter in optimal conditions to meet all basic needs of affected persons and also to protect vulnerable groups in emergencies.

8- Are the vulnerable groups in the community included/represented in community decision making and management of DDR?

- **Level 1:** Vulnerable groups never participate in decision-making on DRR.
- **Level 2:** Some vulnerable groups occasionally participate/are represented in community decision-making on DRR, but usually as part of wider community meetings and do not occupy positions in the main decision-making body.
- **Level 3:** Some vulnerable groups participate/are represented regularly in decision-making meetings and in the decision-making body but do not occupy leadership positions.
- **Level 4:** Most vulnerable groups regularly participate/are represented in decision-making meetings and some occupy leadership positions in the DRR decision-making body.
- **Level 5:** All vulnerable groups regularly participate in decision-making/ are represented at meetings and some occupy leadership positions in the decision-making body.

9- Is DRR seen by the community as an integral part of plans and actions to achieve wider community goals (e.g., poverty alleviation, quality of life)?

- **Level 1:** The community does not see DRR as an integral part of plans and actions to achieve wider community goals.
- **Level 2:** Community sees importance of DRR for achieving wider community goals, but this is not documented in their local development plan.
- **Level 3:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are not used or outdated.
- **Level 4:** Community sees importance of DRR for achieving wider community goals and has documented DRR actions within local plans to achieve wider development goals but these are only occasionally applied.
- **Level 5:** Community sees DRR as an integral part of plans and actions to achieve wider community goals and these are regularly acted upon.

Urban Resilience Project

1- Is there a high level of community volunteerism in all aspects of preparedness, response and recovery; representative of all sections of community?
   - **Level 1:** There is very low to negligible level of community volunteerism in aspects of preparedness, response and recovery and there is no adherence to relevant protocol.
   - **Level 2:** There is some level of community volunteerism but not in all aspects of preparedness, response and recovery, and it is not representative of all sections of the community and there is no adherence to relevant protocol.
   - **Level 3:** There is high level of community volunteerism but not in all aspects of preparedness, response and recovery and it is not representative of all sections of the community, with limited adherence to relevant protocol.
   - **Level 4:** There is a high level of community volunteerism in all aspects of preparedness, response and recovery, but still is not representative of all sections of the community, with limited adherence to relevant protocol.
   - **Level 5:** There is a high level of community volunteerism in all aspects of preparedness, response and recovery, which is representative of all sections of the community, with full adherence to relevant protocol.

2- What is the current state of coordination between public, private and community based bodies for response in case of emergencies and testing frequency of contingency plans and updating frequency for operational procedures?
   - **Level 1:** Continuity plans do not exist or are not operational (no trained personnel, no updating, etc.).
   - **Level 2:** Basic contingency plans are in place in ministries, large hospitals, public utilities, large municipalities, and major corporations.
   - **Level 3:** Legal requirements and/or incentive mechanisms (e.g. use of certification) for public and private organizations to adopt extensive preparedness and continuity plans.
   - **Level 4:** Some coordination of continuity plans among ministries, local authorities and operators of lifelines; occasional joint simulation exercises.
   - **Level 5:** Widespread emergency preparedness and continuity planning in public and private organizations; frequent updating of plans in larger organizations based on the results of joint exercises.

3- What is the current state of popularization and frequency of training program on emergency response among the community and in coordination with other organizations and NGOs?

- **Level 1:** Occasional informative meetings with community in order to illustrate emergency procedures during disasters.
- **Level 2:** Sporadic training courses with civil society organizations dealing with disaster related themes.
- **Level 3:** Community training activities are regularly programmed on emergency response in coordination with community development organizations and NGOs.
- **Level 4:** Courses on preparedness, prevention and reduction of risk are run frequently with communities in the majority of cities and municipalities.
- **Level 5:** Permanent prevention and disaster response courses in all municipalities in coordination with other organizations and NGOs.

4- Does the community have a trained and operating organization in disaster preparedness and response?

- **Level 1:** The community does not have a trained organization responsible for emergency preparedness and response.
- **Level 2:** There is a community organization responsible for emergency preparedness and response but only some of its members have been formally trained in DRR skills and its operational capacity is weak.
- **Level 3:** There is a community organization responsible for emergency preparedness and response and its members have been trained in DRR skills but it only operates in emergencies.
- **Level 4:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members and carries out preparedness activities and response in emergencies.
- **Level 5:** There is a fully trained community organization responsible for emergency preparedness and response, which cascades training to other community members, performs prevention, preparedness, response and recovery and effectively coordinates with external agencies.

5- Does the community employ hazard-resistant livelihoods practices for food security?

- **Level 1:** No hazard-resistant livelihoods practices are being employed in the community and there is food scarcity during certain periods of the year.
- **Level 2:** Few community members employ hazard-resistant livelihoods practices but they are the exception.
- **Level 3:** Some community members employ hazard-resistant livelihoods practices.
- **Level 4:** Most community members employ hazard-resistant livelihoods practices.
- **Level 5:** All community members employ hazard-resistant livelihoods practices and food supplies remain secure during emergencies as a result.

6- Do community members maintain good health and physical ability in normal times (through adequate food and nutrition, hygiene and health care) and have awareness on means to staying healthy and life-protecting measures?

- **Level 1:** Few community members maintain good health and physical ability in normal times and do not have awareness on staying healthy and life-protecting measures.
- **Level 2:** Some community members maintain good health and physical ability in normal times but have low awareness on staying healthy and life-protecting measures.
- **Level 3:** Most community members maintain good health and physical ability in normal times and have some awareness on staying healthy and life-protecting measures.
- **Level 4:** Most community members maintain good health and physical ability in normal times and have an adequate level of awareness on staying healthy and life-protecting measures.
- **Level 5:** All community members maintain good health and physical ability in normal times and have a high level of awareness on staying healthy and life-protecting measures.

7- Does the community have access to health care facilities and health workers equipped and trained to respond to physical and mental health consequences of disasters and lesser hazard events, and supported by access to emergency health services, medicines, etc.?

- **Level 1:** There is no one in the community trained or qualified to practice healthcare and there is no access to healthcare in the surrounding area.
- **Level 2:** There are occasional visits from trained community health workers and there is a healthcare facility available but access is very difficult and/or quality of service is poor.
- **Level 3:** Trained community health workers consistently visit and there is access to a healthcare facility assisted by a trained auxiliary nurse; however, medicines and equipment are insufficient.
- **Level 4:** Trained community health workers consistently visit and there is an accessible healthcare facility with a physician and nurse, with the most essential equipment, medicines and referral mechanisms.
- **Level 5:** Trained community health workers consistently visit and there is an accessible healthcare facility completely equipped with all necessary staff, equipment and medicines for health care and referrals for emergencies.

8- Has the community carried out participatory hazard assessments, shared the findings and have human resources capable of conducting/updating these assessments?

- **Level 1:** Participatory hazard assessment and/or hazard mapping has never been carried out in a structured and participatory way in the community.
- **Level 2:** Participatory hazard assessment and/or hazard mapping has been carried out in the community, findings were not shared and the document/mapping is currently outdated or not in use.
- **Level 3:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use but findings have only been shared with some community members.
- **Level 4:** Participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with most or all members of the community.
- **Level 5:** A participatory hazard assessment and/or hazard mapping has been carried out, is currently in use and findings have been shared with all members of the community; the community has human resources capable of conducting/updating this assessment/mapping.

9- Has the community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments?

- **Level 1:** A VCA has never been carried out in a structured and participatory way in the community.
- **Level 2:** A participatory VCA has been carried out in the community, but it is outdated and currently not in use**.**
- **Level 3:** A participatory VCA has been carried out but findings were not fully shared with the community.
- **Level 4:** A participatory VCA has been carried out and findings have been shared with most and/or all members of the community.
- **Level 5:** A participatory VCA has been carried out and findings have been shared with all members of the community; the community has human resources capable of conducting and monitoring the assessment.

Annex C. TERMS OF REFERENCE FOR (PWG) PROJECT WORKING GROUP

TERMS OF REFERENCE FOR (PWG) PROJECT WORKING GROUP

In recent years, Bangladesh has reformed its approach to cyclone and flood risk management and preparedness. Triggered by major loss of life and assets, notably during the cyclones of 1970 and 1991 that killed over 300,000 and 140,000 people respectively, the Government of Bangladesh (GoB), civil society, and international development partners have demonstrated that investment in the systems and structures of flood risk management and cyclone preparedness saves lives, reduces economic loss, and protects development gains. As such, Bangladesh is cited often in the rationale for investment in disaster risk management (DRM) activities globally.

The threat of an earthquake, however, is less visible but significant given that Bangladesh lies on the seismically active Indian plate. Inertia has slowed earthquake awareness because these events occur less regularly and are currently relatively absent from the living memory of the country's inhabitants and leaders. Studies by the Geological Survey of Bangladesh divide the country into three seismic zones, which show that earthquake risk is medium to high throughout the country and increases towards the north and east of the country. Although there is some uncertainty, research suggests that an earthquake of up to magnitude 7.5 is possible, and the nearest fault line runs just 60km from the nation's capital.

A National Plan on Disaster Management (2010-2015) includes an Earthquake Management Plan and a National Earthquake Contingency Plan, which have been developed under the Ministry of Food and Disaster Management. These plans identify response and risk reduction activities with corresponding lead and support agencies. However, the plans lack the comprehensive vision of a national earthquake strategy, and a convincing demonstration of benefits, implementation, and controls. Furthermore, the institutional structure for multi-stakeholder engagement to deal with a problem as complex as urban earthquake risk is also lacking and the existing plans do not engage agencies and organizations in a sustainable way.

To respond to this critical gap in the management of disaster risk in Bangladesh, this project represents the second phase of a multi-phase national DRM program to build institutional capacity to mitigate the impact of earthquakes, cyclone, and floods in the rapidly urbanizing cities of Bangladesh. The objective of the overall engagement is to

develop a comprehensive approach to managing disaster risk through a structured process of knowledge development, education, and planning that involves a wide range of stakeholders to increase engagement and ownership to reach building inclusive, resilient, sustainable and prosperous urban communities. Government planners and private professionals need to be trained in risk-sensitive land use planning (RSLUP). At the same time, the land use planning system needs to be updated to become risk sensitive. This translates into a new framework for a national integrated plan that includes:

7. Risk-sensitive land use planning from their formulation, implementation and enforcement perspective;
8. Mainstreaming risk management and reduction parameters and objectives in land use plans from their formulation to their implementation and enforcement;
9. Identifying and quantifying natural hazards (e.g., flood, earthquake, extreme winds, etc.) and related risk parameters in the planning methodology;
10. Formulate a vision for a disaster resilient city and develop a risk profile and disaster risk reduction objectives;
11. Reaching consensus with stakeholders on planning criteria and zoning requirements derived from the RSLUP process; and
12. Embarked on efforts to prepare and enforce risk-sensitive land use plans in Bangladesh to reach planning that integrates risk reduction, to allow communities to find the right mix of both development and risk reduction,

1. PROJECT WORKING GROUP (PWG)

1.1. Membership

The Project Working Group shall be determined by PIU. The list of names of group members, including their titles, telephone no and e-mail addresses will be determined by PIU[11].

The 2. PROJECT WORKING GROUP (PWG) is composed of the members listed below as main name of the stakeholders:

#	Name of the Stakeholder	Stakeholder Key Person Position	PWG Position
1	Ministry of Disaster Management & Relief	1	Member

[11] Additional members may be included in the group as required.

2	Infrastructure Division, Planning Commission	2	Member
3	Programming Division, Planning Commission	2	Member
4	Rajdhani Unnayan Kartripakkha (RAJUK)	**1**	Member
5	Public Works Department (PWD)	1	Member
6	Local Government Engineering Department (LGED)	2	Member
7	Department of Environment (DoE)	2	Member
8	Department of Disaster Management (DDM)	1	Member
9	Bangladesh Meteorological Department (BMD)	2	Member
10	Education Engineering Department	1	Member
11	Fire Service & Civil Defense (FSCD)	1	Member
12	Dhaka Transport Co-ordination Authority (DTCA)	2	Member
13	Dhaka Water Supply and Sewage Authority (DWASA)	2	Member
14	Civil Aviation Authority (CAA)	2	Member
15	Dhaka Electric Supply Company (DESCO)	2	Member
16	Dhaka Power Distribution Company (DPDC)	2	Member
17	Titas Gas Transmission and Distribution Company Limited	2	Member
18	Urban Development Directorate (UDD)	1	Member
19	Geological Survey of Bangladesh (GSB)	1	Member
20	House Building & Research Institute (HBRI)	2	Member
21	BUET Department of Urban & Regional Planning	1	Member
22	Dhaka North City Corporation (DNCC)	2	Member
23	Dhaka South City Corporation (DSCC)	2	Member
24	BUET Department of Urban & Regional Planning	1	Member
25	NKY-PROTEK-SHELTECH-SDE JV	Team Leader	Chair

1 = Core group
2= Ad hock

1.2. Chair

The group will be chaired by the Consultant's Team Leader. The Team Leader will be supported by a secretary assigned by himself.

1.3. Agenda items

The agenda, with attached meeting papers, will be distributed at least five working days prior to the next scheduled meeting.

1.4. Minutes and meeting papers

The minutes of each (PWG) Project Working Group meeting will be prepared by the Consultant's Project Manager and secretary.
Full copies of the minutes, including attachments, action points, and owners, will be provided to all Project Working Group members no later than seven working days following each meeting.
By agreement of the group, out-of-session decisions will be deemed acceptable. Where agreed, all out-of-session decisions will be recorded in the minutes of the next scheduled meeting.
Members will be invited to contribute items to the agenda if they wish.

1.5. Frequency of meetings

The (PWG) Project Working Group will meet at least every three months. When a meeting is required earlier, the Team Leader of the Consultant will inform the PWG members at least 5 working days before the meeting date.

1.6. Proxies to meetings

Members of the Project Working Group may nominate a proxy to attend a meeting if the member is unable to attend.
The Chair will be informed of the substitution at least five working days prior to the scheduled nominated meeting.

The nominated proxy will provide relevant comments/feedback about the attended meeting to the Project Working Group member they are representing.

2. ROLES AND FUNCTIONS OF PWG

Roles and functions of the Project Working Group include:

- Data collection
- Data validation
- Assumption confirmation
- Feedback
- Conflict resolution and consensus development
- Act as a mechanism for sharing knowledge
- Act as a mechanism for building capacity
- Act as a mechanism for developing sustainability
- Can be used as a platform for workshops and training

3. ROLE OF INDIVIDUAL MEMBERS OF THE PWG

The role of the individual members of the Project Working Group includes:

- attending regular meetings as required and actively participating in the group's work
- representing the interests of his organization as appropriate
- a genuine interest in the initiatives and the outcomes being pursued in the program
- being an advocate for the program's outcomes
- being committed to, and actively involved in, pursuing the program's outcomes
- Serve as the conduit through which information about the project is communicated to colleagues
- Contribute to the project's Communications Plan, e.g. by participating in system demonstrations, briefing sessions, etc.
- The Project Oversight Committee will be led by PIU Director.

Annex D. TERMS OF REFERENCE FOR (POC) PROJECT OVERSIGHT COMMITTEE

TERMS OF REFERENCE FOR (POC) PROJECT OVERSIGHT COMMITTEE

1. Introduction

In recent years, Bangladesh has reformed its approach to cyclone and flood risk management and preparedness. Triggered by major loss of life and assets, notably during the cyclones of 1970 and 1991 that killed over 300,000 and 140,000 people respectively, the Government of Bangladesh (GoB), civil society, and international development partners have demonstrated that investment in the systems and structures of flood risk management and cyclone preparedness saves lives, reduces economic loss, and protects development gains. As such, Bangladesh is cited often in the rationale for investment in disaster risk management (DRM) activities globally.

The threat of an earthquake, however, is less visible but significant given that Bangladesh lies on the seismically active Indian plate. Inertia has slowed earthquake awareness because these events occur less regularly and are currently relatively absent from the living memory of the country's inhabitants and leaders. Studies by the Geological Survey of Bangladesh divide the country into three seismic zones, which show that earthquake risk is medium to high throughout the country and increases towards the north and east of the country. Although there is some uncertainty, research suggests that an earthquake of up to magnitude 7.5 is possible, and the nearest fault line runs just 60km from the nation's capital.

A National Plan on Disaster Management (2010-2015) includes an Earthquake Management Plan and a National Earthquake Contingency Plan, which have been developed under the Ministry of Food and Disaster Management. These plans identify response and risk reduction activities with corresponding lead and support agencies. However, the plans lack the comprehensive vision of a national earthquake strategy, and a convincing demonstration of benefits, implementation, and controls. Furthermore, the institutional structure for multi-stakeholder engagement to deal with a problem as complex

as urban earthquake risk is also lacking and the existing plans do not engage agencies and organizations in a sustainable way.

To respond to this critical gap in the management of disaster risk in Bangladesh, this project represents the second phase of a multi-phase national DRM program to build institutional capacity to mitigate the impact of earthquakes, cyclone, and floods in the rapidly urbanizing cities of Bangladesh. The objective of the overall engagement is to develop a comprehensive approach to managing disaster risk through a structured process of knowledge development, education, and planning that involves a wide range of stakeholders to increase engagement and ownership to reach building inclusive, resilient, sustainable and prosperous urban communities. Government planners and private professionals need to be trained in risk-sensitive land use planning (RSLUP). At the same time, the land use planning system needs to be updated to become risk sensitive. This translates into a new framework for a national integrated plan that includes:

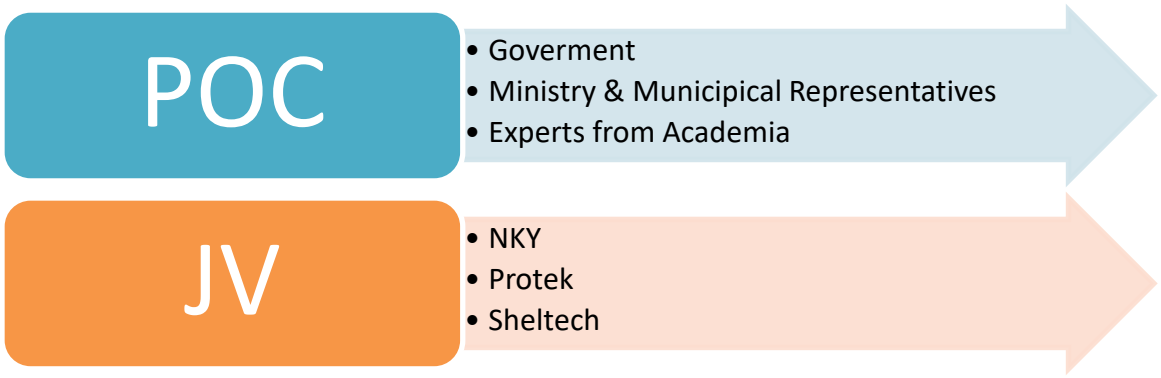
13. Risk-sensitive land use planning from their formulation, implementation and enforcement perspective;
14. Mainstreaming risk management and reduction parameters and objectives in land use plans from their formulation to their implementation and enforcement;
15. Identifying and quantifying natural hazards (e.g., flood, earthquake, extreme winds, etc.) and related risk parameters in the planning methodology;
16. Formulate a vision for a disaster resilient city and develop a risk profile and disaster risk reduction objectives;
17. Reaching consensus with stakeholders on planning criteria and zoning requirements derived from the RSLUP process; and
18. Embarked on efforts to prepare and enforce risk-sensitive land use plans in Bangladesh to reach planning that integrates risk reduction, to allow communities to find the right mix of both development and risk reduction,

2. THE PROJECT OVERSIGHT COMMITTEE (POC)

The Project Oversight Committee (POC) serves as the governing body of the Risk Sensitive Land Use Planning project and will provide direction, guidance, and leadership in ensuring the effective implementation of the project and effectiveness of the activities. POC meets at least every three months to:

i) review and approve the project work plan and
ii) review progress and achievements, making adjustments if necessary.

Meetings can be face-to-face or virtual, depending on circumstances.



2.1. 2.1. MEMBERS OF POC

The Project Oversight Committee (POC) is composed of the members listed below as main name of the stakeholders:

#	Name of the Stakeholder	Stakeholder Key Person Position	POC Position
1	Ministry of Disaster Management & Relief	Secretary	Member
2	Infrastructure Division, Planning Commission	Secretary	Member
3	**Rajdhani Unnayan Kartripakkha (RAJUK)**	**Chairman**	**Chair**
4	Department of Environment (DoE)	Director General	Member
5	Department of Disaster Management (DDM)	Director General	Member
6	Dhaka Water Supply and Sewage Authority (DWASA)	Managing Director	Member
7	Geological Survey of Bangladesh (GSB)	Director	Member

3. RESPONSIBILITIES OF POC

1. Provide guidance and oversee the development of the overall RSLUP work plan and its effective implementation,
2. Review and validate annual work plans and budgets submitted by the project management team, before submission to the WB (World Bank),
3. Ensure that the project is implemented by the relevant partners and institutions assigned, in line with the signed agreement between the Government of Bangladesh and the World Bank (WB),
4. Oversee and review of budget and contractual issues,

5. Ensure that the resources available to the project are used as effectively as possible to achieve the project objectives and expected results,
6. Evaluate risks associated with the project and identify plans/actions to mitigate the risks
7. Provide advice to promote effective linkages with institutions and organizations at the national and global level, including with the policy roundtable discussions, to further the overall objectives of the project and attract additional resources.
8. Hold meetings at least two times a year in an agreed location and most appropriate timing.
9. Contribute to the implementation of the project communication and visibility strategy.
10. The Project Oversight Committee will be led by PIU Director.

4. CHAIR

The Project Oversight Committee will be led by Chairman, RAJUK.

5. FREQUENCY OF MEETING

POC meets at least once every three months. Meetings will be held at least four times a year in an agreed location and most appropriate timing. POC will also meet after each submission of deliverables of Consultant.

6. PROXIES TO MEETINGS

Members of the Project Oversight Committee may nominate a proxy to attend a meeting if the member is unable to attend.

The Chair will be informed of the substitution at least five working days prior to the scheduled nominated meeting.

The nominated proxy will provide relevant comments/feedback about the attended meeting to the Project Oversight Committee member they are representing.
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