

# ENVIRONMENTAL MANAGEMENT FRAMEWORK



Competitive and Livable City of Karachi (CLICK)

**DRAFT**

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**Local Government Department**

**Government of Sindh**

## ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	Microgram per Cubic Meter
BOD <sub>5</sub>	Biochemical Oxygen Demand (for 5 day)
BOT	Build Operate Transfer
CBOs	Community Based Organizations
CCMR	Community Complaints Management Register
CCP	Climate Change Policy
CDM	Clean Development Mechanism
CETP	Combined Effluent Treatment Plant
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
COD	Chemical Oxygen Demand
CPEMP	Construction Phase Environmental Management Plan
dBA	A Weighted Decibels
EA	Environmental Assessment
ED	Executive Director
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESC	Environment and Social Cell
FGDs	Focused Group Discussions
FI	Financial Intermediary
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GIS	Geographical Information System
GRC	Grievance Redress Cell
GRM	Grievance Redress Mechanism
GRR	Grievance Redress Report
HC	Hydrocarbon
HR	Human Resource
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEE	Initial Environmental Examination
IEPS	Initial Executive Project Summary
IFI	International Financing Institution
Km	Kilometer
km <sup>2</sup>	Square Kilometer
KMC	Karachi Metropolitan Corporation
KSDP	Karachi Strategic Development Plan
KWSB	Karachi Water and Sewerage Board
LC	Local Council
MDGs	Millennium Development Goals
MG	Million Gallon

MGD	Million Gallons per Day
Mm	Millimeter
MP	Mitigation Plan
NEQS	National Environmental Quality Standards
NGOs	Non-Governmental Organizations
NOC	No Objection Certificate
NOx	Oxides of Nitrogen
NRW	Non-Revenue Water
O&M	Operation and Maintenance
°C	Degree Celsius
OED	Operations Evaluation Department
OP	Operational Policy
PCR	Project Completion Report
PCRs	Physical Cultural Resources
PDOs	Project Development Objectives
PGA	Peak Ground Acceleration
PKR	Pak Rupee
PM <sub>10</sub>	Particulate Matter of 10 micrometer Diameter Particle Size
PM <sub>2.5</sub>	Particulate Matter of 2.5 micrometer Diameter Particle Size
PMU	Project Management Unit
PPIAF	The Public Private Infrastructure Advisory Facility
PPP	Public Private Partnership
PR	President's Report
PSHA	Probabilistic Seismic Hazard Assessment
RED	Regional Environmental Division
REDD	Reducing Emissions from Deforestation and Forest Degradation
RO	Reverse Osmosis
SAR	Staff Appraisal Report
SDS	Safety Data Sheet
SEPA	Sindh Environmental Protection Agency
SEQS	Sindh Environmental Quality Standards
SME	Small and Medium Enterprise
SPDB	Sindh Planning and Development Board
STC	Short Term Consultant
TDS	Total Dissolved Solids
TM	Task Manager
TMP	Traffic Management Plan
TORs	Terms of References
TPP	Tree Plantation Plan
TPV	Third Party Validation
TSP	Total Suspended Particulates
US EPA	United States Environmental Protection Agency
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

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## EXECUTIVE SUMMARY

### Background

Karachi is Pakistan's largest city, its economic and financial hub and main seaport. It contributes an estimated 15 percent of national GDP and the largest share of national tax revenues, industrial employment, manufacturing and high-end services<sup>1</sup>. With an estimated population of 16 million<sup>2</sup>, Karachi also dominates the economic and demographic landscape of Sindh and is the capital of the province. It has one-third of Sindh's total population, nearly all of its industrial and service economy and a majority of its labor force. It has the potential to be a catalyst and engine of economic growth for the country due to its size, location existing base of industrial and human capital. It is also among the world's least livable cities. The city ranks in the bottom five cities (out of 140), performing poorly in the dimensions of livability, health, environment, safety and education.<sup>3</sup>

Karachi is the financial capital of Pakistan and plays a pivotal role in economic and industrial activities. Karachi being the country's principal port has emerged as the main industrial and commercial center. Deteriorated law and order situation in the last 20 years resulted in production shutdowns and payment of extortion to various agencies. In addition, the increase in the cost of production due to higher energy costs, power outages resulting in loss of output, the last 20 years have witnessed the physical shifting of small enterprises to the Punjab (the origin of most of the small-scale manufacturers) and medium-scale enterprises to Dubai (because of a secure location and employer-friendly labor laws). Owing to these reasons, there has been a continuous decline in manufacturing activity.

The Karachi City Diagnostic study estimates an investment requirement of at least US\$9-10 billion over the next 10 years to close the infrastructure and services gaps.<sup>4</sup> At the same time, Karachi's economic growth and competitiveness has significantly stagnated relative to other cities in Pakistan and across the region. The business environment is largely hampered by critical infrastructure gaps, frequent power outages, congestion, and excessive regulations.

During the last few decades, Karachi has suffered infrastructure neglect and declining access and quality of urban services. The city's urban planning, management and service delivery has been unable to keep pace with the needs of the growing population. Karachi's infrastructure challenges are compounded by the city's high risk and vulnerability to climate-related disasters. Despite being a relatively dry city, Karachi faces heavy rainfall during monsoon season and is highly vulnerable to recurrent and massive flooding. Increasing flooding events are mainly a result of the poor performance of the city's drainage system, which is largely blocked by uncollected solid waste and unplanned informal settlements along the drainage channels. The World Bank is assisting Government of Sindh (GoS) on strengthening the institutional and financial capacity of the Karachi local councils (Karachi Metropolitan Corporation (KMC), six District Municipal Corporations (DMCs) and District Council Karachi) to deliver and maintain critical urban infrastructure and services through the project 'Competitive and Livable City of Karachi (CLICK)'.

### The Project: Competitive and Livable City of Karachi (CLICK)

The proposed Project proposes to support a higher goal of making Karachi livable and competitive by improving institutional performance and service delivery of participating local governments, including the Karachi Local Councils (LCs), as well as other agencies. The proposed project also aims at enhancing city financing, private sector participation, as well as regulatory environment, for improved service delivery.

#### Project's Development Objectives (PDOs)

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1 World Bank (2018), "Transforming Karachi into a Livable and Competitive Megacity: A City Diagnostic and Transformation Strategy".

2 Provisional estimate of Karachi Division (6 districts of Karachi) in National Population Census 2017. Various unofficial sources estimate the city's population to be higher.

3 Global Livability Index 2018 of Economist Intelligence Unit.

<sup>4</sup> World Bank, "Karachi: Rapid Environmental Diagnostic Report"

To improve urban management, service delivery and the business environment in Karachi.

### **Components of the Project**

There are following four components of the project:

**Component 1** – Performance-Based Grants to Local Governments and Capacity Building (indicative financing: USD 160 million). This component will provide annual formula-based grants to Karachi LCs upon achievement of performance results, which will provide incentives to local councils to improve basic capacity and performance.

**Component 2** – Modernizing Urban Property Tax Administration and System (indicative financing: USD 40 million). The objective of this component is to substantially improve Karachi's property tax system, which is currently performing well below its potential in terms of revenue collection. This will include potential devolution of Urban Immovable Property Tax (UIPT) collection function to urban local councils, assuming this policy decision is implemented by GoS.

**Component 3** – Improvement of City Competitiveness and Business Environment (indicative financing: USD 20 million). This component will support attracting private investment in service delivery and improving the business and regulatory environment in Karachi. This component will also build basic capacities at the local government level to manage commercial transactions in order to attract private investment at this level.

**Component 4** – Technical Assistance for Solid Waste Management (indicative financing: USD 10 million). This component will finance Technical Assistance activities for the Sindh Solid Waste Management Board (SSWMB), seeking its transformation into a fully functional and efficient entity.

### **Environmental Management Framework (EMF)**

CLICK triggers the World Bank Environment and Social Safeguard policies and has been assigned an EA Category B. Consistent with the requirements of World Bank Environmental Assessment OP4.01, the Local Government Department (LGD) of the Government of Sindh, as the implementing agency of the CLICK is required to prepare an Environmental Management Framework (EMF)<sup>5</sup>. The purpose of the EMF is to establish principles, rules, guidelines and procedures to ensure compliance of environmental safeguard requirements of the national laws and World Bank's safeguard policies for those project activities that are not yet defined and/or whose locations are unknown at the time the Bank appraises the project. In-line with Category B project requirements, the EMF sets out the policies, strategies, procedures and institutional requirements to screen the activities when their locations are identified and/or defined, the environmental documents required for these activities and the approval and clearance procedures to be followed. LCs will use this EMF during the planning, designing, construction and operational phases of the project components to ensure safeguard compliance and to mitigate environmental impacts at all the stages of the project as per the environmental management plan provided in the framework.

The LGD, on behalf of LCs has prepared this EMF by using primary and secondary information collected through literature review, reconnaissance survey, institutional and community stakeholder consultations, and consultation workshop. This framework will be followed by the Karachi LCs, once the individual sub-projects are identified during project implementation and their location, technical and engineering details are available. The EMF also provides the stakeholder engagement and involvement guidelines throughout the project life cycle and mechanism to disclose project information to them, and redress the grievances of the affected communities.

### **Environmental Baseline**

Karachi is located just above the tropical zone on the coast of the Arabian Sea at 24°45" to 25°15" north, and 66°37" to 67°37" east at about 20 m above sea level (airport weather station). Karachi is bounded by

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<sup>5</sup> An instrument that examines the issues and impacts associated when a project consists of a program and/or series of sub-projects, and the impacts cannot be determined until the program or sub-project details have been identified. ESMF sets out the principles, rules, guidelines and procedures to assess the environment and social impacts. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, provision for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts.

Hub-River (Balochistan Province) on West, Badin District on East, Dadu District on North and Arabian Sea on South. The climate of the Karachi can be characterized by dry, hot and humid conditions and in general terms it is moderate, sunny and humid. There is a minor seasonal intervention of a mild winter from mid-December to mid-February followed by a long hot and humid summer extending from April to September, with monsoon rains from July to mid- September. The level of precipitation is low for most of the year. The humidity levels usually remain high from March to November, while very low in winter as the wind direction in winter is North Easterly.

Climate of Karachi is semi-arid and rainfall is low and highly variable. Torrential rains and heavy rainfall mostly occur in the month of June under the effect of tropical storms. Torrential and heavy rains rarely affect coastal areas but cause flooding within the city. Karachi is located in a moderate earthquake zone.

Karachi covers an area of approximately 3,600 km<sup>2</sup>, comprised largely of flat or rolling plains, with hills on the western and northern boundaries of the urban sprawl. The city represents quite a variety of habitats such as the sea coast, islands, sand dunes, swamps, semi-arid regions, cultivated fields, dry stream beds, sandy plains, hillocks.

Indus River and Hub Dam on Hub River are the two major sources of surface water for Karachi. Karachi obtains its drinking water from the Indus River about 120 km to the east and the Hub River about 56 km in the west. Groundwater resources in the Karachi area are limited. The aquifers close to the coastal belt are mostly saline and unusable for domestic purposes. Aquifers near the Hub River are well developed and serve as sources of water for agriculture and domestic use.

Over the last three decades, Karachi consistently lagged behind in the maintenance and expansion of water supply system, bulk conveyance system, and distribution network as compared to the city demands due to high population growth rate (4 to 5% per annum), low capacity of institutions, and low level of financing. The consequence is the rationing of water supply currently in practice in most of the areas of the city. Water is supplied only once in every two or three days and for the duration of two to three hours at a time.

At present, four major drainage systems are serving Karachi city: the Lyari, the Malir, the Budnai, and small streams referred to collectively as the coastal basin. The Malir River Basin and the Lyari River Basin contribute about 80% of the surface runoff from the city. Thus, the natural drainage system of Karachi city is comprised of mainly the tributaries of the Malir and Lyari Rivers.

Most of the wastewater from industries does not comply with the Sindh Environmental Quality Standards (SEQS) and result in considerable environmental pollution and degradation. The main sources for pollution in coastal waters are indiscriminate discharges of untreated industrial and domestic effluent, shipping traffic, mechanized fishing fleet and oil terminals at Karachi harbor.

World Health Organization (WHO) included Karachi amongst the top 20 polluted cities of the world with respect to outdoor ambient air pollution levels measured as PM<sub>10</sub> and PM<sub>2.5</sub>. Annual mean concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> in Karachi are 273 µg/m<sup>3</sup> and 117 µg/m<sup>3</sup>, respectively.<sup>6</sup>

Malir River and its adjoining sites in the east are densely populated with wide variety of vegetation in the form of natural foliage consists of: bushes, shrubs, trees including agricultural products such as crops, vegetables and fruits. No endangered fauna exists in the eastern boundaries section. Fauna of the area is comprised of: some avian fauna, sparrows of diversity genera, crows, cuckoos, and wild and domesticated pigeons.

Population of Karachi is exposed to the health risks linked to high air, water and solid waste pollution levels. Large proportion of the city's population lives in katchi abadies (slums). In katchi abadies the infrastructure is dilapidated and access to basic services is very low.

The Pakistan Social & Living Standards Measurement Survey of 2014-15 showed a 76% literacy rate for the urban areas of Sindh. The literacy rate for Karachi is 82%. The overall literacy rate for urban areas in Pakistan was 76% (Literacy for population above 10 year and older).

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<sup>6</sup> WHO, "Public Health, Environmental and Social Determinants of Health: Ambient (Outdoor) Air Pollution in Cities Database 2014.

## Regulatory Review

This section documents three sets of policies and strategies, and laws i.e. national, provincial, and World Bank Safeguard Policies.

### National Policies and Strategies, and Laws

The national policies and strategies, and laws relevant for the environmental safeguard of the project activities are: National Water Policy 2009, Climate Change Policy of Pakistan 2012, Pakistan Climate Change Act, 2016, The Canal and Drainage Act 1873, Pakistan Penal Code, and The Antiquities Act 1975.

### Provincial Policies and Strategies, and Laws

The provincial policies and strategies, and laws relevant for the environmental safeguard of the project activities are: Sindh Strategy for Sustainable Development, 2007, Sindh Sanitation Policy 2017, Sindh Drinking Water Policy 2017, Karachi Strategic Development Plan 2020, Karachi Water and Sewerage Board Act, 1996, Sindh Environmental Protection Act 2014, Sindh Environmental Protection Agency (Review of IEE and EIA Assessment) Regulations, 2014, The Sindh Local Government Act 2013, and The Sindh Wildlife Protection Ordinance, 1972.

### World Bank Safeguard Policies

CLICK triggers the World Bank safeguard policies including Environmental Assessment OP 4.01, and Physical Cultural Resources OP 4.11.

## Potential Environmental Impacts and Mitigation Measures

As stated above that CLICK is EA category-B project, its environmental impacts are likely to be more moderate and local, and not significant overall at the project level. Sub-projects that would have major, widespread and intense environmental impacts will be excluded from the project and will not be eligible for financing. CLICK may finance individual sub-projects and activities in Component 1 that may still have significant impacts but will not be wide spread, and therefore, can either be avoided through re-location of activities or in their design, or otherwise reduced to acceptable levels or reversed through the application of effective mitigation measures. The impacts of sub-projects financed under the Block Grants by the LCs are expected to occur during the construction activities, and lesser extent during their operations and maintenance activities. Most of the environmental impacts will be temporary and manageable, and in all cases tangible mitigation measures exist for each and every impact. Potential impacts may include: i) soil pollution, air pollution, and disturbance to the aesthetic of the area due to clearing of the land for campsites and for construction activities, ii) temporary disturbance to natural habitats and biodiversity, iii) marginal impacts on Physical Cultural Resources (PCRs) if located at the project sites, iv) air pollution resulting in poor visibility, disturbance to vegetation and property, and health implications on workers and nearby communities due to dust emissions, stack emission of generators and vehicular emissions, and for a short time due to asphalt fumes, v) water contamination, odor, health implications (due to breeding of mosquitos and flies), and nuisance due to improper treatment and disposal of sanitary wastewater from construction camps, vi) nuisance, health implications on workers and communities (due to breeding of mosquitos and flies), if solid waste is not disposed and treated properly, vii) soil contamination due to improper disposal of hazardous solid waste and improper placement of oily parts, rags, chemicals, and lubricants, viii) nuisance, health implications on workers and nearby communities, loss of biodiversity due to noise from the construction activities, machineries and vehicles, ix) Occupational Health and Safety (OHS) issues for workers and community, x) traffic congestion at or around construction sites due to construction activities, and xi) inconvenience to the public due to damaging of underground utilities lines

The operational phase impacts arising from storm water drainage repair and rehabilitation projects, and repair and rehabilitation of roads, pedestrian walkways and bicycle paths include: i) soil and water contamination due to leakages in the drains, ii) odor and outbreak of diseases due to leakages, damaging and overflowing of drains, and iii) air pollution and enhanced city's carbon foot print if roads, walkways and bicycle paths are not maintained properly.

The proposed mitigation measures during construction activities include: i) campsite management, ii) avoidance of clearing vegetation and restoration of the site by planting trees/shrubs, iii) protection of natural habitats, iv) protection of Physical Cultural Resources (PCRs), v) suppression of dust emission and asphalt fumes, vi) control of stack and vehicular emissions, vii) safe disposal of sanitary wastewater, viii) safe disposal of domestic solid waste, ix) safe disposal of hazardous and construction waste, x) soil pollution

control, xi) noise abatement measures, xii) protection of workers from health and safety impacts, xiii) protection of community from accidents, xiii) traffic management, xiv) and xv) restoration of campsites.

The mitigation measures during operational phase of the storm water drainage and roads projects include: proper maintenance of storm water drainage system, roads, pedestrian walkways and bicycle paths.

## **Stakeholder Consultation**

KMC and DMCs recognize the importance of early and continuing engagement and meaningful consultation with stakeholders. KMC and DMCs will engage the stakeholders, including communities, groups, or individuals affected by proposed projects, and with other interested parties, through information disclosure, consultation, and informed participation in a manner proportionate to the risks to and impacts on affected communities. At this point in time, the details about the project/subprojects and their exact locations are not known, therefore, it is not possible to engage communities and carry out the consultation for those projects which are unknown. KMC and DMCs conducted a consultation workshop with the stakeholder representatives including: KMC, six DMCs, NGOs, Community Based Organizations (CBOs) etc. The participants of the workshop were of the view that the project in addition to repair and maintenance of existing roads should also include construction of new roads, flyovers, underpasses etc. to improve the traffic flow in the city. Participants emphasized that KMC and DMCs should learn from the experience of World Bank's ongoing infrastructure project (Karachi Neighborhood Improvement Project-KNIP) while designing infrastructure subprojects for CLICK. Participants inquired about the possibility of including incinerators for the public health facilities in the project. Proponent of the project responded that installation of incinerators is not eligible sub-project under CLICK. KMC and DMCs representatives committed that after the finalization of project locations, and availability of technical details for each component of the project; Focused Group Discussions (FGDs) will be conducted with the directly affected stakeholders.

Community representatives reported that communities were facing poor environmental conditions with very low level of water supply and sanitation services. Communities living along the main drains and rivers are facing serious environmental and community health issues. Most of the representatives of the communities reported that water supply was intermittent, erratic, and contaminated. Representatives reported that during rainy seasons, most of the areas get flooded, and overflow of sewerage water result in serious health issues and inconvenience to the communities.

LCs under CLICK will be mostly involved in the rehabilitation of existing infrastructure. Under SEPA 2014, EIAs for infrastructure rehabilitation projects are not required by SEPA. Accordingly, LCs did not conduct any environmental assessments in the past. Consequently, environmental assessment and monitoring capacities do not exist in LCs.

In line with the environmental assessment requirements of International Bank for Reconstruction and Development (IBRD) or International Development Association (IDA) financing, LCs will consult project affected groups and local nongovernmental organizations (NGOs) about the project's environmental impacts, and committed to incorporate their opinions, concerns, and ideas in the design and construction of the sub-projects.

## **Institutional Arrangement and Environmental Assessment of CLICK**

The Project Management Unit (PMU) for the implementation of CLICK will be established in the Local Government Department (LGD) of the Government of Sindh. An Environmental and Social Cell (ESC) staffed by qualified environmental and social specialists will be established in the PMU. ESC will support the LCs to take care of the environmental and social safeguard requirements of their sub project components. The ESC will be the custodian of the EMF at the overall project level. The main function of the ESC will be to support the LCs to ensure the compliance of the EMF during the implementation of eligible sub-projects in line with SEPA 2014 and the World Bank safeguards operational policies.

Under World Bank's Operational Policy 4.01 (Environmental Assessment), the bank requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that these are environmentally sound and sustainable, and thus to improve decision making. First step of the environmental assessment is the screening. LCs will conduct Environmental screening with the assistance of the ESC. Screening of the sub projects will be carried out at the time of identification and aligned with the local planning process and cycle of the LCs. The environmental screening of each proposed sub-project shall be carried out to

determine the appropriate extent and type of EA required. The Bank classifies the proposed project into one of four categories of A, B, C and FI, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. After the screening process and classification of the category, **sub projects that are classified an EA category A will be ineligible for financing and will not be processed any further.** Based on the screening mechanism for eligible sub-projects under CLICK, it is assessed that in all cases preparation of corresponding ESMPs will be required for each sub project. The ESC will assist the LCs to prepare the ESMPs. Again, sub projects that are classified A and FI will not be eligible for financing.

The Sindh Environmental Protection Agency Review of the IEE and EIA Regulations, 2014 categorizes development projects into three schedules, according to their anticipated potential environmental impact for the preparation of Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), and Screening and checklists as per the schedule. The project will not finance any sub-project that requires EIA. SEPA 2014 requires preparation of environmental checklists for the rehabilitation of infrastructure projects proposed under CLICK.

Following sub projects shall not be considered for the implementation (please refer to the Social Management Framework (SMF) for the complete social screening mechanism):

- Sub-projects which have large environmental or social impacts (i.e. EA Category A sub projects);
- Projects which will require extensive land acquisition;
- Sub projects located at any site affected (or to be covered) by the ongoing anti-encroachment drive, as the conduct of that drive does not comply with WB social safeguard policies

**All sub project ESMPs must be prior reviewed by the World Bank and will require the “no-objection” of the World Bank before any sub project will be eligible for financing by the CLICK project.**

## **Grievance Redress Mechanism**

KMC and DMCs will respond to concerns and grievances of project affected parties related to the environmental and social performance of the project in a timely manner. For this purpose, KMC and DMCs will implement a Grievance Redress Mechanism (GRM). The KMC, and DMCs will establish a GRM to facilitate the resolution of community complaints and grievances. Under this mechanism, a Grievance Redress Cell (GRC) will be established in the PMU. One GRM focal person at each construction sites will be designated during construction phase. This person will be directly accessible to the community for the registration of complaints and their resolution. The established GRM will be communicated to the public and particularly the affected communities through print and electronic media, and during public consultations and community engagement events. This cell will maintain a Community Complaints Management Register (CCMR), at the site, for registering complaints and grievances. All written and oral grievances will be recorded in the Register. For operational phase GRM, the respective Engineers and Plant Managers of the utilities and plants respectively will be responsible for maintaining community complaints in the CCMR and their resolution. Android based GRM Application (GRM App) will also be established and launched to make GRM effective, easy and accessible to everybody for lodging complaints.

## **Public Consultation Framework**

Public consultation framework to be followed by the project in line with the requirements of International Bank for Reconstruction and Development (IBRD) or International Development Association (IDA) financing.

## **Budget**

The tentative budget under different cost head is proposed. Total estimated budget for the compliance of environmental safeguard requirements is about Rs. 91.91 million.

## 1.0 INTRODUCTION

This chapter provides background of the project and its components to be financed by the World Bank, profile of the proponent, and the Environmental Management Framework (EMF) for these projects.

### 1.1 Background

**Karachi is Pakistan's largest city, its economic and financial hub and main seaport.** It contributes an estimated 15 percent of national GDP and the largest share of national tax revenues, industrial employment, manufacturing and high-end services<sup>7</sup>. With an estimated population of 16 million<sup>8</sup>, Karachi also dominates the economic and demographic landscape of Sindh and is the capital of the province. It has one-third of Sindh's total population, nearly all of its industrial and service economy and a majority of its labor force. It has the potential to be a catalyst and engine of economic growth for the country due to its size, location existing base of industrial and human capital. As Pakistan's first capital city for two decades, the city played a leading role in national industrial and economic development in Pakistan's early decades. However, in recent decades the city has suffered a major decline and now faces substantial constraints which have impacted its livability and economic competitiveness.

**Karachi is listed among the five least livable cities in the world**, ranked 137 out of 140 and above only Damascus, Dhaka and Lagos.<sup>9</sup> In the last few decades it city has suffered a sharp decline in access to basic infrastructure and services, due to a combination of factors including political instability; periods of intense conflict and violence among a multitude of ethnic, political and religious groups; and long term neglect of infrastructure and service needs. Only about half of the city's water requirements are met; public transport is in a deteriorated condition and entirely informal; half of its citizens live in informal settlements (*katchi abadis*); and pollution and environmental degradation is severe. On the positive side recent years have seen a substantial reduction in violent crime due to concerted efforts by state agencies.

**Economic growth and competitiveness in the city has declined in recent decades relative to other cities in Pakistan and the region.** Evidence from nighttime lights—a proxy for economic activity—showed declining economic activity in core areas of the city in the period 1999-2010, and this trend has continued.<sup>10</sup> This stagnation of economic activity in the country's most populous city is severely detrimental to its long term economic and social potential. Economic competitiveness has also declined, and the city now has a weak and unfavorable business environment, as evidenced in Karachi's Doing Business indicators being much poorer than South Asian averages.

Karachi performs poorly in the dimensions of livability, health, environment, safety and education. Green and open spaces, as a share of the city's land area, are declining and high-density luxury apartments are perceived as displacing public spaces for the middle and lower classes. The city

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<sup>7</sup>World Bank (2018), "Transforming Karachi into a Livable and Competitive Megacity: A City Diagnostic and Transformation Strategy".

<sup>8</sup> Provisional estimate of Karachi Division (6 districts of Karachi) in National Population Census 2017. Various unofficial sources estimate the city's population to be higher.

<sup>9</sup> Global Livability Index 2018 of Economist Intelligence Unit.

<sup>10</sup> World Bank (2018), "Transforming Karachi into a Livable and Competitive Megacity: A City Diagnostic and Transformation Strategy".

is also very dense, with more than 20,000 persons per square km. From 2001 to 2013, the urban footprint expanded by more than a quarter with signs of sprawl, without the accompanying investments in services and infrastructure. Migration is the primary growth factor, and the city is characterized by pockets of ethnically homogenous zones within a heterogeneous city.

**There are four interlinked constraints** which are impacting the city's livability and economic competitiveness:

- a. Weak and very low **institutional capacity**, especially at local level, due to institutional fragmentation, nascent systems and capacity and unclear and overlapping responsibilities;
- b. Poor and declining **basic service delivery**, as seen in poor quality and coverage of all basic services;
- c. Limited **financing** for the city and inadequate capital investment due to poor own-source revenue (OSR) generation, very low cost-recovery for services and major constraints to private capital investment in infrastructure and services; and
- d. Onerous and opaque **business environment** constraining private sector investment and operations.

**Karachi's management is hampered by large financial, technical and institutional challenges faced by local councils (LCs) in providing services.** Municipal functions – those which are not controlled by the Government of Sindh (GoS) - are divided among a two-tiered structure of LCs: one Karachi Metropolitan Corporation (KMC) for the entire urban area of Karachi, and six District Municipal Corporations (DMCs), each covering one of the six districts of the city. Rural areas of Karachi are covered by District Council Karachi. There is no formal coordination mechanism between these tiers, leading to substantial inefficiencies and challenges in city management. These LCs in their present form are also relatively new, and basic systems for planning, implementation and transparency are weak. Their revenues are also insufficient to cover their service delivery needs, with a high dependence on fiscal transfers from GoS, which account for more than 80 percent of total ULG revenue<sup>11</sup>. Most of these are conditional grants meant for salary and other tied recurrent expenses. Finally, LCs also have limited authority and mandates, with GoS in the recent past taking over (or “recentralizing”) a number of municipal service delivery functions under its direct control, including master & land use planning, building control and solid waste management. Water and sewerage is managed by a separate utility for the city, which has historically always been under provincial administrative control. Investment spending by LCs in Karachi is also extremely low, due to weak capacity, limited mandates and low revenues. Per capita annual spending on capital infrastructure and services is only PKR 382 for KMC (US\$2.70) and PKR 475 (US\$3.40) for DMCs (average for six DMCs, with range being PKR 183 to 941 (US\$1.30 to 6.70) across the six)<sup>12</sup>. Total capital spending by LCs is only 2 percent of the total capital (“development”) budget of the province. See **Annex 4** for a detailed description of the administrative and LG system in Karachi includes mandates for LCs along with population of each district.

**Every measure of basic service delivery shows Karachi's poor condition and in a context of rapid demographic growth, all services have struggled to keep pace.** These include water and sewerage, urban transport and mobility, public spaces and amenities and solid waste management (SWM), causing substantial harm to the city's livability, environment and public health. Solid waste has especially been indicated as a top priority for the city by all levels of

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<sup>11</sup> This figure is when summed across all 7 LCs. It is 90 percent for KMC and ranges from 50 to 82 percent across the six DMCs. Own-source revenue (OSR) account for 10 percent of LCs revenue. For DMCs the remaining balance is primarily their respective shares in urban immovable property tax collections, collected by GoS and transferred to DMCs.

<sup>12</sup> This figure is for FY2017/18 for “development expenditure” which frequently includes large deferred maintenance. Figure for KMC is low because the population under its mandate is the entire urban area of Karachi (i.e. 14 million people). In FY2016/17, the corresponding figure was PKR 535 for KMC and only PKR 281 per capita on average for all six DMCs.

government – local, Provincial and Federal. An average of 12,000 tons of household waste is produced daily, of which only three-quarters is transported to designated disposal sites – which are all non-sanitary. While collection rate for daily waste generation has seen improvement in the last few years due to increased public expenditure by GoS, there is still a large backlog of waste and strong environmental impacts: waste burning and use of waste fuels by industrial facilities are the second and third biggest causes of air pollution in the city. Pollution from plastics is of particular concern: plastics account for about 60 percent of waste found on Karachi's beaches, by density<sup>13</sup>. Karachi ranks low compared to other megacities in waste management with all parameters ranking below low-income country benchmarks except for the collection rate<sup>14</sup>. Weak SWM also increases the risk of flooding due to substantial dumping of waste in the city's drainage network, leading to flooding during the monsoon season. Finally, Karachi has also developed a negative perception nationwide for being Pakistan's dirtiest major city, thus having an implicit negative impact on investment and competitiveness.

**Public sector spending is well below requirements to meet Karachi's needs and there is a weak institutional framework to mobilize private capital investment to fill the financing gap.** The Bank estimates that Karachi needs at least US\$9-10 billion over a decade to meet needs in transport, water, wastewater and SWM. Existing public spending is far lower than that: GoS, through its numerous agencies, spends around US\$100 million annually in Karachi on capital infrastructure (in water, sewerage, SWM, urban transport (roads and public transit) and other ancillary services), while Karachi LCs have been spending a combined US\$30-50 million on services within their mandates annually, totaling to about only US\$130-150 million annually. This public investment in the city's infrastructure is equivalent to only 0.3 percent of Karachi's share of national GDP, far lower than the national average of 1.25 percent of GDP as public investment in infrastructure. Pakistan's public investment in infrastructure is already the lowest in the region as a share of GDP, compared to 5 percent for India, 4 percent for Bangladesh and 16 percent for China<sup>15</sup>.

**One of the key reasons for perennially low financing for the city's needs is weak sources of stable revenue for financing.** Annual revenue from the Urban Immovable Property Tax (UIPT) is extremely low compared to its potential, collecting only around PKR2.5 billion (US\$18 million) annually<sup>16</sup>. In comparison, Punjab province collects four times as much from its cities every year, despite having less than double Sindh's urban population. A single comparable metropolitan city in India collects many times more in annual property tax. Increasing revenue from UIPT is essential to finance the city's infrastructure needs.

**Concurrent to boosting Karachi's recurrent revenue, it is important to build the city's capacity to leverage its existing capital assets.** Karachi is asset rich but cash poor. Given its critical infrastructure needs, increasing non-tax revenues by leveraging public assets is becoming increasingly important. However, there is limited functional and technical capacity to identify and structure commercially viable infrastructure projects to crowd-in private investment. In addition, majority of city-level public agencies lack balance sheets which makes them un-bankable. Efforts to build balance sheets and commercial skills in the public sector along with the increase in recurrent tax revenue, will also help improve the creditworthiness of GoS in the medium-term and enable it to leverage such revenue streams for increased sub-national borrowing to finance capital investment.

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13 Waste distribution studies of four beaches in Karachi show that waste in these locations has a density about 1 kg/m<sup>2</sup>, and within that plastics account for a density of 0.6 kg/m<sup>2</sup>

14 Based on UN-Habitat methodology of 2010 to evaluate state of SWM in cities.

15 Asian Development Bank (2017), "Meeting Asia's Infrastructure Needs".

16 Technically this collection figure is for urban areas for entire Sindh, but ninety percent of these collections are from Karachi. This tax is collected by GoS and distributed to urban local governments from where collection was made, after retention of 15 percent.

**The business environment in Karachi is significantly hampered by weak and fragmented regulatory governance.** The private sector is required to deal with multiple regulatory agencies at the provincial and municipal level to register a business, secure licenses/permits to initiate operations, maintain licenses, and to comply with regulations governing various inspections. There are more than thirty separate license and permit issuing agencies in Sindh, each with different business processes. Almost all regulatory processes are manual and paper-based with minimal automation, leaving considerable room for discretion and creating significant uncertainty in the business environment. Regulations are not clearly defined nor readily available in a central repository. Risk-based regulatory oversight is almost non-existent, and enforcement is patchy with ad hoc inspections. These factors increase opportunities for rent-seeking and undermine the ability of newer or smaller firms to operate efficiently or on a level playing field with larger firms. More than one-third of Karachi firms in the Bank's Enterprise Surveys identified misconduct as the biggest constraint to the business environment in 2013, much higher than other provinces in the country<sup>17</sup>.

**Automation and integration of regulatory processes will improve the business environment and help increase private investment in the city.** Simplification, streamlining, automation and integration of the regulatory and institutional regime governing the business environment will have a positive impact in the medium term on economic growth and job creation not just in Karachi but at the national level. Karachi accounts for 65 percent of total weightage in Pakistan's rankings on the Bank's Doing Business (DB) rankings, which are comprised of performance in 10 different indicators. Currently it takes 10 procedures, 17 days and about 7 percent of per capita income to start a business in Karachi, much higher than South Asian averages<sup>18</sup>. GoS has already started to respond to private sector demands to facilitate private investment in the city by introducing reforms to streamline and simplify the process of investing and operating in the city. Pakistan's DB ranking improved by 11 positions (from 147 to 136) in 2019 due to specific reforms on business and property registrations, the first significant improvement in 11 years. Despite these recent improvements, substantial reforms are needed to further improve the city's competitiveness. These reforms include a transparent, less discretionary and streamlined business environment. A key step will be the development of a One-Stop-Shop (OSS) for business facilitation which uses technology to foster institutional integration and disentangles the procedural web which businesses have to navigate. This OSS, which goes beyond what is measured by the DB methodology, has the potential to considerably improve the city's competitiveness and business environment and help unlock private investment in the city.

**The city also faces substantial gender gaps.** There is limited involvement of women in planning of municipal services and infrastructure, with the result that these are not responsive to their needs. Access to and use of infrastructure such as public spaces in the city is a bigger challenge for women compared to men, which reduces their ability to participate in civic and economic life. Mobility, walkability and access for women is limited due to a mixture of poorly-planned infrastructure (such as lack of adequate sidewalks, lighting, public toilets and dedicated open spaces), prevailing socio-cultural norms and threats to public safety. Working conditions at LCs are also disadvantageous for female employees of LCs. Only one out of 7 LCs has set up an inquiry committee for protection against harassment at the workplace mandated by law for each employer, and none of them have developed a code of conduct for which is to be displayed in their offices, again required by law.<sup>19</sup>

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17 World Bank (2018), "Transforming Karachi into a Livable and Competitive Megacity: A City Diagnostic and Transformation Strategy".

18 World Bank Doing Business Report 2019.

19 The "Protection Against Harassment of Women at Workplace Act" of 2010 requires each employer to make functional an inquiry committee (comprising at least a woman member out of three), and develop a code of conduct for protection against harassment at the workplace and display it at their offices.

**Karachi’s challenges are compounded by its high risk and vulnerability to climate hazards.**

The city is exposed extreme temperature events, with deadly heat waves recently recorded in 2015, 2017 and 2018. Despite being a relatively dry city, Karachi faces rainfall during the monsoon season and is vulnerable to recurrent urban flooding, due to its poorly functioning drainage system (combined storm water-wastewater) which is largely blocked by uncollected solid waste, informal settlements, and an extensive backlog of maintenance and rehabilitation. Many roads suffer reduced life cycles due to damage by this recurrent flooding. Poor solid waste management reduces peak flow capacity of the city’s drainage system and negatively impacts people’s health and the environment. Waste burning is the second biggest cause of atmospheric pollution in Karachi.<sup>20</sup>

The World Bank is assisting GoS on strengthening the institutional and financial capacity of the KMC and the six DMCs to deliver and maintain critical urban infrastructure and services through the project ‘Competitive and Livable City of Karachi (CLICK)’.

Karachi is divided into six districts, 18 towns, 178 union councils and six cantonments. The detail is as given in Table 1.

**Table 1: Detail of Districts, Union Councils and Cantonments of Karachi**

#	District	Towns	No. of Union Councils	Cantonments
1	South	Lyari, Saddar	22	Karachi
2	East	Jamshed, Gulshan	26	Clifton
3	Central	Liaquatabad, North Nazimabad, Gulberg, New Karachi	42	Korangi Creek
4	West	Kemari, SITE, Baldia, Orangi	38	Faisal
5	Malir	Malir, Bin Qasim, Gadap	22	Malir
6	Korangi	Korangi, Landhi, Shah Faisal	28	Manora

**1.2 The Proponent: Karachi Metropolitan Corporation and Six District Municipal Corporations**

The proponent of the project are the ‘Karachi Metropolitan Corporation (KMC) and Six District Municipal Corporations (DMCs). The KMC is a public corporation and governing body to provide municipal services in Karachi. The major functions of KMC are the planning, development and maintenance of 28 roads, bridges, street lights, storm water drains, special development projects, abattoir and cattle colonies, zoological gardens , safari parks , aquarium , sports complex, beaches, art galleries, museum, metropolitan library, milk supply schemes, land control/removal of encroachment, solid waste management, municipal watch and ward, firefighting, traffic engineering, charged parking and coordination, monitoring and supervision of the assets.

Major functions of the DMCs are to provide, manage, operate, maintain and improve the municipal infrastructure and services including:

- Water supply and control and development of water sources, other than systems maintained by the Union and Village councils.

20 World Bank (2014), “Cleaning Pakistan’s Air: Policy Options to Address the Cost of Outdoor Air Pollution.”

- Sewerage, sewage and sewage treatment and disposal
- Storm water drainage
- Sanitation and solid waste collection and sanitary disposal of solid, liquid, industrial and hospital wastes
- Roads and streets, other than roads falling under the jurisdiction of, and maintained by the Provincial Government and streets maintained by the Union Administration or Village council
- Traffic planning, engineering and management including traffic signaling systems, signs on roads, street markings, parking places, transport stations, stops, stands and terminals
- Street lighting
- Fire-fighting
- Parks, playgrounds open spaces and arboriculture
- Slaughter houses

### 1.3 The Project: Competitive and Livable City of Karachi (CLICK)

The development objective of the project is to improve the performance of local governments and agencies in Karachi's urban management, financing and service, and to improve business regulation in Sindh with collaborative efforts of the Karachi Municipal Corporation (KMC) and six District Municipal Corporations (DMCs), as well as other agencies. The proposed project also aims at enhancing city financing, private sector participation, as well as regulatory environment, for improved service delivery. The proposed CLICK would support the following four components.

#### 1.3.1 Components of the Project

There are following four components of the project:

**Component 1** – Performance-Based Block Grants to Local Governments and Technical Assistance (indicative financing: USD 160 million). This component will provide annual formula-based grants to KMC and six DMCs upon achievement of performance results, which will provide incentives to local councils to improve basic capacity and performance.

**Component 2** – Technical Assistance for Reforming Urban Property Tax (indicative financing: USD 40 million). The objective of this component is to substantially improve Karachi's property tax system, which is currently performing well below its potential in terms of revenue collection. This will include potential devolution of Urban Immovable Property Tax (UIPT) collection function to urban local councils, assuming this policy decision is implemented by GoS.

**Component 3** – Improving City's Competitiveness and Business Environment (indicative financing: USD 20 million). This component will support attracting private investment in service delivery and improving the business and regulatory environment in Karachi. This component will also build basic capacities at the local government level to manage commercial transactions in order to attract private investment at this level.

**Component 4** – Technical Assistance for Solid Waste Management (indicative financing: USD 10 million). This component will finance Technical Assistance activities for the Sindh Solid Waste Management Board (SSWMB), seeking its transformation into a fully functional and efficient entity.

### 1.4 Environmental Management Framework (EMF)

CLICK triggers the World Bank Environment Assessment OP4.01. Accordingly, EMF is required to ensure the compliance with environmental safeguard requirements in line with the national laws

and World Bank’s safeguard policies for those project activities that are not yet defined and/or whose locations are unknown at the time the Bank appraises the project.

EMF is an instrument that examines the issues and impacts associated when a project consists of a program and/or series of sub-projects, and the impacts cannot be determined until the program or sub-project details have been identified. The EMF sets out the principles, rules, guidelines and procedures to assess the environmental impacts. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts.

The LGD, on behalf of the LCs has prepared this EMF for the CLICK project. The purpose of the EMF is to ensure environmental safeguards compliance and mitigate environmental impacts at all the stages of the project and sub-projects as per the environmental management plan provided in this framework. EMF will be used during designing, construction and operational phases of the project components.

This EMF has been prepared based on primary and secondary information. Most of the information was collected from literature, reconnaissance survey, and consultations with community and institutional stakeholders. This framework will be followed once the sub-projects are identified and their details are available. This framework also discusses the stakeholder engagement and involvement throughout the project life cycle and mechanism to disclose project information to them and redress the grievances of the affected community.

#### 1.4.1 Objective and Scope of EMF

The main objective of the document is to provide a framework for the environmental assessment and mitigation of potential environmental risks and impacts of the proposed project components on surrounding environment and communities. The framework outlines approaches for management of safeguards issues and impacts that are common to these project aspects such as (but not restricted to) waste management, grievance redress mechanism, monitoring and evaluation, etc.

Adequate information has been included in the EMF about the area in which sub-projects are expected to be sited, including any potential environmental vulnerabilities of the area; and on the potential impacts that may occur and mitigation measures that might be expected to be used.

#### 1.4.2 Structure of EMF

The EMF consists of ten chapters. The brief of each chapter is given below:

	<b>Executive Summary</b>	<i>Provides summary of the EMF contents and key findings.</i>
1	<b>Introduction</b>	<i>Background of the project and brief description, information of the proponents, introduction of the EMF, its objective and structure, and study team</i>
2	<b>Project Description</b>	<i>Detailed description of project and its components</i>
3	<b>Environmental Baseline</b>	<i>Description of environmental baseline of the entire area for the proposed sanitation project/subprojects including physical, biological, socioeconomic conditions and cultural aspects relevant to project and its potential impacts including any changes anticipated before the project commencement</i>
4	<b>Regulatory Review</b>	<i>Brief description of the national, provincial and World Bank laws, policies, strategies, guidelines, codes and procedures for the categorization, screening, environmental</i>

		<i>assessment and compliance of the proposed project/subprojects. This chapter establishes that how the various requirements have been or will be complied with during the planning and implementation stages of the subprojects.</i>
5	<b>Potential Environmental Impacts and Mitigation Measures</b>	<i>Description of potential generic environmental risks and impacts (direct, indirect/induced and cumulative) to be caused by the project's construction and operation phases on surrounding environment and community. Description of mitigation measures as per mitigation hierarchy (avoidance, minimization or reduction, mitigation, compensate/offset).</i>
6	<b>Stakeholder Consultation</b>	<i>Describes the objective, process, and outcome of the stakeholder consultations carried out during the EMF preparation</i>
7	<b>Environmental Management Framework (EMF)</b>	<i>Description of institutional arrangements for environmental management, screening methodology, generic mitigation plan, monitoring framework, and capacity building of stakeholders involved in environmental assessment, monitoring and management. The guidelines for environmental compliance and occupational health and safety requirements have been described.</i>
8	<b>Grievance Redress Mechanism</b>	<i>Description of the Grievance Redress Mechanism to be adopted by the proponent to facilitate resolution of any community complaints and grievances about the project's environmental performance, in line with the requirements of World Bank.</i>
9	<b>Budget</b>	<i>Estimated budget for executing the EMF, monitoring cost etc.</i>
	<b>Annexes</b>	<i>Generic EMP, checklists, Terms of Reference of the Environmental Specialist for the project</i>

## 2.0 PROJECT DESCRIPTION

This chapter describes detail of the components of the project ‘Competitive and Livable City of Karachi (CLICK)’.

### 2.1 Project’s Development Objectives (PDOs)

To improve urban management, service delivery; and the business environment in Karachi.

### 2.2 Description of Project Components

The description of the project components is given below:

<p><b>Component-1</b></p> <p><b>Performance Based Block Grants to Local Governments and Technical Assistance to Local Government Department</b></p> <p><i>(US\$160 million)</i></p> <p>1.1 <i>Performance Based Grants to Karachi Urban Local Governments</i></p> <p>1.2 <i>Technical Assistance for Local Government Department (LGD) and Implementation Support</i></p> <p><b>Implementation Agency(s)</b></p> <p>i) LCs</p> <p>ii) LGDs</p>	<p><b><u>Sub-component 1.1: Performance-based Grants to Local Councils and Capacity Building (WB financing: US\$140 million)</u></b></p> <p>This component will provide annual performance-based grants to Karachi’s urban local governments (LCs, also referred to as urban local councils (ULCs))—namely KMC and six DMCs—upon achievement of specified institutional results. The component will incentivize LCs to improve basic institutional capacity and systems, to improve service delivery, livability and competitiveness in the city. LCs will use the capital infrastructure grant funds to execute selected infrastructure and services within their mandate, serving the needs of citizens and businesses in their area. Performance measures will be grouped under the following thematic areas: a) capital investment planning &amp; budgeting; b) improved systems for Social &amp; Environmental management; c) procurement processes; d) financial management and auditing; e) improved engagement with citizens, especially women, and local private sector; f) improved competitiveness including streamlined business permitting and inspections within ULG mandate; g) own-source revenue improvement; h) transparency &amp; access to information for citizens and local businesses as well as grievance redress systems for citizens and local businesses.</p> <p>The LCs will receive the following three types of grants:</p> <p>a. <b><u>Minimum Conditions Capital Infrastructure Grant</u></b> (Total WB financing US\$33 million): These will be accessible upon achieving specified Minimum Conditions. Minimum conditions will provide a basic acceptable level of processes in LCs on technical, financial management, procurement and social and environmental management, as required by Bank policies. All minimum conditions must be fulfilled each year by a ULG to qualify for either of the two Capital Infrastructure grants.</p> <p>b. <b><u>Performance Measures Capital Infrastructure Grant</u></b> (Total WB financing US\$100 million): These will be accessible upon achieving specified Performance Measures. Grant disbursement will be incentive-based, with higher performing local councils receiving a larger grant amount.</p> <p>c. <b><u>Capacity Building Grant</u></b> (Total WB financing US\$7 million): These will be accessible upon achieving two capacity building Access Conditions. Funds under this grant will be used for basic capacity needs of LCs such as technology upgrades and/or small consultancy services.</p> <p>Indicative menu of investment for KMC/DMCs is provided as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9d9d9;"> <th style="text-align: left;">Functional Area</th> <th style="text-align: left;">Indicative Permissible Capital Investments</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Connectivity &amp; Urban Road Network</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>• Repair &amp; rehabilitation of Roads, streets, signalized intersections etc. under respective jurisdictions of LCs</li> <li>• Pedestrian sidewalks &amp; walkways, bicycle paths, pedestrian bridges &amp; crossings</li> <li>• Street lighting, security lighting, and road signage – including energy-efficient lighting (with LED bulbs and/or solar-powered)</li> </ul> </td> </tr> <tr> <td style="vertical-align: top;">Urban &amp; Storm Water Drainage</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>• Urban drainage systems; Repair &amp; rehabilitation of Drains and flood control systems under respective jurisdictions of LCs</li> </ul> </td> </tr> </tbody> </table>	Functional Area	Indicative Permissible Capital Investments	Connectivity & Urban Road Network	<ul style="list-style-type: none"> <li>• Repair &amp; rehabilitation of Roads, streets, signalized intersections etc. under respective jurisdictions of LCs</li> <li>• Pedestrian sidewalks &amp; walkways, bicycle paths, pedestrian bridges &amp; crossings</li> <li>• Street lighting, security lighting, and road signage – including energy-efficient lighting (with LED bulbs and/or solar-powered)</li> </ul>	Urban & Storm Water Drainage	<ul style="list-style-type: none"> <li>• Urban drainage systems; Repair &amp; rehabilitation of Drains and flood control systems under respective jurisdictions of LCs</li> </ul>
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Urban & Storm Water Drainage	<ul style="list-style-type: none"> <li>• Urban drainage systems; Repair &amp; rehabilitation of Drains and flood control systems under respective jurisdictions of LCs</li> </ul>						

	<ul style="list-style-type: none"> <li>• Covering of exposed street level drainage and sewage channels</li> <li>• Purchase of related machinery and equipment</li> <li>• Public toilets, especially for women</li> <li>• Parks, playgrounds, greenery, recreation facilities, public spaces, street furniture, landscaping, tree plantation – including dedicated areas for women</li> </ul> <p>Health and Education Infrastructure Only for DMCs and Only for grant-year 3 and beyond after obtaining a track record of performance in the above-three investment areas:</p> <ul style="list-style-type: none"> <li>• Rehabilitation of existing Primary Health facilities and school buildings operated by DMCs</li> </ul> <p>Fire and Disaster Management Primarily for KMC:</p> <ul style="list-style-type: none"> <li>• Rehabilitation of Fire control stations and facilities</li> <li>• Purchase of emergency response / disaster management equipment</li> </ul> <p><b><u>Sub-component 1.2: Technical Assistance to Local Government Department &amp; Implementation Support (WB financing: US\$20 million)</u></b></p> <p>The Local Government Department (LGD) of GoS is responsible for regulating, overseeing and managing affairs of all LGs across Sindh, and is the custodian of the Sindh Local Government Act (2013) and its associated regulations which define the scope of LG functions, powers, authorities etc. LGD has substantial control over administrative matters of LGs in the province. This sub-component will support LGD in the following activities: (a) implementing the performance-based grant system for LCs; (b) providing a package of centralized technical assistance (TA) and capacity-building support to assist LCs in achieving the performance conditions, through various consultancy services, Shared Services and backstopping support; (c) administering the entire Annual Performance Assessment (APA) process through an independent private entity which will conduct the APA; (d) centralized assistance to LCs in design of sub-projects and related environment &amp; social management plans, if required and requested by LCs; (e) coordination with LCs on all aspects of this component; and (e) monitoring and progress reporting for this component, and coordinating with other GoS entities on progress reporting for the whole project. Finally, this sub-component will finance a Project Management Unit (PMU) at LGD, including staffing needs; as well as preparatory works and studies which may be considered under future Bank lending projects, including feasibility and design studies and related environment &amp; social management plans.</p>
<p><b>Component-2</b></p> <p><b>Modernizing Urban Property Tax Administration and System</b></p> <p><i>(US\$40 million)</i></p> <p><b>Implementation Agency(s)</b></p> <p><i>Excise &amp; Taxation Department</i></p>	<p>This component will support the implementation of reforms to improve the Urban Immovable Property Tax (UIPT) in Karachi. The objective is to substantially improve Karachi's property tax system and provide a large and stable base of recurrent revenue for the city to finance its service delivery needs. This component will be implemented by the Excise &amp; Taxation Department (E&amp;TD) of GoS, which is the agency mandated for UIPT collection province-wide. Recognizing its potential, GoS is considering devolving UIPT collection to Karachi LCs, specifically DMCs, to improve collection efficiency, transparency and incentives. At the request from GoS, the Bank has developed a road map for the proposed a phased devolution, with initial focus on developing a modern property tax administration system and improving capacity of LCs to prepare them for eventual devolution. The second phase will include legislative and policy reforms, including updating of valuations and devolution. This project will support the implementation of the first phase of the roadmap, and set the base for implementing the second phase.</p> <p>Activities to be financed under this project are summarized as follows:</p> <p>a. A comprehensive all-Karachi property survey, covering an estimated 1.5 to 2 million properties, to update the property tax database and fiscal cadaster. The survey will include all buildings within the jurisdiction of DMCs (i.e. residential, commercial, industrial, government, institutional, special, etc.), and will collect information on ownership and lease status of property parcels, including those owned by public sector agencies, to build a complete database of public sector land assets.</p>

	<ul style="list-style-type: none"> <li>b. Development of an upgraded IT system to house the survey and fiscal cadaster information and provide extensive trainings and capacity building to staff of E&amp;TD to run and operate these ICT systems.</li> <li>c. Training and capacity building of relevant officials of E&amp;TD and LCs, including support for IT systems for LCs.</li> <li>d. Taxpayer sensitization and outreach; and establishment and operation of a Project Management Unit (PMU) at E&amp;TD, including finance personnel costs.</li> <li>e. Support for implementation of a revised institutional structure for UIPT, including any consultancies to review UIPT legislations or regulations.</li> </ul>
<p><b>Component-3</b></p> <p><b>Improvement of City Competitiveness and Business Environment</b></p> <p><i>(US\$20 million)</i></p> <p><b>3.1 Establishment of Sindh Business Facilitation One Stop Shop (OSS)</b></p> <p><b>3.2 Assistance to Setup a PPP Node at LDG</b></p> <p><b>Implementation Agency(s)</b></p> <ul style="list-style-type: none"> <li>i) LGDs</li> <li>ii) Sindh Investment Dept.</li> </ul>	<p><b><u>Sub-component 3.1: Establishment of Sindh Business Facilitation One-Stop-Shop (OSS)</u></b> <b><u>(WB financing: US\$17.5 million)</u></b></p> <p>This sub-component will support the recently-established Sindh Investment Department (SID) of GoS to deliver on its mandate of creating a more conducive business environment for the private sector. SID has been given a strong and broad mandate by the Chief Minister to spur increased private investment in Sindh in general and Karachi in particular, and a high-level working group oversees its operations and monitors its progress in implementing Sindh's Doing Business reforms agenda. It will finance the establishment of a Sindh Business Facilitation One-Stop-Shop (OSS), to be owned and maintained by the SID. The OSS system will serve as a single interface between investors / businesses and key regulatory agencies. It will facilitate the process of application submission, fee payment and processing for business registration and licenses/permits, and make the processes electronic. The following specific activities will be supported:</p> <ul style="list-style-type: none"> <li>a. <b><u>Regulatory Process Mapping and Simplification:</u></b> In Phase 1, three key agencies / regulatory bodies with mandates on business registration and operations will be identified and supported through the following: a) preparation of a comprehensive register of business licenses, permits and approvals within their mandate; b) mapping of all business processes associated with these licenses; c) proposing re-engineering of redundant / outdated / duplicate processes and fees ; and d) preparation of Standard Operating Procedures (SOPs) framing the re-engineered processes. In phases 2 and 3, additional three key agencies / regulatory bodies will be identified, and the same steps as under Phase 1 will be repeated. Nine agencies will be covered in total.</li> <li>b. <b><u>Design and Implementation of the OSS:</u></b> This activity will be implemented in tandem with each of the phases listed above. In each phase, SID will work with the agencies to automate their new Standard Operating Procedures (SOPs) and then integrate these automated processes into the OSS. The project will build the capacity of SID to carry this work forward and expand the scope of the OSS. SID has recently launched a Sindh Business Registration Portal to serve as an online regulatory approvals interface (under the Bank-financed KNIP). The proposed OSS will upgrade this Portal to evolve into the Karachi Business Facilitation OSS, to enable not only to streamline business registration, but also to facilitate approvals, licenses and permits for ongoing business operations.</li> </ul> <p><b><u>Sub-component 3.2: Assistance to Setup a PPP Node at LGD (WB financing: US\$2.5 million)</u></b></p> <p>This sub-component will support the establishment of a Public-Private Partnership (PPP) node at LGD. The node will serve as the secretariat and PPP origination arm of all agencies operating under LGD and will lay the foundation of an enabling framework for private provision of public services and infrastructure. Once operationalized, the Node will be responsible for the following indicative activities, amongst others:</p> <ul style="list-style-type: none"> <li>a. Assist key local-level agencies in developing comprehensive asset inventories for capital assets. These asset inventories will help develop the balance sheets of respective LGs and agencies, and help identify key assets which may subsequently be developed through PPPs. It may also inform the design of pre-feasibilities.</li> <li>b. Undertake pre-feasibility studies, in consultation with the PPP Unit in the Finance Department of GoS, for potential PPPs in municipal services, stemming from investment needs of local-level agencies. The pre-feasibility studies will give an early stage options analysis of potential projects and contain requisite information for agencies to approve the preparation of comprehensive project proposals.</li> </ul>

<p><b>Component-4</b></p> <p><b>Technical Assistance for Solid Waste Management</b></p> <p><i>(US\$ 10 million)</i></p> <p><b>Implementation Agency(s)</b></p> <p><i>SSWMB under LGD</i></p>	<p>The project seeks to provide broad strategic sectoral support to GoS for SWM for the city through technical assistance (TA), seeking the transformation of Sindh Solid Waste Management Board (SSWMB) into a fully functional and efficient entity, and supporting the preparation of comprehensive planning documents for the sector. The objective of the proposed TA is to improve the overall performance of SWM through a set of targeted activities addressing critical sector challenges and help contribute to the formulation of a comprehensive investment strategy. This component will be implemented by SSWMB. This component will finance the following activities:</p> <ol style="list-style-type: none"> <li>a. <u>Enhancing Efficiency and Effectiveness of the Solid Waste Sector</u>, including: (i) technical, environmental and social baseline study for existing dumpsites (Jam Chakro and Gond Pass), (ii) Pre-feasibility study for the development of additional transfer and advanced treatment capacity, (iii) preparation and adoption of a Waste-to-Energy strategy for Karachi, (iv) mapping of current collection system and collection optimization study including route optimization , and (v) study of the informal waste sector, including sorting and recycling practices.</li> <li>b. <u>Upstream Policy Development</u>, including an overall sector review, identification of cost recovery mechanisms, as well as policies and regulations targeting manufacturing and delivery systems to eliminate or drastically minimize non-recyclable products and packaging to help reduce plastic waste leakage, and manage hazardous waste streams.</li> <li>c. <u>Community Level Activities and Job Creation</u>, focusing on ensuring continuous community engagement and community-level job creation in the SWM sector, including supporting steps for the professionalization of the waste sector.</li> <li>d. <u>Capacity Strengthening of SSWMB</u>, including, among others (i) organizational review, (ii) comprehensive training, and acquisition of tools and technology for enhanced management of services, (iii) mobilization of in-house TA to support timely implementation of the project, and (iv) data management and improved M&amp;E for better sector performance, including waste characterization study and upgrading of the existing M&amp;E system at the SSWMB, and a comprehensive economic, environmental and social study of the waste sector in Karachi.</li> </ol>
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## 3.0 ENVIRONMENTAL BASELINE

This chapter describes the environmental baseline of the entire area for the proposed project/subprojects including physical, biological, socioeconomic conditions and cultural aspects relevant to CLICK.

### 3.1 Physical Environment

The map of the Karachi is presented in Figure 1.

Figure 1: Map of Karachi



#### 3.1.1 Climate

Karachi is located just above the tropical zone on the coast of the Arabian Sea at 24°45" to 25°15" north, and 66°37" to 67°37" east at about 20 m above sea level (airport weather station). Karachi is bounded by Hub-River (Balochistan Province) on West, Badin District on East, Dadu District on North and Arabian Sea on South. The climate of the Karachi can be characterized by dry, hot and humid conditions and in general terms it is moderate, sunny and humid. There is a minor seasonal intervention of a mild winter from mid-December to mid-February followed by a long hot and humid summer extending from April to September, with monsoon rains from July to mid- September. The level of precipitation is low for most of the year. Karachi also receives the monsoon rains from July to September. The humidity levels usually remain high from March to November, while very low in winter as the wind direction in winter is North Easterly.

#### 3.1.2 Temperature

Table 2 and Figure 2 show the maximum, minimum and average monthly temperatures of the Karachi for the recent years (2016-2019). The maximum temperature range is 25 – 37 °C. The average temperature range is 21 - 33 °C. The minimum monthly temperature range is 18 – 30 °C.

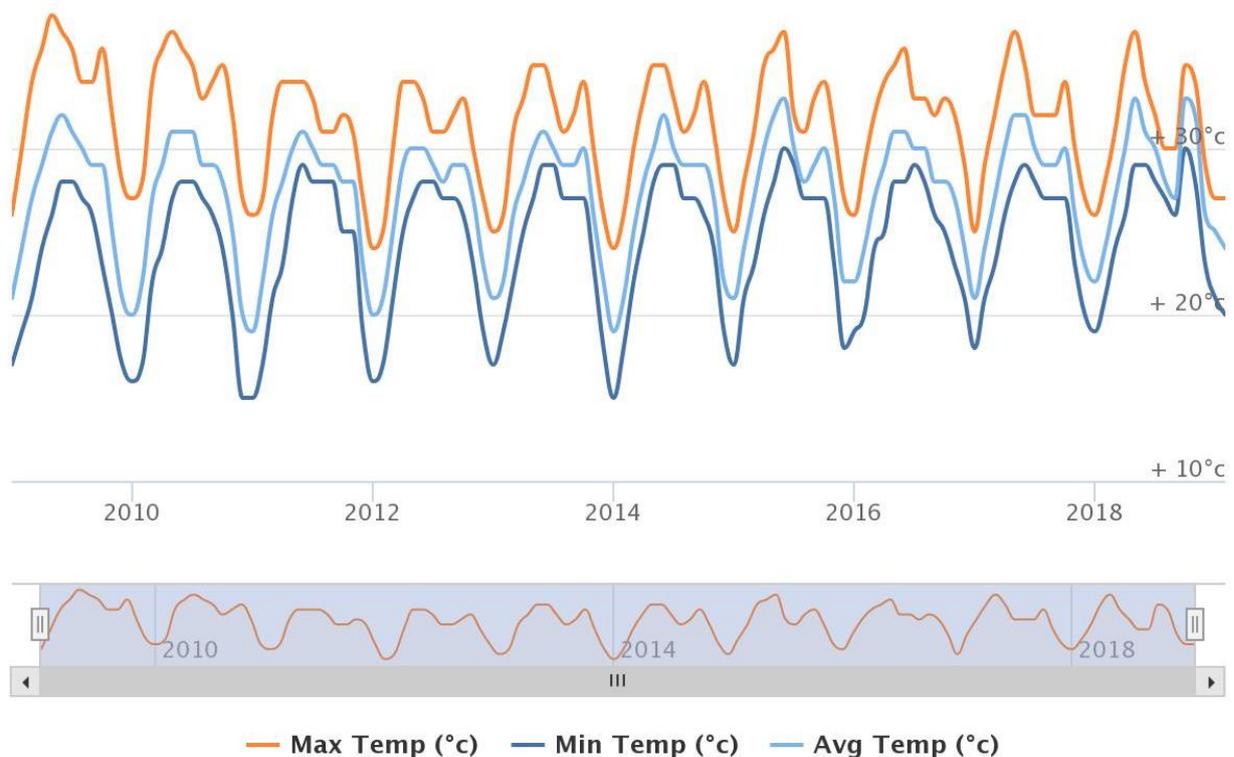
April to November are the hot months whereas cold months are December to March.

Table 2: Maximum, Minimum and Average Temperature (Karachi)

Year	Month's Temperature C°											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2016</b>												
Max	26	29	32	34	35	36	33	33	32	33	32	29
Avg	22	24	27	29	31	31	30	30	28	28	27	24
Min	19	20	24	25	28	28	29	28	26	25	23	21
<b>2017</b>												
Max	25	29	32	35	37	35	32	32	32	34	30	27
Avg	21	24	27	30	32	32	30	29	29	30	26	23
Min	18	21	23	26	28	29	28	27	27	27	23	20
<b>2018</b>												
Max	26	28	31	35	37	34	32	30	30	35	34	29
Avg	22	24	27	30	33	31	30	28	27	33	32	26
Min	19	21	24	26	29	29	28	27	26	30	28	23
<b>2019</b>												
Max	27	27	-	-	-	-	-	-	-	-	-	-
Avg	25	24	-	-	-	-	-	-	-	-	-	-
Min	21	20	-	-	-	-	-	-	-	-	-	-

Source: Extract from Temperature Graph (World Weather Online)

Figure 2: Maximum, Minimum and Average Temperature (Karachi)



Source: World Weather Online (<https://www.worldweatheronline.com/karachi-weather-history/sindh/pk.aspx>)

### 3.1.3 Rainfall

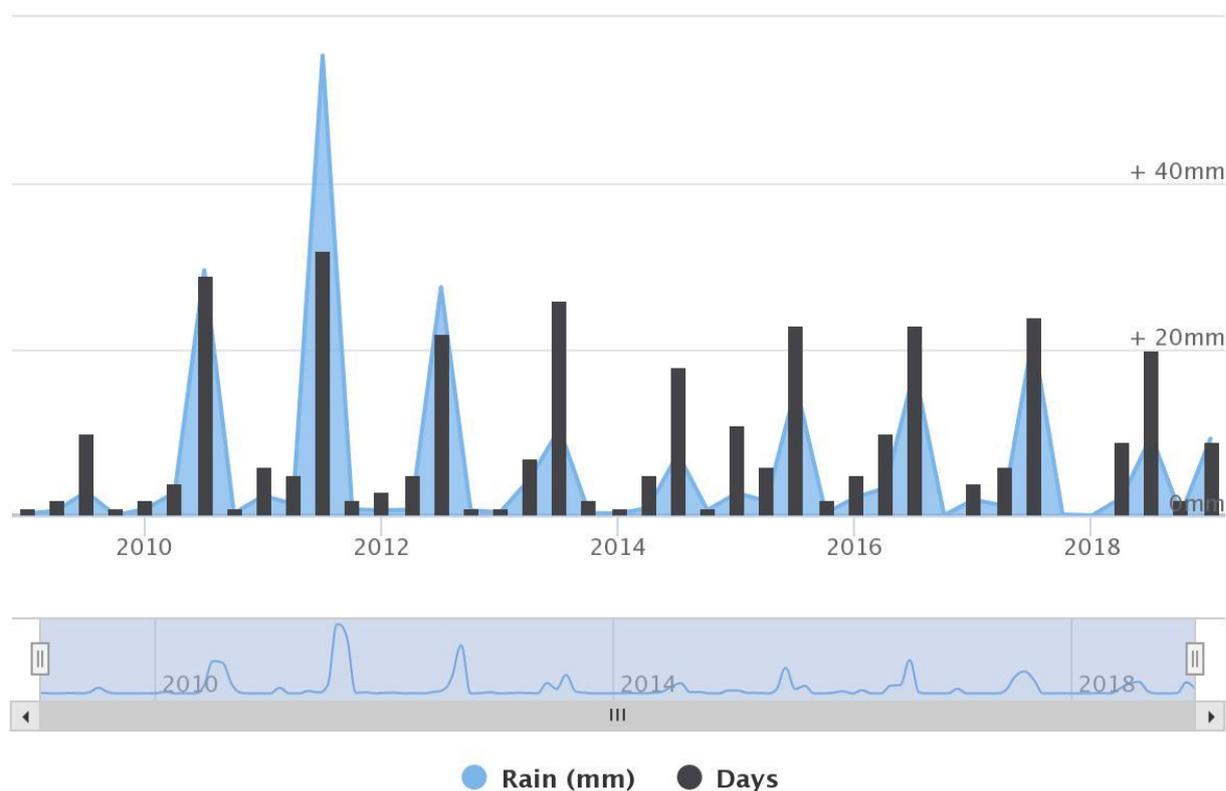
As this region falls in the semi-arid climatic zone, the rainfall in Karachi is extremely low and erratic. Table 3 and Figure 3 show the average monthly rainfall data of Karachi.

Table 3: Average Rainfall of Karachi (mm)

Year	Month's Average Rainfall (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	2.63	0.0	3.9	0.11	0.09	9.71	10.23	41.09	1.2	0.01	0.0	0.1
2017	5.61	0.03	0.1	0.01	0.06	3.47	20.4	27.17	16.92	0.0	0.14	0.22
2018	0.01	0.0	0.04	0.53	0.0	5.92	11.86	14.31	2.53	0.0	0.0	0.4
2019	13.7	4.8	-	-	-	-	-	-	-	-	-	-

Source: Extract from Rainfall Graph (World Weather Online)

Figure 3: Monthly Average Rainfall (mm) and Number of Rainy Days of Karachi



Source: World Weather Online (<https://www.worldweatheronline.com/karachi-weather-history/sindh/pk.aspx>)

### 3.1.4 Humidity

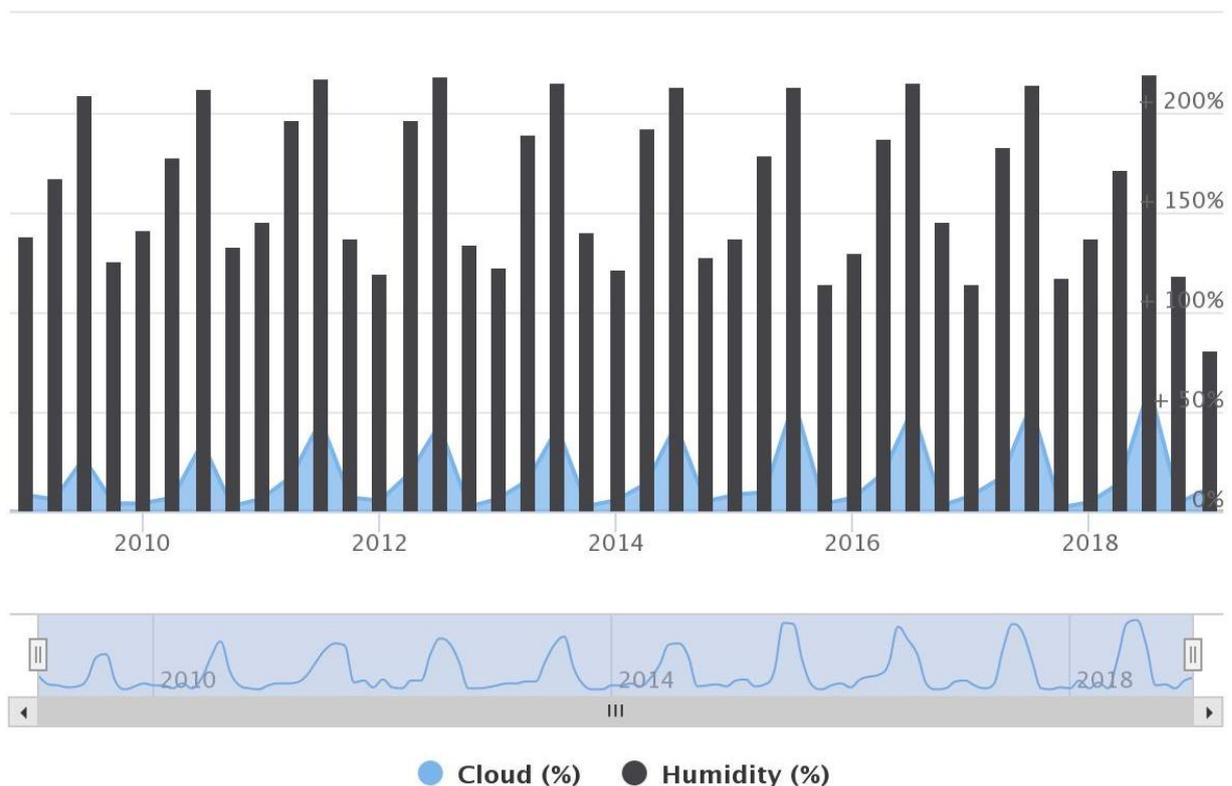
Despite arid conditions, humidity is relatively high throughout the year. Table 4 and Figure 4 present detail of the average monthly humidity of Karachi.

Table 4: Average Humidity (%) of Karachi (mm)

Year	Month's Average Humidity (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	48	33	49	54	66	67	72	73	71	63	39	44
2017	37	29	49	52	63	68	74	72	69	55	38	25
2018	42	45	50	51	52	69	73	75	72	47	37	35
2019	42	39	-	-	-	-	-	-	-	-	-	-

Source: Extract from Humidity Graph (World Weather Online)

Figure 4: Average Humidity and Clouds (%) of Karachi



Source: World Weather Online (<https://www.worldweatheronline.com/karachi-weather-history/sindh/pk.aspx>)

### 3.1.5 Wind

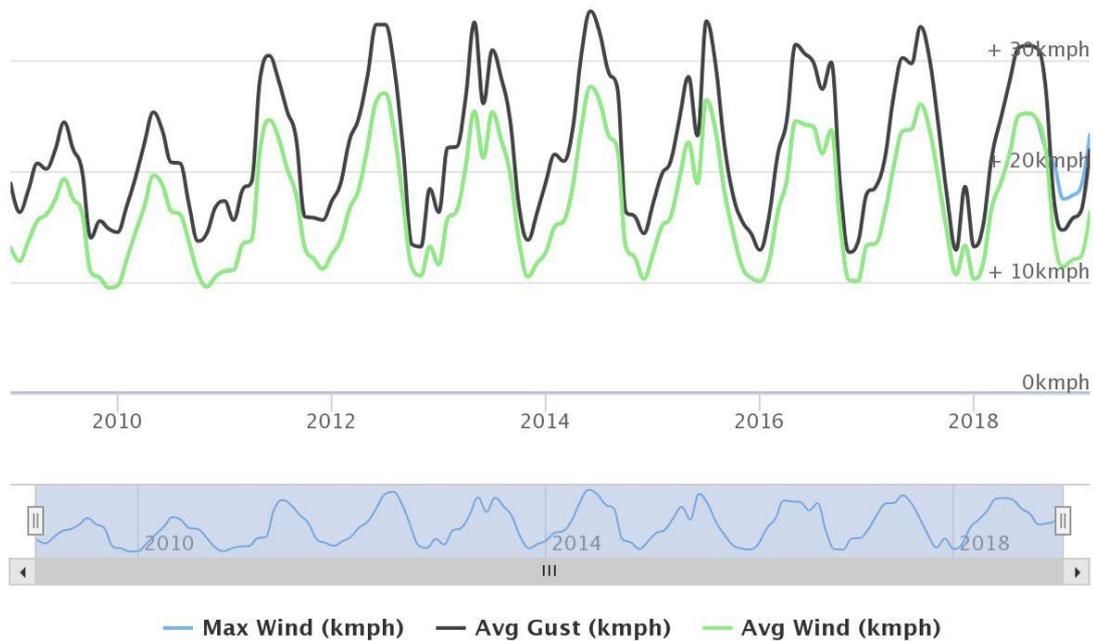
Karachi weather is considered pleasant and is famous for its breeze from the sea. The onshore winds from the Arabian Sea contribute to humid conditions. The wind speed has highest velocities during the summer months, when the direction is south-west to west. During winter, the wind blows from north to northeast, shifting southwest to west in the evening hours. The wind usually carries sand and salt resulting in severe wind erosion and corrosion. Tropical cyclones are formed in the Arabian Sea in the pre-monsoon season, mostly in the month of June. Table 5 and Figure 5 show the maximum and average monthly wind speed of Karachi. Figure 6 shows the wind rose for Karachi.

Table 5: Maximum and Average Wind Speed (kmph) of Karachi

Year	Month's Wind Speed (kmph)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2016</b>												
Max	10.1	11.7	16.3	19.1	24.5	24.2	24	21.6	23.7	15.3	10.2	10.1
Avg	10.1	11.7	16.3	19.1	24.5	24.2	24	21.6	23.7	15.3	10.2	10.1
<b>2017</b>												
Max	13.3	13.5	16.2	20.4	23.6	23.8	26	23.8	19.4	14.4	10.7	13.3
Avg	13.3	13.5	16.2	20.4	23.6	23.8	26	23.8	19.4	14.4	10.7	13.3
<b>2018</b>												
Max	10.3	11.6	16.7	18.9	21.6	25	25.2	24.7	22.1	20.6	17.5	17.8
Avg	10.3	11.6	16.7	18.9	21.6	25	25.2	24.7	22.1	13.9	11.4	12
<b>2019</b>												
Max	18.6	23.3	-	-	-	-	-	-	-	-	-	-
Avg	12.3	16.3	-	-	-	-	-	-	-	-	-	-

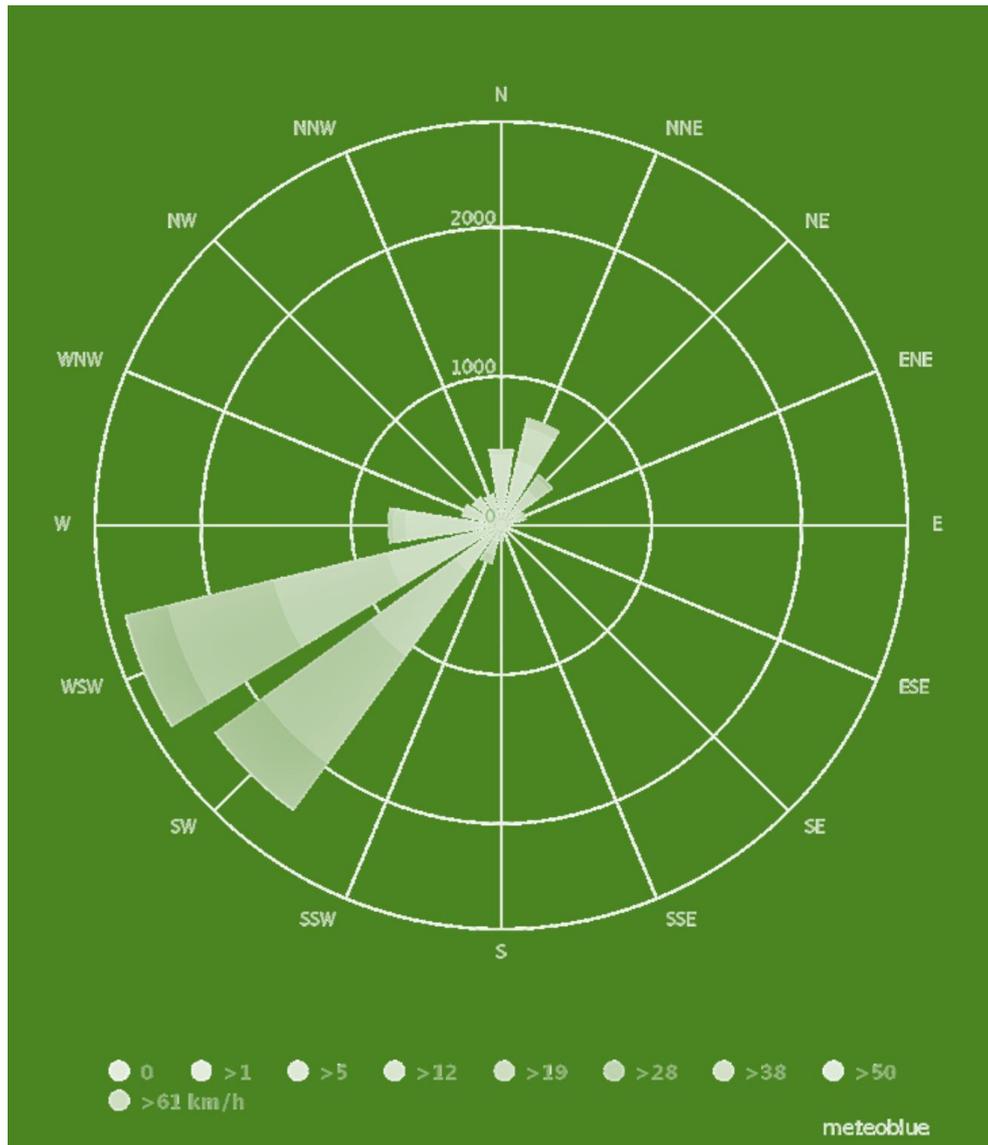
Source: Extract from Wind Graph (World Weather Online)

Figure 5: Monthly Average and Maximum Wind Speed and Gust (kmph) of Karachi



Source: World Weather Online (<https://www.worldweatheronline.com/karachi-weather-history/sindh/pk.aspx>)

Figure 6: Wind Rose of Karachi



Source: Pakistan Meteorological Department

### 3.1.6 Topography

Karachi is located in the south of Sindh, on the coast of the Arabian Sea. It covers an area of approximately 3,600 km<sup>2</sup>, comprised largely of flat or rolling plains, with hills on the western and northern boundaries of the urban sprawl. The city represents quite a variety of habitats such as the sea coast, islands, sand dunes, swamps, semi-arid regions, cultivated fields, dry stream beds, sandy plains, hillocks. The hills in Karachi are the off-shoots of the Kirthar Range. All these hills are devoid of vegetation and have wide intervening plains, dry river beds and water channels.

Classified according to physiographic features, Karachi City District can be divided into three broad categories: Hilly Region (Mountain Highland), Alluvial Plain (Piedmont Plain) and Coastal Areas (Valley Floor). The greatest height of the region is 76 m that gradually decreases to 1.5 m above mean sea level along the coastline. The Karachi Harbor is a sheltered bay to the south-west of the city, protected from storms by the Sandspit Beach, the Manora Island and the Oyster Rocks.

The Arabian Sea beach lines the southern coastline of Karachi. Dense mangroves and creeks of the Indus delta can be found towards the south east side of the city. Towards the west and the north is Cape Monze, an area marked with projecting sea cliffs and rocky sandstone promontories.

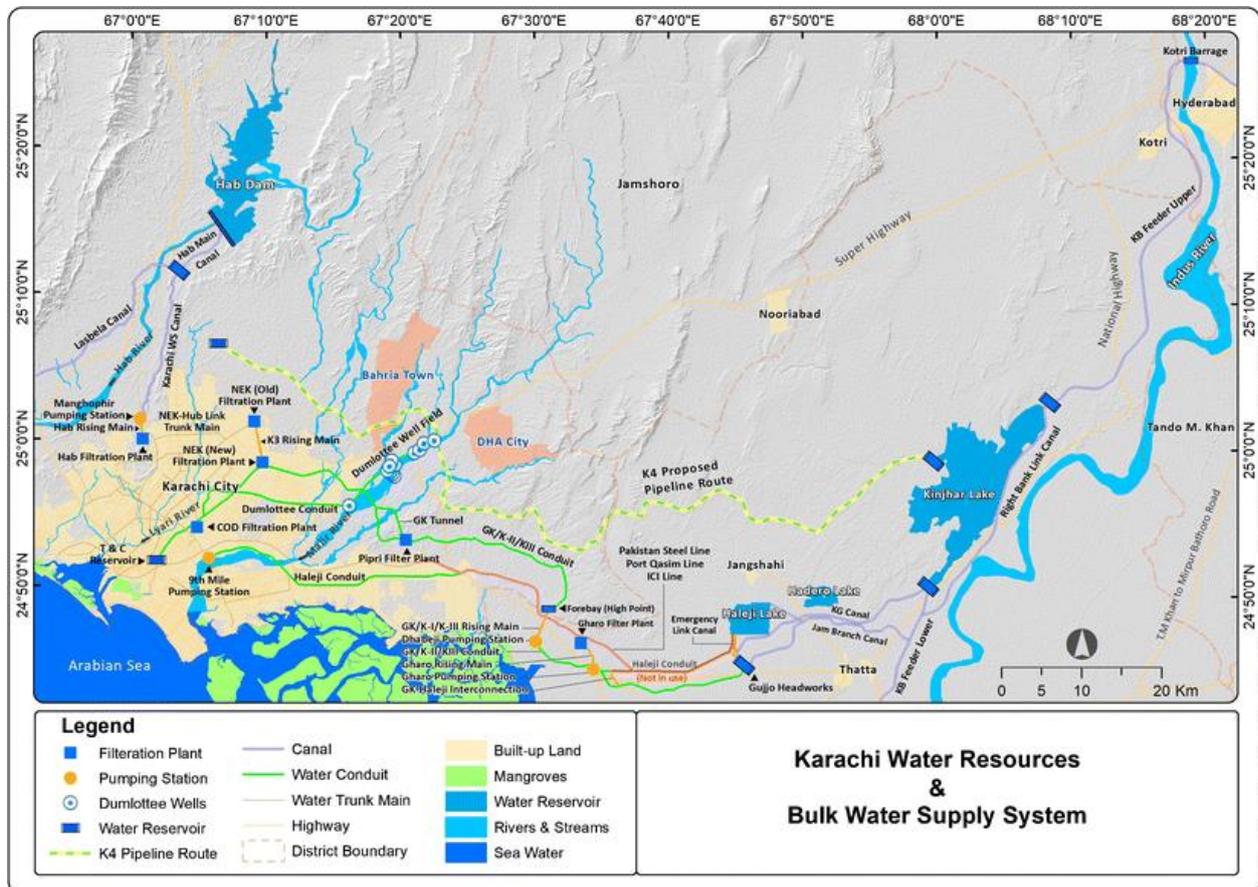
Karachi is the part of major synclinorium stretching from Ranpathani River in the east to Cape Monze in the west, Mehar and Mole Jabal (Mountains) in the north. Within the synclinorium, a number of structures such as Pipri, Gulistan-e-Jauhar, Pir Mango and Cape Monze are exposed. The presence of concealed structures under the Malir River valley, Gadap and Maripur plains can fairly be deduced. Rock aggregates, sand, limestone and clay are some of the potentials for gainful utilization. Gulistan-e-Jauhar, member of the Gaj formation, offers groundwater potential for limited use. The area is underlain by rocks of sedimentary origin ranging in age from Eocene to Recent.

A large portion of the Karachi area consists of vacant land including the area dedicated to the Kirthar National Park. The vacant land accounts for only 7% of all land and housing is the biggest user of land (with about 37% of the total), while roads and open spaces are also significant. Most of the developed areas are concentrated in the inner ring towns of Saddar, Jamshed, Lyari, Liaquatabad, Gulshan-e-Iqbal and Gulberg. These towns contain the diverse mix of land uses and include most of the governmental and regional-scale industrial and commercial activities.

### 3.1.7 Water Resources

The map of water resources and bulk water supply system for Karachi is shown in Figure-7.

Figure 7: Water Resources & Bulk Water Supply System of Karachi



The description of the water resources of Karachi is as under:

#### **a) Surface Water**

Indus River and Hub Dam on Hub River are the two major sources of surface water for Karachi.

##### **1. Indus River:**

The Indus River, the main source of water for Karachi, is severely constrained by dry season demand, but has abundant wet season discharges. Except during the summer flood season, very little water escapes to the sea. Water from the Indus River is distributed over the Sindh Province through three barrage systems, namely, Guddu, Sukkur and Kotri. Urban and industrial water for Karachi is taken from the Kotri Barrage and discharged through the Kalri Baghar Feeder Upper (KB Feeder Upper) to Kinjhar Lake. Kotri Barrage is the lowest barrage on the River Indus. Kinjhar Lake is a natural reservoir, the storage of which has been increased by constructing nearly 20 km of embankments having a maximum height of 9 m. The lake has a catchment area of 910 km. The supply from the River Indus comes via canals from Kinjhar, Haleji, Gharo and through conduits to the Dhabeji pumping station. The water is then distributed via conduits and distribution mains.

##### **2. Hub Dam**

The Hub Dam is a multi-purpose dam (municipal, industrial and irrigation purposes) constructed on the Hub River approximately 50 km to the north-west of Karachi city. The construction of the dam started in September 1963 and completed after 18 years in September 1981. The catchment area of the dam extends across two provinces namely Sindh and Balochistan, covering a total area of 8,730 km. There has been an agreement between the two provinces that, at the Regulator located at the end of the Hub Main Canal, 63.3% of the total flow from the dam will be diverted to the Karachi Water Supply Canal (Sindh) while 36.7% to the Lasbela Canal (Balochistan).

##### **3. Groundwater**

Ground water resources in Karachi are limited. Small amount of groundwater is extracted for private use in the Karachi area. The aquifers close to the coastal belt are mostly saline and unusable for domestic purposes. Aquifers near the Hub River are well developed and serve as sources of water for agriculture and domestic use. The aquifers are estimated to lie at depths of 50-100 m.

Dumlottee Well Field, located on the banks of Malir River in the Dumlottee area about 30 km to the northeast of the city supplies water for few months after the rainy season. The system is almost dry in the rest of the year.

##### **4. Groundwater Recharge Sources**

Five possible water-sources are contributing to the groundwater recharge in Karachi. The first possible source is the rainfall. As the city of Karachi suffers from deficit of precipitation (only rainfall), the contribution to shallow groundwater storage from rain is very little. However, rainfall in the hinterlands and other areas surrounding Karachi may significantly contribute to the groundwater flow-system. The two freshwater sources are the Hub Lake/Hub Dam and the Indus River. Water from Hub Dam and the Indus River is piped to various residential zones in Karachi for drinking and irrigation purposes. The spring water discharges into Malir River and Layari River and

the municipal/industrial waste effluents added to these rivers are also contributing to groundwater storage. Seawater intrusion along Karachi coast is another possible source.

During the past several years, a number of pumping wells has been installed to meet requirements for the irrigation-water supply (to serve vegetable and fruits cultivation, dairy and poultry) and drinking-water supply for Karachi. Excessive pumping of groundwater and continuous lowering of water-table is likely to result in intrusion of seawater into the Malir Basin under natural seepage conditions and under artificially induced conditions of recharge of saline seawater in the coastal aquifer(s) of Karachi.

## **5. Groundwater Quality<sup>21</sup>**

Physico-chemical data of shallow groundwater (depth less than 30 meters) shows that the shallow wells, located in the vicinity of coast and in the proximity of polluted rivers, have relatively higher values of electrical conductivity, salinity and population of coliform bacteria. The shallow groundwater is moderately saline, representing electrical conductivity values in the range of 1.1 to 1.9 mS/cm and salinity in the range of 1 ppt. The pH of shallow groundwater varies from mildly acidic (~6.3) to mildly alkaline values (~7.9). Areas with quite poor sanitary conditions have relatively low values of pH (~6.3 to 6.8). Shallow groundwater below 20 meters is slightly reducing. The dissolved oxygen is in the range of 1.5 to 7.9 mg/l. Turbidity of shallow groundwater varies between 3.6 NTU and 95 NTU. The concentration of HCO<sub>3</sub><sup>-</sup> (356 – 514 ppm, n=4), Cl<sup>-</sup> (82 - 169 ppm, n=4) and SO<sub>4</sub><sup>-2</sup> (38-117 ppm, n=4) in shallow groundwater is very reasonable.

In general, deep groundwater is mostly saline and has high electrical conductivity (range: 1.9-19.1 mS/cm) and salinity (range: 1.7-7.4 ppt), as compared to shallow groundwater. Based on hydro-chemical data of water samples collected from pumping wells, it is assumed that the shallow mixed deep groundwater discharged by large-scale pumping wells mainly represents the deep groundwater from confined aquifer

The hydro-chemical and stable isotope results indicate that the confined aquifer hosts a mixture of rainwater from hinterlands and surrounding regions around coastal Karachi, as well as sea trapped water / seawater, through intrusion under natural infiltration conditions or under induced recharge conditions.

### **b) Water Supply System**

Over the last three decades, Karachi consistently lagged behind in the maintenance and expansion of water supply system, bulk conveyance system, and distribution network as compared to the city demands due to high population growth rate (4 to 5% per annum), low capacity of institutions, and low level of financing. The consequence is the rationing of water supply currently in practice in most of the areas of the city. Water is supplied only once in every two or three days and for the duration of two to three hours at a time. People are obliged to spend money on ground-level tanks, booster pumps, roof-top storage tanks and water filters and even then, all drinking water is boiled. Many households are compelled to use secondary sources of water such as shallow wells or tanker supplies just to meet their basic needs.

The water supply system of the KWSB supplies bulk water to the citizen of Karachi City from the Indus River, Hub Dam and Dumlottee Wells through the Greater Karachi Bulk

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<sup>21</sup> Information in this section is taken from: Geological Survey, Preparatory Survey (II) on Karachi Circular Railway Revival Project, Final Report, JICA, 2013

Water Supply System, Karachi Water Supply Canal and Dumlottee Conduit respectively. About 33% of the total water supply is without filtration. From filtration plants and reservoirs, water is supplied through the water trunk mains and distribution pipelines.

The detail of the water filtration plants is given is Table 6.

Table 3: Detail of Filtration Plants in Karachi

Location	Gharo		COD		Pipri			NEK Old	NEK New	Hub
Number of Plants	1	2	1	2	1	2	3	1	1	1
Year of Construction	1943	1953	1962	1971	1971	1978	2006	1978	1998	2006
Rated Capacity MGD	10	10	70	45	25	25	50	25	100	80

Source: KWSB

A total of 139 distribution pumping stations are being operated and managed by the KWSB. Some of the consumers install individual small suction pumps and suck water from distribution pipes forcibly. This is the one of reasons of serious water supply situation which makes low water pressure and water shortage, and also problems of water quality aggravation such as sewerage contamination caused by negative pressure in the pipes. There is no water meter on individual service connection. Consumers pay water tariff on the basis of plot size hence they pay no attention to any wastage. Awareness for the usage and storage of water is very less in many parts of Karachi. The areas which are not in the service area by any water supply or low service quality, water is supplied by Tank-Cars which belong to private sectors from 10 bases of Bowser Filling Stations in the city area.

### 3.1.8 Sewerage System

Four drainage systems are said to encompass Karachi city, the Lyari, the Malir, the Budnai, and small streams referred to collectively as the coastal basin. The Malir River Basin and the Lyari River Basin contribute about 80% of the surface runoff from the city. Thus, the natural drainage system of Karachi city includes mainly the tributaries of the Malir and Lyari Rivers. While these are perennial streams, in stream flow is intermittent, and fresh water inflow depends on rainfall and runoff; both rivers also intercept discharges from sewer lines and outfalls and carry sewage to the sea from all parts of the city. The Budnai Basin and the Coastal Basin are minor basins. The Malir River flows from the east towards the south and center, and the Lyari River stretches from north of the city to the southwest ending in the Arabian Sea.

Drainage channels collect surface runoff through hundreds of small/large side channels and lined nullahs (drains) that serve as important components of the drainage network. These are generally dry built channels and streambeds that flow into the main rivers described above. Whenever a heavy rain takes place, the huge amount of runoff that course through these channels may cause the rivers to overflow their banks and spread over adjacent floodplains. In any event, the drainage network of the city is severely stressed due to increased runoff from paved surfaces, and encroachment on drainage channels.

The Lyari River is an ephemeral stream having a substantial catchment area starting from as far back as the Badra range of hills, some 100 km north of the city. Its catchment covers an area of 700 km<sup>2</sup>, out of which, approximately 150 km<sup>2</sup> is in the metropolitan area. The river is the main contributor to an estimated amount of 200 MGD of sewage that enters the Arabian Sea. A large number of industries including leather tanning units, pharmaceuticals, petrochemicals, refineries, chemical, textile, paper and pulp, engineering works and thermal

power stations, located along the river, regularly discharge their untreated industrial waste, including the waste flows from the SITE industrial estate in Orangi that flows via the Orangi Nullah to the Lyari and thence to the ocean.

Malir River is shorter with a smaller drainage area. It is ephemeral and is constituted from two major tributaries, the Mol and Khadeji, as well as some minor tributaries. Khadeji is a perennial stream that originates at Khadeji falls and gains flow as it travels across the Malir Basin. The Malir and Khadeji River basins include dry hill torrents and flow depends upon precipitation during rains. Once the Malir enters urban space, it receives large amounts of industrial effluent from the Korangi industrial area, and discharges into the sea.

The wastewater quality of Malir and Lyari rivers is given in Table 7.

Table 4: Wastewater Quality of Malir and Lyari Rivers

Parameters (mg/l) except pH	Malir	Lyari (Mean Values)
pH	7.41 - 8.45	7.49
Temperature °C	32 - 33	27
Total Dissolved Solids (TDS)	1,478 – 33,820	2,361
Biochemical Oxygen Demand (BOD)	180 – 320	343
Chemical Oxygen Demand (COD)	506 – 1,413	552
Zinc	0.6 – 1.39	0.32
Lead	2.19 – 6.77	0.23
Cadmium	1.71 – 2.6	0.12

Source: Physico-Chemical Profile of Malir River and Chinna Creek (Sadia Tariq et al.), Impact of Orangi Nala Industrial Effluents on Sewage Water of Lyari River, Karachi, Pakistan (Yasmin Nergis et al.)

The existing coverage of the sewerage system is only about 30% for the Karachi. The existing sewerage system has a number of problems. These include low sewage flows received at existing sewage treatment plants, resulting from the inadequate provisions of sewer trunk mains and the malfunctioning of pumping facilities, deterioration of water quality in rivers and canals, and clogging of waterways caused by damping of massive rubbish. The detail of the sewage treatment plants is given in Table 8.

As per KSDP 2020, more than 380 MGD wastewater is discharged daily. Only 90 MGD is treated at existing wastewater treatment plants. According to KWSB sources, almost 441MGD raw sewage gets into the sea without required level of treatment from Karachi via 11 drains. Existing sewerage facilities for sewage collection and its treatment are far from sufficient in quantity to serve the large population of Karachi city. Additional sewage collection system including branch sewers, trunk sewers and pumping stations need to be constructed to improve living environment of the citizen. In the same manner, existing sewage treatment plants need to be extended and new plant(s) has to be implemented to treat all the generated sewage to improve water qualities of public water bodies, especially of Arabian Sea.

Table 5: Summary of Sewage Treatment Plants of Karachi

	TP-1 (SITE)	TP-2 (Mahmoodabad)	TP-3 (Mauripur)
Drainage Area	F.B. Area, Liaquatabad, Nazimabad & North Nazimabad, Part of Orangi Town, Pak Colony etc.	Old City Areas, Clifton Societies, Mahmoodabad, Part of Azam Basti, Dada Bhai, Saddar, Malir	Old Lyari, Garden East and West, Gulshan-e-Iqbal, PIB Colony, Soldier Bazar, Baldia, Nazimabad, North Karachi
Site Area	120 acres (48.6 ha)	120 acres (48.6 ha)	545 acres (221 ha)
Year of Construction	1960/1995 (rehabilitated)	1960/1996 (rehabilitated)	1998

Treatment Process	Trickling Filter Process	Trickling Filter Process	Anaerobic + Facultative Pond
Capacity (MGD)	51	46	54
Present Flow Rate (MGD)	25	24	30-35
Effluent Quality	BOD 80.8 mg/l SS 76.4 mg/l	BOD 100 mg/l	BOD 75 mg/l SS 69 mg/l

Source: KWSB

### a) Industrial Wastewater Pollution

Emission of untreated effluent from industries that do not meet the Sindh Environmental Quality Standards (SEQS) result in considerable environmental pollution and degradation. Untreated wastewater from most of the polluting industries does not comply with the SEQS. There are about 24 large and small industrial complexes in the province. The industrial estates of Karachi, namely Sindh Industrial Trading Estate (SITE), Landhi Industrial Trading Estate (LITE), Korangi Industrial Area (KIA), and West Wharf Industrial Area, among others, discharge effluents mainly into the Lyari and Malir rivers, which, passing through mangroves of Korangi Creek, finally drain into the Arabian Sea. SITE represents about 50% of the industrial discharges into sea.

Many of the above mentioned industrial estates intend to or are in the process of establishing large scale effluent treatment plants. The larger industrial zones include SITE (north), Landhi Industrial Estate (east), Korangi Industrial Area (south), Hub (west, between Karachi and Gadani, technically outside Karachi). The other fast growing industrial areas include Port Qasim Industrial Area, North Karachi Industrial Area, FB Industrial Area, SITE Superhighway etc., besides a number of industrial units operating in residential areas. Due to paucity of land, capital and technical resources, very few industrial units have installed individual wastewater treatment plants. Therefore, almost all of the industrial effluent goes into the sea practically untreated.

The major sources of pollution in coastal waters are: indiscriminate discharges of untreated industrial and domestic effluent, shipping traffic, mechanized fishing fleet and oil terminals at Karachi harbor. An estimated 90,000 tons of oily discharge is pumped out within port limits annually. Currently, almost 100% of the country's shipping cargo is handled at the two ports of Karachi. Eight heavy metals (As, Cd, Co, Cr, Cu, Hg, Ni, Pb, Zn) have been found to be accumulating in coastal fauna.

Untreated wastewater is one of the major source of surface and groundwater contamination. Major infectious diseases outbreaks were sourced by the contamination of fresh water resources. The drains in Sindh are part of an irrigation system and were specifically constructed to drain subsoil water, control waterlogging and salinity, and carry the surface runoff from surrounding lands. They mostly discharge to the rivers and sea. Most sewage flows into the nullahs and rivers which run as open sewers through the urban area, causing highly obnoxious, insanitary conditions with serious health risks and unpleasant environment for the residents of adjoining neighborhoods.

There are numerous unauthorized settlements along most of the sewage channels where poor segments of society live. These are vulnerable to being exposed to water borne diseases, especially children. Besides causing health impacts, sewage overflow also damages already dilapidated infrastructure of Karachi, particularly roads.

Mangroves are under stress due to industrialization, decreased freshwater discharges, and urban sprawl. Major functions of mangroves are: protection of inland areas from the

effects of climatic stress, breeding and spawning of marine fisheries, and livelihood to the coastal communities. Major issue is the depletion in mangrove cover, which is going down both in quantity and quality. The industrial units propping up along the coast, especially in the Port Qasim Industrial Area, often cut sizable numbers of mangroves. However, very low real effort is visible in alternative and compensatory plantation of mangroves, as promised by proponents during environmental approval process. Furthermore, with declining quality and quantity of fish catch, the fisher-folk is opting to other means of livelihood, thereby reducing their traditional economic reliance on mangroves. This results in cutting of mangroves by the local communities as well, especially during fuel shortage.

The heavy metal accumulation (especially Pb) in seafood is linked to anemia, kidney failure and brain damage in humans. Other major impacts of marine pollution as seen in Karachi include loss of biodiversity, dislocation of coastal communities, loss of livelihood, loss of fisheries, and degradation of beaches and recreational places.

### **3.1.9 Flooding**

Climate of Karachi is semi-arid and rainfall is low and highly variable. Torrential rains and heavy rainfall mostly occur in the month of June under the effect of tropical storms. Torrential and heavy rains rarely affect coastal areas but cause flooding within the city. As the result of a tropical storm (6 June 2010) Karachi received 130 mm rain within a day which caused huge surface runoff. The heavy monsoon rain mostly occurs in July and August and is the main cause of flooding in the city. However, its reoccurrence is estimated to occur at between about 3 to 5-year intervals. Flood affected areas of the city and areas susceptible to flooding include the old city areas such as Kharadar, Mithadar, Bunder Road, Ram-swami and Arambagh.

### **3.1.10 Seismology**

Karachi is located in a moderate earthquake zone. Pakistan falls into three seismic zones. Zone-III is the most severe and Zone-I the least. The Karachi Building Control Authority has placed Karachi in Zone-II. Based on the actual events, past observations of fault movement and other geological activities, Karachi is situated in a region where moderate earthquakes may occur of magnitude 5.0 to 6.0 equivalent to intensity between VII and VIII on Modified Mercallis Scale (M).

On the basis of earthquakes experienced from 1970 to 2005, four seismically active zones have been identified in and around Karachi. One seismic zone lies to the west of Karachi, called Ornach Nal Fault merging into the regional Chaman Fault. The zone extends southwest into the Arabian Sea and is aligned with the submarine Murray Ridge; to the north it extends towards Uthal-Bela areas. No large earthquake is known historically on the Ornach Nal system.

The second seismic zone follows the south-eastern margin of Kirthar Range from the north to the south, swinging ultimately towards the southwest. This zone includes Thanu Bula Khan, Lakhra, Jhimpir, Jungshahi, Thatta and areas further south. The third zone passes across the eastern vicinity of Badin in the northeast-southwest direction along the eastern margin of the Indus Delta. The fourth seismic zone straddles the Pakistan-India border. Earthquakes of low to moderate magnitudes — 3.1M to 4.0M and 4.1M to 5.0M — dominate in these zones. Quakes of higher magnitudes (above 5.0M) take place to the southeast in the Rann of Kutch, which is a known high-risk area. Records show that earthquakes of low to moderate magnitudes have occurred in the zones of Murray Ridge-Sonmiani-Uthal, south-eastern Kirthar, and Badin. Moderate magnitude earthquakes in Jangshahi, Thatta, Jhimpir and Thanu Bula Khan Area produce low to moderate intensity shocks in Karachi, as experienced in 1985.

The seismic zoning for Karachi was revised after the 2005 earthquake. Probabilistic Seismic Hazard Assessment (PSHA) carried out for revision of seismic provisions of the Building Code of Pakistan shows that Karachi falls in Zone 2B. The Zone 2B has Peak Ground Acceleration (PGA) in the range of 0.16 g to 0.24 g for a return period of 475 years and is considered to be at 'Moderate' risk of a major earthquake event.

### 3.1.11 Ambient Air Quality

World Health Organization (WHO) included Karachi amongst the top 20 polluted cities of the world with respect to outdoor ambient air pollution levels measured as PM10 and PM2.5. Annual mean concentrations of PM10 and PM2.5 in Karachi are 273 µg/m<sup>3</sup> and 117 µg/m<sup>3</sup>, respectively.<sup>22</sup> WHO revised standard for safe concentration levels for PM10 is 20 µg/m<sup>3</sup> and for PM2.5 is 10 µg/m<sup>3</sup>. In Karachi, PM10 concentration level is about 14 times and PM2.5 concentration level is about 12 times higher than the WHO standards. Highest level of PM2.5 concentration happens during November to February due to reduced wind speed. During this period, PM2.5 concentrations reach in the range of 120–180 µg/m<sup>3</sup> (12-18 times the WHO standards). In 2007, Encyclopedia of Earth, ranked Karachi as the most polluted city in terms of Total Suspended Particulates (TSP), and fourth most polluted mega city according to the multi-pollutant index ranking.<sup>23</sup> In Karachi, the concentration levels of carbon monoxide (CO), oxides of nitrogen (NOx), and sulfur dioxide (SO<sub>2</sub>) are within the permissible limits established by US EPA. The concentrations of hydrocarbons (HC) are higher than the permissible limits (0.25-2.8 as compared to 0.24 permissible limits).<sup>24</sup> Higher level of air pollution has resulted in substantial increase in respiratory tract infection. Major contributors towards air pollution in Karachi are vehicular traffic, industry and ambient dust.

## 3.2 Biological Environment

### 3.2.1 Flora

Karachi can be divided into following four sections with respect to flora and fauna of the area:

- Eastern Boundaries
- Southern Boundaries
- Northern Boundaries
- Western Boundaries

Eastern Boundaries: Malir river and its adjoining sites in the east are densely populated with wide variety of vegetation in the form of natural foliage consisting diversity bushes, shrubs, trees including agricultural products such as crops, vegetables and fruits. This section is extended from Memon Goth till Shah Faisal Korangi vicinities besides Malir river. The wild Kekar, Neem and Oak trees are also found here.

Southern Boundaries: Southern boundaries of Karachi city are surrounded by rocky and barren mountains which are very hot in summer and are grown mostly by diversity vegetation characteristic of Sindh region including bushes, shrubs, and wild Kekar trees. Most vegetation are shade less trees which are selectively consumed by domesticated animals such as goats etc. At some areas, commercial vegetables are also grown but large areas are unproductive.

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<sup>22</sup> WHO, "Public Health, Environmental and Social Determinants of Health: Ambient (Outdoor) Air Pollution in Cities Database 2014".

<sup>23</sup> Gurjar Bhola R., "Air Quality in Megacities", The Encyclopedia of Earth", September 2014

<sup>3</sup> ibid 1

Northern Boundaries: Northern boundaries of Karachi city are surrounded by High Seas of Indian Ocean which starts from Bin Qasim area up to Manora, Keamari and consisting large variety of Mangrove vegetation in the coastal corridor. Mangroves are natural vegetation located usually besides shoreline in closed seas and are significant sanctuaries and breeding places for wide variety of aquatic organisms.

Western Boundaries: Western boundaries of Karachi city are surrounded also by High Seas of Indian ocean as well as stationery sea water referred to as closed sea. It virtually consisting of West Wharf and nearby coastal areas including Hawksbay and Mauripur sections. Most of this region consisting large variety of Mangrove vegetation in the coastal corridor.

Ecological risk of high order has been induced by land clearance and removal of natural vegetation from the plains during the urban sprawl to make room for agriculture and urbanization. These zones include extensive flat alluvial plains, covered by relatively similar vegetation, mostly small trees and dwarf shrubs. Tall, clump-forming desert grasses are common. Signs of extensive drought damages done by land clearing activities are apparent and hence the natural vegetation that has survived in these areas has adapted to harsh conditions.

### **3.2.2 Fauna**

Eastern Boundaries: No endangered fauna exist in this section, however, some avian fauna, sparrows of diversity genera, crows, cuckoos, and wild and domesticated pigeons exist. Street cats are more abundant species growing their population un-hindered and un-attendant at rural places. Limited farming for cows, goats and poultry exists. Among creeping fauna, snakes of few types also exist.

Southern Boundaries: The soil is sandy and rocky in appearance grown by wild Kekar trees and bushes having no valuable significance except cattle grazing for domesticated animals such as goats and cows. Some camels are also encountered grazing on elevated wild bushes and trees. Snakes of some variety are encountered. There is no characteristic avian fauna except Collard Dove and Wild pigeon is reported. No significant faunal regime exists in this region.

Northern and Western Boundaries: The High and closed seas of Karachi in the northern and western corridors are enriched with large variation of aquatic organisms in the form of large variety of fishes, shrimps, prawns, lobsters, crabs, turtles etc. Sea snakes are also encountered in closed sea sections. Among avian fauna Egret, Seagulls, and White Storks are most common species. Migratory faunal regimes are encountered in winter in closed sea sections or in isolated islands that mainly consisting of Flying Ducks, Pelicans and Flamingos.

The impoverished as well as degraded environment resulting from non-availability of surface as well as groundwater and discharge of untreated wastewater into Lyari and Malir Rivers has irreversibly reduced the biodiversity of the indigenous as well as introduced vegetation and hence it offers very little chance for the survival/growth of fauna in Karachi.

Water availability is the main constraint for the distribution of many animal species. Large wild mammals are virtually absent in the areas within Karachi. There are a number of characteristic bird species that have adapted to the agricultural environment in the outskirts and suburban areas. These include Indian Roller, Common Mynah, Pigeon, and House Sparrow.

### 3.3 Overview of Socioeconomic Condition

#### 3.3.1 Population

The increase in population is putting heavy pressures on the physical, infrastructural, financial and institutional systems of the city. A large segment of Karachi's population, roughly 40%, is afflicted with poverty. The living conditions of the deprived section and its economic wellbeing are major concerns.

Karachi is Pakistan's most diverse city in terms of ethnicity, linguistic identity, and religious affiliations. While most of the population belongs to Islamic sects, the city also houses a sizeable proportion of non-Muslim communities including Christians, Hindus, and Zoroastrians. Mohajirs form the largest ethno-linguistic and political group (almost 50%) followed by Pashtuns (25%).

Apart from in-migrants from Pakistan's provinces, a large number of migrants from Afghanistan, Bangladesh and other South Asian countries have settled in the city. With an average monthly household income of Rs. 15,000, there is considerable variation in income distribution.

#### 3.3.2 Health

The severe air, water and solid waste pollution in the city constitutes a serious health risk to a large proportion of residents. Large proportion of the city's population lives in katchi abadis or slums with very poor infrastructure and access to basic services.

It is estimated from the World Bank study 2015 that in Karachi health cost related to air pollution is in the range of Rs. 30-40 billion every year. It was reported that 23% of the patients admitted in Civil Hospital were infected by respiratory tract infection.<sup>25</sup> Table 9 presents estimated annual cases of morbidity from PM ambient concentrations in Karachi in 2009.

Table 6: Estimated Annual Cases of Morbidity [PM Ambient Concentration in Karachi-2009]

Activity	Number of Incidences
Chronic Bronchitis	145,185
Hospital Admissions	26,686
Emergency Room Visits	523,498
Restricted Activity Days	81,838,293
Lower Respiratory Illness in Children	1,353,000
Respiratory Symptoms	260,459,264

Source: The World Bank, "Sustainability and Poverty Alleviation: Confronting Environmental Threats in Sindh, Pakistan", 2015

#### 3.3.3 Education

The Pakistan Social & Living Standards Measurement Survey of 2014-15 showed a 76% literacy rate for the urban areas of Sindh. The literacy rate for Karachi is 82%. The overall literacy rate for urban areas in Pakistan was 76% (literacy for population above 10 year and older).

#### 3.3.4 Economy

<sup>25</sup> IUCN-Pakistan, "Sindh Strategy for Sustainable Development", 2007

Karachi is the financial capital of Pakistan and plays pivotal role in the nation's economic and industrial activities. Karachi Strategic Development Plan 2020 (KSDP-2020) describes that Karachi generates about 20% of the national output, creates more than 30% of value added in manufacturing, and accounts for 25% of national tax revenues. More importantly, the city provides jobs for a large population – 40% of national employment in large-scale manufacturing is based in Karachi. One of the Karachi's key comparative advantages is the low cost of labor. The low wage work force lives primarily in Katchi Abadis (squatter settlements) that run along water ways and on government owned land in pockets throughout the urbanized area. Many poor people work near where they live, which reduces commuting costs and helps keep wages low. Inflation in Karachi is the lowest among all of the large cities (population in excess of 500,000) in Pakistan with the exclusion of Faisalabad.

## 4.0 REGULATORY REVIEW

This chapter briefly describes the national, provincial and World Bank laws, policies, strategies, guidelines, codes and procedures for the categorization, screening, environmental assessment and environmental compliance of the proposed project/subprojects. This chapter stipulates that how the various requirements have been or will be complied with during the planning and implementation stages of the subprojects.

### 4.1 National Policies and Strategies, and Laws

This section briefly describes different laws, policies and strategies of the Government of Pakistan relevant for the proposed projects mentioned in the previous chapters.

#### 4.1.1 National Water Policy 2009

The objective of the National Water Policy is to take cognizance of the emerging water crisis and provide an overall policy framework and guidelines for a comprehensive plan of action. This policy is a national framework within which the provinces can develop their master plans for sustainable development and management of water resources.

Following objectives of National Water Policy, among others, address environmental concerns:

- Promoting sustainable consumption and production patterns throughout the water sector from exploitation to utilization.
- Augmentation of the available water resources of the country through judicious and equitable utilization via reservoirs, conservation and efficient use.
- Promoting behavioral change to reduce wastage of water by raising public awareness through media campaigns and incorporating water conservation lessons in syllabi/curricula at primary, secondary and tertiary levels.
- Treatment and possible reuse of waste water - domestic, agricultural and industrial.
- Promoting appropriate technologies for rain water harvesting in rural as well as urban areas.
- Regulating groundwater withdrawals for curbing over-abstraction and promoting aquifer recharge.
- Climate change impact assessment and adaptation for sustainable water resources development and management.

Following policy measures address environmental concerns:

#### Comprehensive Regulatory Framework

The Federal government must play a leading role in facilitating regulations to ensure the efficient and sustainable utilization of ground water, industrial uses, and waste water management. Food security, water security and energy security being inextricably linked, so the regulatory framework must address all the associated issues comprehensively, including ground water contamination, waste treatment, and open defecation (WASH).

#### Planning Principles

- Efficiency and conservation will be promoted at all levels.
- Environmental Sustainability must be ensured.

### Conservation of Water

The Water Conservation Plans shall include: Conservation of Water: re-use and recycling of municipal and industrial waste water effluent after appropriate treatment at source adoption of rainwater harvesting technology.

### Industry

The Water Policy accordingly classifies industry as an important user of water, and the provision of its water needs shall be facilitated. A study shall be undertaken for enactment of legislation to formally allow and define the use of water abstraction licenses and water rates for industrial use.

Industry shall be required to carry out in-house treatment of their wastewater before transfer to municipal sewer as per NEQ standards and the "Polluter Pays" principle shall be strictly enforced. Existing rules shall be strengthened for effective monitoring/control of pollution as per international standards. The standards of effluent disposal shall be strictly enforced.

### Demand Management

It is recognized that fresh water, being a finite resource, cannot fulfill unlimited demand of numerous users. Demand Management of various uses shall, therefore, be accorded high priority.

Demand Management Plans shall be prepared for all uses, specifying measurable targets, and shall be rigidly enforced.

Water use efficiency in all sectors shall be vigorously pursued, and towards this end all avenues like professional, administrative, legal, technologies transfer and research application coupled with appropriate economic and financial incentives shall be explored.

Under National Water Policy, National Water Council is proposed whose responsibility would be to implement the policy measures through different water related public sector organizations.

#### **4.1.2 Climate Change Policy of Pakistan 2012**

Climate Change Policy (CCP) establishes that urban areas in Pakistan are already affected by short-term climate changes. In the long term, it is predicted that urban areas located in the irrigated plains and coastal areas will be significantly affected by climate changes. It is predicted that due to climate changes, changes in hydrological cycle (intensive and erratic monsoon rains, flash floods, increased availability of water due to increased melting of glaciers in the short term, and decrease in water availability in the long term due to decrease in glacier flows) and increase in temperature will affect urban areas. 50 cyclonic storms developed in the northern Arabia Sea during 1946-2004. Four storms hit the coast of Karachi resulted in heavy downpours, flash-floods, and loss of life and property.

CCP predicts that due to climate change, extreme weather events such as heat and cold waves, heavy or too little precipitation, and strong winds will occur more frequently and will cause health impacts in urban areas, for example, diarrheal diseases because of insufficient

clean water availability for drinking and personal hygiene. It is predicted that vector-borne diseases such as malaria and dengue fever may increase. Similarly, extreme weather events will express themselves in the form of natural disasters such as floods, droughts, landslides, and urban flooding.

CCP recommends the following actions: develop city-specific strategic plans, prepare and enforce legislation for water resource management in industry and domestic sectors with special focus on groundwater, adopt water efficiency measures and technologies, adopt rain harvesting measures, avoid excessive groundwater pumping, reuse wastewater after treatment, take flood protection measures, assess the health vulnerabilities of communities and build their capacities, develop proper disaster management system, redesign and upgrade drainage capacity of cities, strengthen early warning systems, develop enabling mechanisms for the adoption of climate change adaptations and mitigation measures; and conduct awareness campaigns to underscore the importance of conservation and sustainable use of water resources. At present, most of these adaptations are not in practice in Karachi.

Regarding environmental management and climate change resilience of cities, CCP recommends that cities should update town planning design principles for lowering carbon footprints, ensure proper land use planning and encourage vertical instead of horizontal expansion, install wastewater treatment plants, segregate solid waste at source, develop municipal infrastructure in the periphery of urban areas, and conduct hazard mapping and zoning of areas before construction.

CCP recommends that Climate Change Units be established in all federal and provincial ministries, redesign administrative and procedures for federal and provincial environmental protection agencies (EPAs) and P&Ds to integrate climate change concerns into the EIA and ensure that these are strictly enforced particularly for infrastructure projects, and develop capacities of the relevant institutions to undertake appropriate mitigation actions to reduce GHG emissions.

Generally, the implementation of CCP is nominal due to limited interprovincial coordination; low capacity of the MCC, provincial departments, and city authorities; and low level of budgetary allocation for climate smart city development.

#### **4.1.3 Pakistan Climate Change Act 2016**

The Prime Minister established Pakistan Climate Change Council which coordinates and supervises the enforcement of the provisions of the Act, monitor implementation of the international agreements relating to climate change, approve and monitor implementation of comprehensive adaptation and mitigation policies, strategies, plans, programs, projects and other measures formulated by the authority to meet Pakistan's international obligations, monitor the implementation of National Adaptation Plan and its constituent provincial and local adaptation action plans, approve guidelines for the protection and conservation of renewable and non-renewable resources, species, habitats and biodiversity adversely affected or threatened by climate change.

The Minister In-charge of the Federal Government shall establish the Pakistan Climate Change Authority to exercise the powers and perform the functions under the Act. The functions of the authority shall be to formulate comprehensive adaptation and mitigation policies, plans, programs, projects and measures designed to address the effects of climate change, establish institutional and policy mechanism for implementation of Federal and provincial adaptation and mitigation policies, plans, programs, projects and measures, prepare suitable adaptation and mitigation projects for submission to international and local institutions for funding, including Clean Development Mechanism (CDM), Global Environmental Facility (GEF), Green Climate Fund and Adaptation Fund, prepare National

Adaptation Plan and its constituents provincial and local adaptation plans, carry out Technology Need Assessment and prepare Climate Change Technology Action Plan in accordance with international best practices, prepare projects for funding under the Reducing Emissions from Deforestation and Forest Degradation (REDD) Mechanism, prepare guidelines for the protection and conservation of renewable and non-renewable resources, species, habitats and biodiversity which are adversely affected or threatened by climate change, advise Government regarding appropriate legislative, policy and implementation measures and actions relating to disaster preparedness, capacity building, institutional strengthening and awareness raising in relevant sectors affected by climate change, advise the Government regarding implementation of international conventions, design, establish and maintain a national registry and database on greenhouse gas emissions etc.

Pakistan Climate Change Fund shall be established under the Act. The monies received in the form of donations, endowments, grants and gifts, and raised by the authority for the execution of programs and projects of the authority shall be paid into the fund. This fund shall be managed by the authority.

#### **4.1.4 The Canal and Drainage Act 1873**

The Canal and Drainage Act 1873 (CDA) focuses on construction and maintenance of drainage channels and defines powers to prohibit obstruction or order their removal. It also covers issues related to canal navigation. It briefly addresses issues relating to environmental pollution. Section 70(5) of the CDA clearly states that no one is allowed to “corrupt or foul the water of any canal so as to render it less fit for the purposes for which it is ordinarily used.” In addition, Section 73 of the CDA gives power to arrest without warrant or to be taken before the magistrate a person who has willfully damaged or obstructed the canal or “rendered it less useful.”

#### **4.1.5 Pakistan Penal Code**

The Penal Code discusses offences where public or private properties and/or human lives are affected due to intentional or accidental misconduct of an individual or body of people. The Code defines the penalties for violations concerning pollution of air, water bodies and land. In the context of this program, the Penal Code can provide a basis for the infrastructure projects to coordinate activities with the local authorities to ensure that construction and operation activities do not become a cause of public nuisance or inconvenience.

#### **4.1.6 The Antiquities Act, 1975**

This Act defines how to repeal and reenact the law relating to the preservation and protection of antiquities. The federal government may, by notification in the official Gazette, declare any antiquity to be a protected antiquity for the purposes of this Act.

### **4.2 Provincial Policies and Strategies, and Laws**

This section briefly describes different laws, policies and strategies of the Sindh province for the environmental compliance of proposed projects mentioned in the previous chapters.

#### **4.2.1 Sindh Strategy for Sustainable Development, 2007**

The Sindh Strategy for Sustainable Development (SSSD) proposed a ten year sustainable development agenda for Sindh. The main focus of SSSD is to promote the sustainable use of natural resources. It targets to reduce poverty and enhance social development through the participation of the people of Sindh.

Planning and Development Department Government of Sindh is responsible for the overall coordination of SSSD. The SSSD recommends that the rehabilitation and extension of water

supply and sanitation networks, effective water and wastewater quality monitoring and treatment to comply with SEQs, improved coordination among stakeholders (public agencies, private sector, and residents) for the effective management of air pollution, consultation based infrastructure planning and development with main focus on minimizing traffic and pollution hazards, and conducting environmental impact assessment of all the major projects. In addition, the SEPA should be strengthened for effective monitoring of pollution, especially in the case of industries.

SSSD recommends for the sustainable development and environmentally complying operations of industries: incentive mechanisms for reducing pollution; awareness raising of industrialists and stakeholders; promote cleaner production; enforce pollution charges as per SEPA 2014; prepare baseline of all industrial estates and sites to establish the pollution levels, waste disposal practices, air emissions, generation of hazardous waste for the preparation of environmental management plans for complying SEPA 2014; preparation of EIAs for all industrial development and infrastructure projects.

#### **4.2.2 Sindh Sanitation Policy 2017**

The vision of the policy is to provide the population of Sindh the better sanitation service and to make sure that the entire population of Sindh has access to a safely managed sanitation service and sanitary environment that is also nutrition sensitive and hygienic.

The key targets of the policy are to eradicate open defecation from Sindh province by 2025, while 70% villages of 13 high priority districts achieve the status of open defecation free by 2020, 100% households in Sindh have access to and use sanitary latrines by 2025, while 70% of rural households in high priority districts will achieve this by 2020, to strengthen and implement liquid waste with sewer lines and covered/improved drains with 85% coverage of urban areas and 60% coverage in rural areas, to create and develop wastewater treatment mechanisms to cover 75% of urban areas and 40% rural areas by 2025, to implement integrated solid waste management with 100% coverage in urban areas and 60% in rural areas by 2025.

The policy is built upon thirteen principles including i) alignment with the goals and targets of the Sindh Development Goals (SDGs) for sanitation, ii) adherence to the pursuit of total sanitation as outlined in Pakistan Approach to Total Sanitation (PATS), within the province, iii) safely managed sanitation services for all persons in Sindh province, iv) prioritize the areas that pose the greatest risk to human health namely hygiene awareness and excreta disposal, v) recognizing that inadequate and unsafe water supply and sanitation as major cause of diarrhea and nutritional deficiency in children, vi) increase access to high quality nutrition sensitive services, including access to water, sanitation facilities and hygiene, vii) integrating key hygiene actions (safe drinking water, hand washing with soap, safe disposal of excreta, and food hygiene) and essential components in all nutrition programs, viii) promoting community led approaches to strengthen the demand for safely managed improved sanitary conditions, ix) identification and marketing of affordable (in terms of designs as well as availability of water) and cost effective technical solutions, x) ensuring the sustainability of the services by mobilizing and engaging existing structures, xi) envision of component sharing model in the National Sanitation Policy, xii) the role of women as an integral component of behavioral change communication strategies and project planning, implementing and monitoring, xiii) establishing and maintaining an independent monitoring and evaluation system to track progress.

### **4.2.3 Sindh Drinking Water Policy 2017**

The vision of the policy is to provide safely managed drinking water whose supply is adequate, well maintained and sustainable and to enhance public awareness about health, nutrition and hygiene related to safe drinking water.

The main principles of the policy are aligned with the National Drinking Water Policy 2009 and sustainable development goals. These principles are mainly based upon access to safely managed drinking water to every citizen, water allocation for drinking purpose as the priority over other uses, removing the existing disparities in coverage of safe drinking water and addressing the needs of the poor on priority basis, recognizing the cause of diarrhea and nutritional deficiency in children due to inadequate and unsafe water supply and sanitation, increase the access to high quality nutrition sensitive services (including access to water, sanitation facilities and hygiene), integration of key hygiene actions (safe drinking water, hand washing with soap, safe disposal of excreta, food hygiene) as essential components in all nutrition programs, realizing the fact that access and availability of safe drinking water affects all aspects of life of a citizen, ensure women participation in planning, implementation, monitoring and operation and maintenance of water supply systems, delegation of responsibilities and resources to local authorities for the provision of safe water supply, development of supportive policy framework to encourage alternative options through stakeholders, promotion of execution of component sharing model for government programs and projects to ensure financial sustainability and development and use of low cost technologies in water and sanitation.

The overall goal of the policy is to improve the quality of life of people of Sindh by reducing morbidity and mortality caused by water borne diseases through provision of safely managed and potable drinking water to the entire population that is located on premises, available when needed, and free from contamination, affordable and of sufficient quantity, and in a way that is efficient, equitable and sustainable.

The specific objectives address mainly the introduction of legislative measures to create enabling environment, involvement of community in the water supply systems, development of district level drinking water availability plans, enhance the coverage of the safely managed drinking water in the province, development of criteria for installation of new drinking water supply schemes, standardized service delivery models for both urban, and rural drinking water supply schemes to improve efficiency and mechanisms for reuse, recycle and recharge of wastewater for other municipal and productive uses, ensuring the compliance of all the drinking water supply schemes and municipal discharges with the environmental quality standards, installation of water treatment plants at existing drinking water supply schemes, development of water safety plans for all drinking water supply systems, develop and sustain regular drinking water quality monitoring and surveillance and remedial action, increase public awareness about water related diseases, nutrition and hygiene, ensuring drinking water supply projects to be nutrition sensitive, institutionalize Water, Sanitation & Hygiene (WASH) in school and institute adaptation measures and disaster risk reduction and mitigation strategies to minimize the impact of climate events on drinking water supply systems.

### **4.2.4 Karachi Strategic Development Plan 2020**

The vision of Karachi Strategic Development Plan 2020 (KSDP) is to “transforming Karachi into a world class city and attractive economic center with a decent life for Karachiites”. The objectives of KSDP-2020 are: (a) design future growth of Karachi based on its strengths and potential; (b) sustainable growth by integrating various development activities under holistic vision; (c) identification of social, economic, environment, and urban infrastructure issues; (d) development of strategic framework for city development; and (e) establish collaborative institutional arrangement with the participation of stakeholders and citizens.

Implementation of the KSDP-2020 is provided a legal coverage under Section 40 of the Sindh Local Government Ordinance 2001 (SLGO). SLGO makes it mandatory for all the development agencies in Karachi to follow the plan for planned and coordinated development of Karachi. KSDP proposes the establishment of new industrial parks or zones. KSDP recognizes that higher level of air pollution persists in the city due to automobile and industrial emissions, open burning of solid waste, and other domestic and commercial emissions. Hazardous industrial waste is burned in substandard incinerators resulting hazardous emissions.

KSDP recommends renewal and maintenance of current buildup areas rather than spatial expansion. KSDP recognizes the economic importance of SITE, Korangi Industrial Estate, Bin Qasim Zone, Export Processing Zone-Surjani, SITE-II, and Textile City for Karachi and country. Infrastructure development, enhanced connectivity, and modernization of these industrial estates is essentially required for optimizing the productivity. KSDP also proposed new industrial zones, these are, Dhabeji along the National Highway, in Deh Gandpass near intersection of RCD Highway and Northern Bypass, in Deh Mahyo north of Surjani Town.

#### **4.2.5 The Karachi Water and Sewerage Board Act, 1996 (KWSB Act)**

Under KWSB Act 1996, board was established for supply of water and disposal of sewerage in the Karachi Division.

**Powers and Functions of the Board:** The Board shall i) sanction the fees and levy for water connections, water supply to tankers and sewerage connections and collect the charges, ii) reduce, suspend or disconnect the water supply and impose surcharges, if dues are not paid within the due time, iii) make regulations with the approval of the Government, iv) undertake construction improvement, maintenance and operation of water works and sewerage works, v) assess the position of water supply from time to time and regulate water supply, vi) review the existing schemes or prepare new schemes relating to water works and sewerage work and undertake execution with the approval of Government, vii) regulate, control or inspect water connection, sewer lines and service lines, viii) produce and supply of potable water, ix) place, maintain aqueducts, conduits, sewers etc.

**Supply of Water and Execution of Schemes:** The Board shall i) be responsible for the bulk production of potable water and its distribution, ii) ensure that the water supplied by it is duly filtered, treated and tested and is fit for human consumption, iii) arrange retail distribution of water within its jurisdiction excluding the areas receiving water supply through constituent Bodies, iv) supply water to any person or authority in the area or areas notified under this Act (subject to availability), v) continue to make bulk water supply to the constituent Bodies (Karachi Port Trust, Cantonment Board of Karachi, Sindh Industrial & Trading Estate, Karachi Pakistan Steel Mills Copr. Defense Service or any other body or organization notified by Government) at such rates and subject to such terms and conditions as may be determined by the Board, vi) continue to execute the Hub Dam Water Supply Stage I and Phase-IV of the Greater Karachi Bulk Water Supply Stage I and Sewerage Disposal Projects, vii) have right to place and maintain aqueducts, conduits and lines of mains, drains, sewers or pipes, over, under, along or across any immovable property without acquiring such property, and to enter on such property for the purpose of examining, repairing, altering or removing any aqueducts, conduits or lines of mains, sewers or pipes.

#### **4.2.6 Sindh Environmental Protection Act 2014 (SEPA 2014)**

SEPA 2014 is the overriding environmental legislation in the province of Sindh. SEPA 2014, Section 35 states that the provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any other law in force for the time being.

After the 18<sup>th</sup> Constitutional Amendment, environmental management has been delegated to the provincial governments. The environmental management of the province is mainly governed under the SEPA 2014, which is a replica of the Pakistan Environmental Protection Act of 1997 with some amendments. The law is comprehensive and provides the basic framework for environmental management of the province. The main focus of the law is on sustainable development, protection, conservation, rehabilitation, and improvement of environment. It instructs the provincial government to establish the Sindh Environmental Protection Council. Under the law, Environmental Impact Assessment/Initial Environmental Examination (EIA/IEE) is essentially required for all the projects before commencing any construction activity. It prohibits specified discharges and emissions. Sindh Environmental Quality Standards are an essential part of the law. The SEPA empowers the provincial government to issue notices and to enforce the Act for the protection of the environment.

SEPA 2014 is comprehensive with respect to its legal coverage for ensuring environmental compliance by all types of interventions in rural and urban areas and economic development sectors. Provisions of Section 11 establish that the law is universal and it is applied to all sources of pollution and threats to natural resources. The priority of SEPA is environmental compliance by industry, with more emphasis on industry located in urban setups. On the other hand, regulatory focus of SEPA on rehabilitation projects of water supply, sanitation, roads, and urban spaces, and small and medium enterprises (SMEs) is nominal.

SEPA 2014 has established the Sindh Environmental Quality Standards (SEQS). These are discharge standards and are applicable at the point of discharges of emissions. SEQS are relevant for wastewater treatment plants and landfills activities. SEPA 2014 states that noncompliance with SEQS and not paying pollution charges will invoke implementation of punitive sections of the Environmental Protection Order and penalties to every noncomplying person, corporate body, Government agency, local authority, or local councils. Cases challenged by the parties will be settled by the Environmental Magistrates and Tribunals, and if required, the cases can also be appealed in the higher courts. Standards for the following types of effluent and emissions are specified in the SEQS and may be relevant to the specified projects:

- a) Municipal and liquid industrial effluent parameters (32) for discharge to inland waters, sewage treatment facilities, and the sea
- b) Industrial gaseous emissions (16) into the atmosphere
- c) Motor and vehicle exhaust and noise (3 to 5)
- d) Ambient air quality (9)
- e) Drinking water quality (33)
- f) Noise standards for residential, commercial, industrial, and silence zones

SEPA 2014 instructs the proponents of projects to conduct and submit IEE or EIA study, according to the size and impacts of the subprojects of the Program. In the context of CLICK, IEEs will be required for new water supply and sanitation schemes. Section 17 of SEPA 2014 establishes that, “no proponent of a project shall commence construction or operation unless he has filed with the Agency an IEE or EIA, and has obtained from the Agency approval in respect thereof.” Under SEPA 2014, public participation through public hearing is essential part of IEE reports approval. Sindh Environmental Protection Agency (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations, 2014, stipulate the complete approval system for IEEs. CLICK will not finance any sub-project for which EIA will be required. Most of the sub-projects will be either small or rehabilitation

projects. SEPA 2014 does not demand environmental assessment of rehabilitation projects. IEE might be required for new small projects.

### **Sindh Environmental Protection Agency (Review of IEE and EIA Assessment) Regulations, 2014**

This document sets out the key procedural requirements for conducting an IEE and EIA. The document lists the responsibilities of proponents and duties of responsible authorities and provides schedules of proposals for determining whether the project requires IEE, EIA or screening under Schedules I, II, and III respectively and lays down the procedures for Environmental Approval and for filing the case with the SEPA to receive the NOC.

The Regulations also provide the necessary details on the preparation, submission, and review of IEEs and EIAs. The following is a brief step-by-step description of the approval process of an IEE:

1. To determine whether a sub-project is categorized as requiring an IEE based on the screening as per three schedules.
2. An IEE or screening is conducted according to the requirements outlined in the SEPA guidelines.
3. The fee (depending on the cost of the subproject and type of report) is submitted along with the IEE document.
4. IEE is also accompanied by an application in the format prescribed in Schedule V of the Regulations.
5. The SEPA conducts a preliminary review of the report and replies within 15 days of the submission. It either (i) confirms completeness; (ii) asks for additional information, if needed; or (iii) returns the report and asks for additional studies, if necessary.
6. The Agency shall make every effort to carry out its review of the environmental checklist within thirty days, and IEE within sixty days of issue of confirmation of completeness under regulation 9.
7. The SEPA accords its approval, subject to certain conditions:
  - a. Before commencing construction of the subproject, the proponent is required to submit an undertaking accepting the conditions.
  - b. Before commencing operation of the subproject, the proponent is required to obtain from the EPA a written confirmation of compliance with the approval conditions and requirements of IEE.
8. An EMP is to be submitted with a request for obtaining confirmation of compliance.
9. The EPA is required to issue confirmation of compliance within 20 days of receipt of the request and complete documentation.
10. IEE approval is valid for three years from the date of operational phase NOC.
11. After completion of construction, a monitoring report is to be submitted to the SEPA, followed by annual monitoring reports, during operations.

In the case of wastewater discharges in the canal system and use of wastewater for irrigation purposes, Section 11 of SEPA 2014 establishes that “no person shall discharge or emit or allow the discharge or emission of any effluent or waste in excess of SEQS” and “if the water is conforming SEQS, it can be used for irrigation purposes, otherwise not.”

#### **4.2.7 The Sindh Local Government Act 2013**

Under the Sindh Local Government Act 2013 (SLGA), Chapter VI, land use planning; implementation of building by-laws; management of environmental and health hazards; food adulteration; provision and maintenance of water supply schemes and public sources of

drinking water; and mobilization of communities for the upgrade of local infrastructure (transportation, landscaping, and removal of encroachments) are the responsibilities of municipal corporations/committees.

Under Chapter VI, the district council is responsible for the overall welfare of the population (health and safety); improvement and maintenance of district main transportation routes including removal of encroachments and other local infrastructure (such as open spaces, graveyards, public open spaces); assistance to relevant authorities in the provision of relief services in the case of natural calamities (fire, flood, hailstorm, earthquake, and epidemic); control over land use and spatial planning (including agriculture, industry, commerce, residential, and so on); and enforcement of municipal laws.

Under the second and fourth Schedules, both municipal committees and union councils are responsible for the management of dangerous and offensive articles and their trade.

Under the Sixth Schedule Part-I and Part-II of the Act, it is an offence and the Local Government (LG) can take the offender to court for discharging of chemicals in any drain, public watercourse, and public land that is likely to cause public health hazards; industry and commercial concerns disposing affluent in the water supply and sewerage system; adulteration of eatables and drinkables items; cultivation of agriculture produce or crop by irrigating with sewer water or any such liquid; and dumping of solid waste and refuse in a place other than a landfill or dumping site, establishing a brick kiln, lime kiln, charcoal kiln, or pottery within such distance of the residential area as may be specified by the Council, dyeing or tanning skins within such distance of any commercial or residential areas as may be specified by the local government, and damaging or polluting physical environment, inside or outside private or public premises, in a manner to endanger public health.

#### **4.2.8 The Sindh Wildlife Protection Ordinance, 1972**

The ordinance requires the protection of wildlife species declared as protected and game animals. This ordinance restricts hunting of protected and game animals. Game animals can be hunted under permit from the wildlife department. Hunting is also prohibited by means of certain lethal weapons, mentioned in the ordinance. The import and export of wildlife, trophies and meat is also prohibited. Ordinance declares certain areas as national parks and game reserves where hunting and spoiling of its natural landscape and environment is prohibited.

### **4.3 World Bank Safeguard Policies**

The proposed projects trigger the following World Bank safeguard policies:

- Environmental assessment OP 4.01
- Physical Cultural Resources OP 4.11
- Involuntary Resettlement OP/BP 4.12

#### **4.3.1 Environmental Assessment OP 4.01**

This policy requires environmental assessment (EA) of projects proposed for World Bank financing to help ensure that these are environmentally sound and sustainable, and thus to improve decision making. The EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.

The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible.

The EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (including physical cultural resources) and trans-boundary and global environmental aspects. EA considers natural and social aspects in an integrated way. It also takes into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements. The EA is initiated as early as possible in project processing and is integrated closely with the economic, financial, institutional, social, and technical analyses of a proposed project.

As per the policy, the Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of the environmental assessment. The Bank classifies the proposed projects into one of four categories of A, B, C and FI depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Consistent with the requirements of OP4.01, the proposed CLICK project has been assigned an EA category A due to potential social risks to the project related to ongoing anti encroachment drive being carried out in Karachi by the GoS.

#### **4.3.2 Physical Cultural Resources OP 4.11**

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.

Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements.

The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment process.

#### **4.3.3 Involuntary Resettlement OP/BP 4.12**

The requirements for OP4.12 are covered under Social Management Framework prepared for the project.

## 5.0 POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

This chapter describes potential generic environmental risks and impacts (direct, indirect/induced and cumulative) to be caused by the sub project's construction and operation phases on surrounding environment and communities. It also describes mitigation measures as per mitigation hierarchy (avoidance, minimization or reduction, mitigation, compensate/offset). Sub-projects that would have major widespread and intense environmental impacts will be excluded from the project and will not be eligible for financing. Therefore, the proposed CLICK project will finance sub-projects and activities in Component 1 that may still have significant impacts but will not be wide spread, and therefore, can either be avoided through re-location of activities or in their design, or otherwise reduced to acceptable levels or reversed through the application of effective mitigation measures. These impacts are expected to arise during the construction activities, and a lesser extent during operations and maintenance phases.

### 5.1 Project Activities

Table 10 describes type of project and associated activities which could result into potential environmental risks and impacts. *Only component-1 of the CLICK has the potential of construction and operation phase environmental impacts.*

Table 7: Project Activities

#	Project	Activities
1	Urban & Storm Water Drainage i) Repair & rehabilitation of drains and flood control system under LCs ii) Covering of exposed street level drainage and sewage channels	<ul style="list-style-type: none"> <li>i) Clearing of the area (cutting of trees, bushes, crops etc.)</li> <li>ii) Marking of drain alignment</li> <li>iii) Digging/excavation</li> <li>iv) Concrete blinding at the base</li> <li>v) Reinforcement (iron rods) positioning</li> <li>vi) Laying of concrete base on the blinded surface and positioned reinforcement</li> <li>vii) Positioning side drain wall panels</li> <li>viii) Casting of concrete in the panels</li> <li>ix) Removal of panels after casting, setting and curing of concrete</li> <li>x) Backfilling and compaction</li> </ul> <p><i>In case of underground pipelines, the steps could also be a) bedding, b) laying of pipelines, c) joining/welding, d) backfilling</i></p> <p><b>In Case of Culverts</b> (Steps i to iv remain the same)</p> <ul style="list-style-type: none"> <li>v) Laying precast pipe culvert/rings into the alignment on concrete base</li> <li>vi) Arranging the form work panel and casting of concrete</li> <li>viii) Removal of panels after concrete is cured</li> <li>ix) Placing head wall panels and casting</li> <li>x) Backfilling and compaction</li> </ul>
2	Connectivity & Urban Road Network i) Repair and rehabilitation of roads, streets, signalized intersections etc. under LCs ii) Pedestrian sidewalks & walkways, bicycle paths, pedestrian bridges and crossings iii) Street lighting, security lighting, and road signage	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>i) Clearing of the area (cutting of tress, bushes, crops etc.)</li> <li>ii) Excavation</li> <li>iii) Leveling/grading</li> <li>iv) Construction of culverts/drains (if required)</li> <li>v) Fine grading (leveling the surface)</li> </ul>

		vi) Laying of aggregate base course (crushed stones) and compaction vii) Asphalt paving <b>Walkways and Bicycle Paths</b> i) Demolishing existing structures ii) Leveling/grading iii) Flooring <b>Pedestrian Bridges</b> i) Clearing ii) Foundation iii) Installing railings and stairs iv) Installing canopy etc.
3	<b>Public Spaces</b> i) Parks, playgrounds, greenery, recreation facilities, public spaces, street furniture, landscaping, tree plantation	i) Soil preparation (excavation, filling, leveling) ii) Addition of soil amendments iii) Installation of raised beds, sheds and signs iv) Installation of irrigation system v) Marking of plots and installation of pathways vi) Fencing vii) Plantation
4	<b>Health and Education Infrastructure</b> i) Rehabilitation of existing primary health care facilities and schools buildings operated by DMCs	Minor construction and renovation activities
5	<b>Sanitation</b> i) Public toilets, especially for women	Construction activities for toilets
6	<b>Fire and Disaster Management</b> i) Rehabilitation of fire control stations and facilities	i) Minor construction/renovation activities ii) Water supply arrangements iii) Installation/construction of water storage tanks iv) Installation of water pumping arrangement for fire engines

## 5.2 Potential Environmental Impacts

Table-11 presents environmental aspects and potential impacts of the project activities. Mainly the construction phase will generate environmental impacts.

Table 8: Environmental Aspects and Potential Impacts

#	Project	Activities	Environmental Aspects	Potential Environmental Impacts
1	<p>Urban &amp; Storm Water Drainage</p> <p>i) Repair &amp; rehabilitation of drains and flood control system under LCs</p>	<p>i) Clearing of the area (cutting of trees, bushes, crops etc.)</p> <p>ii) Marking of drain alignment</p> <p>iii) Digging/excavation</p> <p>iv) Concrete blinding at the base</p> <p>v) Reinforcement (iron rods) positioning</p> <p>vi) Laying of concrete base on the blinded surface and positioned reinforcement</p> <p>vii) Positioning side drain wall panels</p> <p>viii) Casting of concrete in the panels</p> <p>ix) Removal of panels after casting, setting and curing of concrete</p> <p>x) Backfilling and compaction</p> <p><i>In case of underground pipelines, the steps could also be a) bedding, b) bury the pipelines, c) joining/welding, d) backfilling</i></p> <p><b><i>In Case of Culverts</i></b> (Steps i to iv remain the same)</p> <p>v) Laying precast pipe culvert/rings into the alignment on concrete base</p> <p>vi) Arranging the form work panel and casting of concrete</p> <p>viii) Removal of panels after concrete is cured</p> <p>ix) Placing head wall panels and casting</p> <p>x) Backfilling and compaction</p>	<p><b>Construction Phase</b></p> <p><u>Vegetation</u> loss of trees, plants, crops etc. due to clearing of land for camp sites, laying pipelines and building infrastructure</p> <p><u>Natural Habitats</u> Disturbing natural habitats (terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the nonliving environment.)</p> <p><u>Physical Cultural Resources (PCRs)</u> Presence of PCRs at the project sites</p> <p><u>Air Quality</u></p> <p>i) Fugitive emission of dust (SPM, PM<sub>10</sub>, PM<sub>2.5</sub>) from excavation and vehicular movement</p> <p>ii) Stack emissions from generators</p> <p>iii) Vehicular emission</p> <p><u>Wastewater</u></p> <p>i) Generation of sanitary wastewater from construction camps</p> <p><u>Solid Waste</u></p> <p>i) Generation of domestic solid waste from construction camps</p> <p>ii) Generation of empty chemical, paint, lubrication/grease, and fuel containers</p> <p>iii) dismantled pipelines</p> <p>iv) Generation of excavation material, debris etc.</p> <p><u>Soil</u></p> <p>i) Spillage and leakage of chemicals, fuel, lubricant on soil</p> <p>ii) storage of oily parts and rags on unpaved floors</p> <p><u>Noise</u></p>	<p><b>Construction Phase</b></p> <p><u>Vegetation</u> Air pollution, soil erosion and contamination, disturbance to the aesthetic of the area</p> <p><u>Natural Habitats</u> Disturbance to natural habitats and biodiversity</p> <p><u>Physical Cultural Resources (PCRs)</u> Disturbance to PCRs if located at the project sites</p> <p><u>Air</u> Air pollution resulting in poor visibility, disturbance to vegetation and property, health implications on workers and nearby community</p> <p><u>Wastewater</u> soil and water contamination, odor, health implications (due to breeding of mosquitos and flies), and nuisance due to improper treatment and disposal of sanitary wastewater from construction camps</p> <p><u>Solid Waste</u></p> <p>i) nuisance, health implications on workers and community (due to breeding of mosquitos and flies) (if not disposed/treated properly)</p> <p>ii) Soil contamination due to improper disposal of hazardous solid waste</p> <p><u>Soil</u> Soil contamination</p> <p><u>Noise</u> Nuisance, health implications on workers and nearby community, loss of biodiversity</p> <p><u>Safety</u></p>

#	Project	Activities	Environmental Aspects	Potential Environmental Impacts
			<p>Noise from construction machinery, generators, construction activities and vehicular movement</p> <p><b>Safety</b></p> <p>i) Safety concerns of workers ii) Safety concerns for the nearby community/passersby</p> <p><b>Operation Phase</b></p> <p>i) leakages in the drains ii) damaging of drains iii) Overflowing water due to clogging of drains</p>	<p>Safety issues for workers and community</p> <p><u>Traffic Congestion and access restrictions at or around construction sites to construction activities</u></p> <p><b>Operation Phase</b></p> <p>i) soil and water contamination due to leakages in the drains ii) odor and outbreak of diseases due to leakages, damaging and overflowing of drains</p>
2	<p>Connectivity &amp; Urban Road Network</p> <p>i) Repair and rehabilitation of roads, streets, signalized intersections etc. under LCs</p> <p>ii) Pedestrian sidewalks &amp; walkways, bicycle paths, pedestrian bridges and crossings</p> <p>ii) Street lighting, security lighting, and road signage</p>	<p><b>Roads</b></p> <p>i) Clearing of the area (cutting of tress, bushes, crops etc.) ii) Excavation iii) Leveling/grading iv) Construction of culverts/drains (if required) v) Fine grading (leveling the surface) vi) Laying of aggregate base course (crushed stones) and compaction vii) Asphalt paving</p> <p><b>Walkways and Bicycle Paths</b></p> <p>i) Demolishing existing structures ii) Leveling/grading iii) Flooring</p> <p><b>Pedestrian Bridges</b></p> <p>i) Clearing ii) Foundation iii) Installing railings and stairs Installing canopy etc.</p>	<p><b>Construction Phase</b></p> <p>As above including i) temporary emission of asphalt fumes from asphalt plant and spraying of asphalt on roads ii) damaging of underground utilities lines of telephone, water, electricity, gas etc.</p> <p><b>Operational Phase</b></p> <p><b>Lighting</b></p> <p>Installation of energy inefficient lighting fixtures</p>	<p><b>Construction Phase</b></p> <p>As above including health implications in workers due to inhalation of asphalt fumes and inconvenience to the public due to damaging of underground utilities lines.</p> <p><b>Operational Phase</b></p> <p>Energy wastage</p>
3	<p>Public Spaces</p> <p>i) Parks, playgrounds, greenery, recreation facilities, public spaces, street furniture, landscaping, tree plantation</p>	<p>i) Soil preparation (excavation, filling, leveling) ii) Addition of soil amendments iii) Installation of raised beds, sheds and signs iv) Installation of irrigation system v) Marking of plots and installation of pathways vi) Fencing vii) Plantation</p>	<p><b>Construction Phase</b></p> <p>Minor construction related aspects as discussed above.</p> <p><b>Operational Phase</b></p> <p>Installation of energy inefficient lighting fixtures at parks/streets</p>	<p><b>Construction Phase</b></p> <p>Minor construction related impacts as discussed above</p> <p><b>Operational Phase</b></p> <p>Energy wastage</p>

#	Project	Activities	Environmental Aspects	Potential Environmental Impacts
4	Health and Education Infrastructure i) Rehabilitation of existing primary health care facilities and schools buildings operated by DMCs	Minor construction and renovation activities	<b>Construction Phase</b> i) Noise due to construction activities and machines ii) Spillage of oil, paints etc. on soil iii) health and safety issues for workers iv) dust emission ii) Solid waste generation (hazardous and nonhazardous)	<b>Construction Phase</b> i) Nuisance to community, health impacts due to noise ii) Soil pollution iii) Health and safety hazards for workers iv) Nuisance, soil and water pollution due to improper disposal of solid waste
5	Sanitation Public toilets, especially for women	Construction activities for toilets	As above (Construction Phase)	Construction related impacts as mentioned above
6	Fire and Disaster Management Rehabilitation of fire control stations and facilities	i) Minor construction/renovation activities ii) Water supply arrangements iii) Installation/construction of water storage tanks iv) Installation of water pumping arrangement for fire engines	As above (Construction Phase)	Construction related impacts as mentioned above

## **5.3 Mitigation Measures**

Following section describes details of the mitigation measures for the above identified potential environmental impacts in Table-5 for the construction and operation phases of the project activities.

### **5.3.1 Construction Phase Mitigation Measures**

Following are the construction phase mitigation measures for all the project activities.

- a) Campsite management
- b) Avoidance of clearing vegetation and restoration of the site by planting trees/crops
- c) Protection of natural habitats
- d) Protection of Physical Cultural Resources (PCRs)
- e) Suppression of dust emission
- f) Control of stack and vehicular emissions
- g) Control of asphalt fumes exposure
- h) Safe disposal of sanitary wastewater
- i) Safe disposal of domestic solid waste
- j) Safe disposal of hazardous and construction waste
- k) Soil pollution control
- l) Noise abatement
- m) Protection of Underground Utilities Lines
- n) Protection of workers from health and safety hazards
- o) Protection of community from accidents
- p) Traffic management
- q) Restoration of campsites
- r) Installation of energy efficient lighting

The main responsibilities for implementing mitigation measures during the construction phase rest with the contractors appointed to carry out the projects related to storm water drains repair and rehabilitation, urban roads, streets and intersections repair and rehabilitation, construction of pedestrian sidewalks and walkways, bicycle paths, pedestrian bridges and crossings, construction of toilets, rehabilitation of fire stations, and rehabilitation of existing primary health facilities and schools. The LCs will be responsible for monitoring the implementation of mitigation measures by the contractors for projects falling under their jurisdiction. LCs will implement their own system of internal checks to ensure that these actions are carried out to a satisfactory standard. In exceptional circumstances, if the contractors refuse to adhere to the requirements of the mitigation plan contained in the contract documents, then the LCs will use their authority to call a halt to a particular construction activity.

To avoid any misunderstandings regarding who is responsible for any particular mitigation activities recommended for the construction phase, the Construction Phase Environmental and Social Management Plan (ESMP) will be appended to the tender documents. This will ensure that contractors include in their bids the cost of any mitigation actions and also a reliable mechanism for enforcement. In fact, most of the recommended actions involve little or no capital investment, but they also depend on whether the contractor's management adopts a responsible attitude toward environmental protection, thereby ensuring that the construction activity is properly planned and that mitigation measures are properly implemented. The recommended mitigation actions for the construction phase are given under:

#### **a) Campsite Management**

The location and development of the Contractor's facilities (this applies to all types of facilities, storage areas, workshops, and labor camps) will be approved by LCs. Locations will be selected so that it does not interfere with the environment and social well-being of the surrounding communities in respect to noise, dust, vibration and other physical impacts. The construction labor camps shall be located at least 500 m away from the nearest habitation. The size of contractor's facilities are limited to absolute minimum to reduce unnecessary clearing of vegetation.

**b) Avoidance of Clearing Vegetation and Restoration of the Site by Planting Trees/Crops**

Where grading or excavation occurs within farmland, topsoil will be separated and stockpiled during the construction period. The topsoil stockpile will be secured with plastic. Following construction, the topsoil will be applied evenly to the site during the restoration process. The topsoil will be properly compacted and stabilized to prevent erosion and sediment transport.

During the design stage of the project and finalizing the project location and alignment for the drains and roads, it would be the priority to avoid those areas where there are chances of cutting of significant number of trees and clearing of vegetation/crops. In case if it is not possible to avoid, then the project site would be restored to its original as much as possible by planting trees, vegetation and crops at the cleared land. All works will be carried out in a fashion that ensures minimum damage or disruption to the flora. The contractor will be responsible for the restoration of the site and LCs to ensure restoration as per the requirements.

**c) Protection of Natural habitats**

During site selection and finalization of drains and roads alignment, the protection of the natural habitats will be the high priority area. The natural habitats are defined as a terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the nonliving environment. Alternatives will be considered for site selection and drains and roads alignments, in case of presence of natural habitats at the project areas to protect them at best.

During environmental assessment, surveys will be conducted for rare plants and priority or endemic wildlife species prior to civil work activities at all the sites. If any rare plants or sensitive wildlife species occur at the construction sites, the sensitive resource will be fenced, and no activities will be allowed within 15 meters (50 feet) of the resource.

Prior to construction activities during the nesting season, a biologist will survey potentially suitable nesting habitat for priority species birds. If active nests are identified, a qualified biologist will monitor the nesting birds' responses to the loudest level of construction noise for an appropriate duration. If the nesting birds show signs of disturbance that could result in nest failure, all work activities that disturb the birds will be temporarily halted and visual and acoustic barriers will be erected between the nesting location and work areas. Installation of any visual and acoustic barriers will be overseen and approved by the qualified biologist.

**d) Protection of Physical Cultural Resources (PCRs)**

All necessary and adequate care will be taken to minimize impact on cultural properties which includes cultural sites and remains, places of worship including mosques, churches, etc., graveyards, monuments and any other important structures as identified during design and all properties / sites / remains notified. No work will spill over to these properties, premises and precincts. The design options for cultural property relocation and enhancement will be prepared. All conservation and protection measures will be taken up as per design.

During earth excavation, if any property is unearthed and seems to be culturally significant or likely to have archaeological significance, the same will be intimated to the KMC/DMCs. Work will be suspended until further orders from the KMC/DMCs. The Archaeological Department will be intimated of the chance find and the KMC/DMCs will carry out a joint inspection with the department. Actions as appropriate shall be intimated to the Contractor along with the probable date for resuming the work. The contractor workers will be sensitized and fully informed about the importance of PCRs before the commencement of the work as their negligence during excavation and construction activities could damage these resources. All fossils, coins, articles of value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government, and will be dealt with as per provisions of the relevant legislation.

**e) Suppression of Dust Emission**

Regular water sprinkling will be the responsibility of the contractor at the dust generation points, during construction activities. The water will be also sprinkled at vehicular and machinery movement routes to avoid dust spreading to the nearby community. In addition, the provision of dust masks and ensuring their use by the workers will also be the responsibility of the contractor under Construction Phase ESMP.

**f) Control of Stack and Vehicular Emissions**

The stack emissions from generators, if used as standby source of power supply and vehicular/machinery movement at the site can affect the ambient air quality at project site. It will be the responsibility of the contractor to use well maintained generators and vehicles/machines to keep ambient air quality within the desired level. The contractor will be obliged to provide fitness certificate/maintenance records of the generators, vehicles and machines before deploying them at the construction sites.

**g) Control of Asphalt Fumes Exposure**

Asphalt fumes cause health implications in the workers working at road construction activities. Major sources of asphalt fumes are asphalt plant and spraying of asphalt on the roads. The workers would use appropriate respiratory protection devices to avoid inhalation of the fumes. The workers, handling the asphalt, would also use safety gloves, apron and shoes to prevent dermal exposure to the workers. The application temperature of the heated asphalt should be kept as low as possible to avoid generation of fumes. The engineering controls and good work practices would be used at all work sites to minimize worker exposure to asphalt fumes.

**h) Safe Disposal of Sanitary Wastewater**

Generally proper disposal of sanitary wastewater is not practiced during construction at construction camps. It will be the responsibility of the contractor to dispose sanitary wastewater in a nearby drain after passing it through septic tanks. The contractor can also plan to include temporary septic tanks for the construction team.

**i) Safe Disposal of Domestic Solid Waste**

Improper disposal of domestic solid waste from construction camps leads to air, water and soil pollution in case if it is burnt, thrown in the surface water drains or on open land. The solid waste dumping site becomes breeding place for mosquitos and flies which could be the source of outbreak of diseases. The construction contractors will implement a Waste Management Plan (mentioned in ESMP). At a minimum, the plan will address the sources of waste; waste minimization, reuse, and recycling opportunities; and waste collection, storage, and disposal procedures. The Waste Management Plan should distinguish between solid and liquid waste, as applicable, and include procedures for addressing waste

that may be hazardous to health and the environment. In addition, the Waste Management Plan will address the following:

- All food waste will be contained in covered bins and disposed of on a frequent basis to avoid attracting wildlife.
- Trash bins will be accessible at all locations where waste is generated.
- The project area will be kept clean and free of litter and no litter shall be allowed to disperse to the surrounding area.
- Solid waste will be removed from the site and transported to a municipal landfill or disposal site.
- Waste will not be dumped or buried in unauthorized areas or burned.
- Human waste associated with the worker camp and latrines will be properly contained and disposed.

The construction contractors will ensure all workers receive training on proper disposal of all waste prior to working on the project site.

**j) Safe Disposal of Hazardous and Construction Waste**

During construction activities different types of hazardous solid waste including empty containers of paint, lubricants, grease, fuel etc. oil filters, oily rags and construction waste are generated. The hazardous waste will be properly collected and stored at impervious surface under shade. This waste will be handed over to the authorized waste collectors so that these could be disposed of properly. The construction contractors will implement the Hazardous Solid Waste Management Plan (mentioned in ESMP). The Hazardous Solid Waste Management sill identify proper management procedures for all hazardous materials and wastes that may be encountered during construction, including handling, labeling, transporting, and storing procedures. In addition, the plan will address the following:

- Non-toxic and biodegradable produces will be used whenever possible.
- Hazardous materials will be transported and stored in appropriate containers with clearly visible labels. Hazardous materials will be stored at least 100 feet from any down gradient drainage or within secondary containment capable of containing its entire volume.
- Storm water flows will be directed away from hazardous material storage areas.
- Equipment and work areas will be regularly inspected for signs of leaks and spills. Spill containment and cleanup kits will be available wherever hazardous materials are being used or stored. Any incidental spills or leaks will be contained and cleaned up as soon as it is safe to do so. Any contaminated soil will be collected and disposed of in an appropriate land fill.
- Equipment refueling and maintenance will be limited to designated areas at least 30 meters (100 feet) from any down gradient drainage.

All workers will receive training on proper handling and storage of hazardous materials, as well as spill response and cleanup procedures, prior to working on the project site.

The debris produced during construction would preferably be dumped at nearby depressions rather than being thrown away and left unattended. Leftover material would not be dumped into storm water drains or watercourses, because such practices can clog these man-made and natural drainage systems and cause many other problems for the residents.

**k) Soil Pollution Control**

Soil pollution will be controlled by taking following measures:

- Storage of fuel, paint, and oil containers, oil filters, oily parts and oily rags on impervious floor under shade or storing of fuel and lubricants on a sand flooring of at least 6 inch thick, done on brick edge flooring lined with polyethylene sheet
- Placement of fuel containers under containment and proper decantation arrangement to avoid its spillage and leakage on floor
- Presence of spill kit to remove spills from the floor
- Avoidance of washing the contaminated floors rather dry cleaning the spills from the floor with saw dust and rags
- Location of fuel storage and refilling areas at least 500 m from all cross drainage structures and important water bodies

#### **l) Noise Abatement**

To minimize noise impacts on workers and nearby communities, the following measures will be taken:

- Carrying out regular inspection and maintenance of the construction vehicles and equipment
- Replacement of worn and noise producing parts of construction machinery in a timely manner
- In case of severe noise, using sound barriers to avoid the dispersion of sound waves into the nearby community
- Workers will use noise protection equipment when working in a noisy area
- The noise level of 85 dBA for 8 hour working for the workers is considered safe. The contractors would ensure keeping noise levels within safe limits. In case of higher noise levels (more than 85 dBA), the workers will be rotated. The workers at higher noise level areas will not be allowed to work for more than two to three hours and shifted to calm places for rest of the hours
- Vehicular and machineries will not be allowed to operate at project site at night
- Noisy machines and vehicles will not be allowed to be used at the project site (noise level will not be more than 85 dBA at 7.5 m distance)

#### **m) Protection of Underground Utilities Lines**

There are chances that the excavation and road side construction activities could damage the underground utilities lines of telephone, water, gas, electricity etc. The contractor will consult different utility companies to identify if their lines are present in the road construction sites. In case if these are present, the excavation will be done carefully to avoid damaging these. In case of any damage, the respective department will immediately be informed and called. The repair of the utility lines will be the utmost priority of the contractor.

#### **n) Health and Safety of Workers**

The contractor will comply with all the precautions as required for the safety of the workmen as per the national and World Bank requirements. Contractor will ensure that all operators of heavy or dangerous machinery are properly trained/certified, and also insured. The contractor will supply all necessary safety appliances such as safety goggles, helmets, masks, safety shoes etc., to the workers and staff. The contractor will comply with all regulation regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. Medical facilities will be provided to the labor at the construction camp. Suitable transport will be provided to take injured or ill person(s) to the nearest approachable hospital. First Aid Box will be provided at every construction campsite and under the charge of a responsible person who will always be readily available during working hours. The contractor will be responsible for providing safe drinking water and for implementing appropriate sanitation conditions, and for supplying hygienic food and a sewerage system for the construction team at the site.

The risk of fires will be evaluated for each project site based on the activities that would occur, environmental conditions, and presence of ignitable or combustible materials in the area. If the activities pose a risk of igniting a wildfire, appropriate fire prevention and response equipment will be available at each active site such as shovels, axes, fire extinguishers, and dedicated water tanks. All workers will be trained on proper fire prevention and response procedures prior to working on the site. Any smoking on site will be restricted to barren areas away from ignitable or combustible material. Smoking waste will be fully extinguished and disposed of appropriately.

**o) Protection of Community from Accidents**

The construction activities, particularly the excavation, will not be carried out during rainy season to avoid any accident. The excavated areas will be properly cordoned off, and warning and safety signs will be posted at accident prone areas to warn the passersby the potential danger at the construction site. The traffic will be diverted well before the construction area as per the traffic management plan. The construction contractors will install temporary signs and fences around all unsafe areas to prevent members of the public from entering the areas. If installing fences is not feasible, the area will be clearly identified as unsafe with signs and flagging.

**p) Traffic Management**

At all times, the contractor will provide safe and convenient passage for vehicles, pedestrians and livestock. The contractor will comply the Traffic Management Plans (TMP) as provided in ESMP. The traffic control plans will contain details of temporary diversions at different locations. Temporary diversion for road traffic will be constructed with the approval of the KMC/DMCs.

Special consideration will be given in the preparation of the traffic control plan to the safety of pedestrians and workers at night. The temporary traffic detours in settlement areas will be kept free of dust by frequent application of water. The contractor will take all necessary measures for the safety of traffic during construction work and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required for the information and protection of traffic approaching or passing through the construction site. All signs, barricades, pavement markings will be as per road specification.

Informational signs will be posted where lane and road closures could substantially disrupt traffic circulation at least 7 days prior to the closure. Proper traffic controls will be in place during closures to minimize impacts on traffic circulation and for traffic safety. Appropriate safety precautions will be taken when transporting large equipment on public roadways.

**q) Restoration of Campsites**

After the completion of construction activities at each site, all construction camp facilities will be dismantled and removed from the site. The site will be restored to a condition in no way inferior to the condition prior to commencement of the works. Various activities to be carried out for site rehabilitation include:

- Oil and fuel contaminated soil will be removed and transported and buried in waste disposal areas.
- Soak pits, septic tanks will be covered and effectively sealed off.
- Debris (rejected material) will be disposed of suitably.
- Underground water tank in a barren/non-agricultural land will be covered. However, in an agricultural land, the tank will be removed.
- If the construction camp site is on an agricultural land, top soil will be preserved and good earth will be spread back for a minimum 30 cm for faster rejuvenation of the land.

- In cases, where the construction camps site is located on a private land holding, the contractor will still have to restore the campsite as per this specification. The rehabilitation is mandatory and will be included in the agreement with the landowner by the contractor. Also, the contractor would have to obtain a certificate for satisfaction from the landowner.

**r) Installation of Energy Efficient Lighting**

During design and construction stages, it will be the priority to install energy efficient lights (LED Lights) or solar lights (where possible) at all the buildings, streets, roads and parks to conserve energy.

### **5.3.2 Operational Phase Mitigation Measures**

Following are the operational phase mitigation measures for all the project activities.

- a) Maintenance of storm water drains
- b) Maintenance of Roads, Pedestrian Walkways and Bicycle Paths
- c) Landscaping to improve aesthetic of the sites

**a) Maintenance of Storm Water Drains**

Lack of maintenance of storm water drainage system may cause certain environmental impacts such as contamination of soil and water resources, outbreak of diseases, odor and nuisance at areas where drain water spills over and remains stagnant for longer periods. Clogged drains will also create flood situation in the city during rainy season.

KMC/DMCs staff will look after the proper functioning of the drainage system throughout the project lifecycle. For such system, KMC/DMCs shall equip themselves with proper trained workforce and requisite machinery with the support of vigilant governance system. Regular maintenance and upkeep of these drains will be under strict operation and maintenance regime.

**b) Maintenance of Roads, Pedestrian Walkways and Bicycle Paths**

Lack of maintenance of roads, pedestrian walkways and bicycle paths may cause certain environmental impacts such as air pollution and enhanced city's carbon footprint due to traffic congestion and use of motorized transport. LCs staff will maintain these roads, pedestrian walkways and bicycle paths throughout project life to improve urban air quality.

**c) Landscaping to Improve Aesthetic of the Sites**

The aesthetic of the sites such as storm water drains and municipal roads will be improved by landscaping. The green spaces will be developed at these sites to create their positive image among nearby community.

## 6.0 STAKEHOLDER CONSULTATION

This chapter describes the objective, process, and outcome of the stakeholder consultations carried out before or during the preparation of Environmental Management Framework (EMF).

### 6.1 Requirement of Stakeholder Consultation

It is one of the essential requirements of International Bank for Reconstruction and Development (IBRD) or International Development Association (IDA) financing, during the environmental assessment process, LCs should consult project affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and take their views into account. LCs recognize the importance of early and continuing engagement and meaningful consultation with stakeholders. LCs will engage the stakeholders, including communities, groups, or individuals affected by proposed projects, and with other interested parties, through information disclosure, consultation, and informed participation in a manner proportionate to the risks to and impacts on affected communities. The Bank will also participate in consultation activities to understand the concerns of affected people, and how such concerns will be addressed by LCs in project design and mitigation measures. The PMU and Bank will monitor, as part of its due diligence, the implementation of consultation and stakeholder engagement by LCs.

Citizens will be involved in identification and prioritization of capital investments by LCs through extensive consultations and participatory planning taking place numerous times a year. To receive performance-based capital grants, LCs will be required to meet a Performance Measure on citizen engagement every year, conducting numerous open meetings at a disaggregated community level, separately for men and women where possible. In total there are expected to be more than one hundred open meetings for citizens every year across the city, aggregated across all LCs. Another Performance Measure will improve transparency and access to information for all, by developing and updating ULG websites containing information on capital investment plans and links to the LCs' grievance redress systems. KMC's existing Citizen Complaint & Information System (CCIS), available for citizens in Karachi, will be strengthened and similar systems established in each DMC, open to all citizens.

### 6.2 Process of Stakeholder Consultation

LCs supported by the ESC in the PMU, will undertake a process of meaningful consultation in a manner that provides stakeholders with opportunities to express their views on individual sub project risks, impacts, and mitigation measures, and allows the LCs to consider and respond to them. Meaningful consultation will be carried out on an ongoing basis as the nature of issues, impacts and opportunities evolves. Meaningful consultation is a two-way process, that:

- a) Begins early in the project planning process to gather initial views on the project proposal and inform sub project design;
- b) Encourages stakeholder feedback, particularly as a way of informing project design and engagement by stakeholders in the identification and mitigation of environmental and social risks and impacts; continues on an ongoing basis, as risks and impacts arise;
- c) Is based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information in a timeframe that enables meaningful consultations with stakeholders in a culturally appropriate format, in relevant local language(s) and is understandable to stakeholders;
- d) Considers and responds to feedback;
- e) Supports active and inclusive engagement with project-affected parties;
- f) Is free of external manipulation, interference, coercion, discrimination, and intimidation; and
- g) Is documented and disclosed by LCs

### **6.3 Identification of Stakeholders**

Stakeholder” refers to individuals or groups who:

- a) are affected or likely to be affected by the project (*project-affected parties*); and
- b) may have an interest in the project (*other interested parties*)

For CLICK, the relevant stakeholders include affected communities (which are directly or indirectly affected by the project activities, the representatives of Karachi Metropolitan Corporation and six District Municipal Corporations, NGOs, Community Based Organizations (CBOs), civil society, Local Government Departments, Sindh Environmental Protection Agency (SEPA) staff.

### **6.4 Environmental Management Framework (EMF) Consultation and Disclosure**

The consultation is required with the stakeholders regarding the potential environmental risks and impacts of the proposed project/subprojects as part of the EMF document before or during its preparation. At this point in time during preparation of the CLICK, the details about the project/subprojects and their exact locations are not known, therefore, it is not possible to engage community and carry out the consultation for those projects which are not yet known. However, on April 3, 2019, LCs conducted consultation workshop in Karachi with the community and institutional stakeholders such as representatives of Karachi Metropolitan Corporation, six District Municipal Corporations, NGOs, Community Based Organizations (CBOs) etc. after the completion of draft version of the EMF. In this consultation workshop, the tentative projects were described and potential generic environmental impacts were discussed and consulted with the representatives. The feedback, comments and suggestions from the community stakeholders during the workshop were recorded and used in identifying the environmental concerns of the affected community and proposing mitigation measures in the EMF.

The participants of the workshop were of the view that in addition to repair and maintenance of existing roads, the project should also consider construction of new roads, flyovers, underpasses etc. to improve the traffic flow in the city. Stakeholders advised that LCs should learn from the experience of World Bank’s ongoing infrastructure project (Karachi Neighborhood Improvement Project-KNIP) while designing infrastructure subprojects for CLICK. One of the participant inquired about the possibility of installation of incineration at primary health facilities. LCs represented responded that incineration is not eligible under CLICK sub-projects.

Proceedings of the consultation workshop is attached as Annexure-1.

LCs representatives committed that after the project locations will be identified and technical details will be available for each component of the project, Focused Group Discussions (FGDs) will be carried out with the directly affected stakeholders. These FGDs will provide complete details of the project activities to the concerned stakeholder and will get their relevant feedback, concerns and suggestions to be considered in the planning for offsetting environmental risks and impacts in the EMF. The EMF will be finalized in the light of these stakeholder consultations.

### **6.5 Proceedings of the Stakeholder Consultations**

Preliminary stakeholder consultations were carried out during field visits prior to the preparation of EMF. The summary of the consultations is as under:

LCs conducted preliminary consultations with Districts managements and a few community representatives. Districts management are mostly involved in rehabilitation of infrastructure activities, IEEs/EIAs for such activities were not required by SEPA. Accordingly, no environmental assessment exercises were conducted in the past. Consequently, environmental assessment and monitoring capacities are non-existent at the LCs.

Community representatives reported that communities were facing poor environmental conditions with very low level of water supply and sanitation services. Communities living along the main drains and rivers are facing serious environmental issues and generally public health is at low level. Most of the representatives of the communities reported that water supply was intermittent, erratic, and contaminated. During rainy reasons, most of the area was flooded by rain and sewerage water that led to serious health issues and inconvenience to the communities.

## 7.0 ENVIRONMENTAL MANAGEMENT FRAMEWORK

This chapter describes institutional arrangements for environmental management, screening methodology for the projects, generic mitigation plan, monitoring framework, and capacity building of stakeholders involved in environmental assessment, monitoring and management.

### 7.1 Institutional Arrangement

The institutional arrangement for the environmental and social assessment of CLICK project is presented in Figure 8.

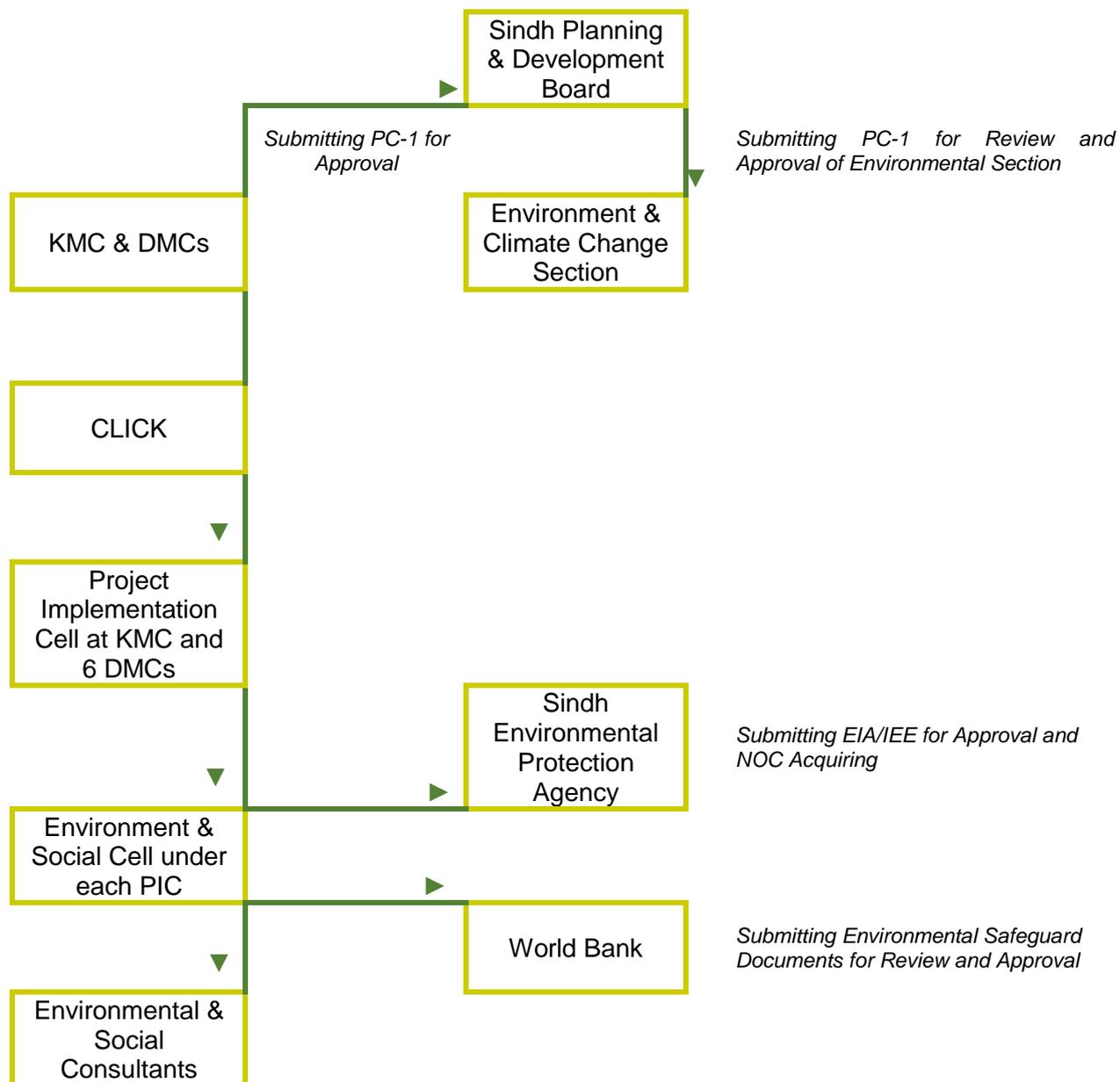
The proponent KMC and six DMCs will be responsible for the compliance of environmental safeguard requirements of the CLICK project components. The PC-1 of the project components, including environmental compliance requirements, will be prepared by LCs and submitted to Sindh Planning and Development Board (SPDB) for approval and subsequent stages of the project. The Environmental and Climate Section of SPDB will review and approve the environmental requirements of the PC-1.

The project activities at LCs will be monitored and managed by the Project Management Unit (PMU), to be established specifically for CLICK. PMU will be established in Local Government Department (LGD), Government of Sindh. The Environmental and Social Cell (ESC) staffed by qualified environmental and social specialist will be established under PMU. The ESC will be custodian of the EMF. ESC will support the LCs to ensure the EMF, SEPA 2014, and World Bank operational policies compliance of the eligible sub-projects, when they are identified.

### 7.2 World Bank Environmental Review Project Cycle

Environmental review begins with screening at the time of project identification. Scoping and preparation of the Environmental and Social Management Plans (ESMPs) occur in tandem with or as integral parts of the prefeasibility and feasibility studies. The final sub project ESMPs are sent to the Bank, by PMU prior to sub project approval. If the ESMPs are satisfactory and acceptable to KMC, DMCs and the Bank, it forms the basis for the decision to approve the sub project for funding.

Figure 8: Institutional Arrangement for Environmental Assessment of CLICK



### 7.3 Environmental Screening

Under World Bank's Operational Policy 4.01 (Environmental Assessment), the bank requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that these are environmentally sound and sustainable, and thus to improve decision making. First step of the environmental assessment is the screening.

Environmental screening is the responsibility of the KMC or DMCs, as sub-project owners, with advice and assistance by the ESC. An essential part of screening is to identify which aspects of a project are not environmentally significant and which therefore can prudently be dropped from further consideration. Its purposes are to ensure that the appropriate amount of attention is devoted to the environmental aspects of the proposed project from the very outset of the project cycle, to identify as much as possible the key environmental issues, and to determine the type of environmental analysis which is needed so that those issues, and others which may arise, can be addressed effectively in project planning, design, and appraisal.

Screening of the sub-projects is to be carried out at the time of identification and aligned with the local planning process and cycle of the KMC and/or DMC. The environmental screening of each

proposed sub-project shall be carried out to determine the appropriate extent and type of EA document required. The Bank classifies the proposed project into following one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts and so designated in the Initial Executive Project Summary (IEPS).

**Category A:** A proposed sub-project is classified as Category A, if its potential adverse environmental impacts, on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, are likely to be widespread, intense and long lasting, requiring sustained and complex mitigation and other management measures.

**Category B:** A proposed sub-project is classified as Category B, if its potential adverse environmental impacts, on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation (Project Appraisal Document and Project Information Document).

**Category C:** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

**Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

**Both Category A and FI sub projects are NOT eligible for financing under the CLICK project.**

Screening checklist is attached as Annexure-2.

Bank and international experience shows that projects in certain sectors or of certain types are normally best classified as illustrated below in Box-A. These examples are only illustrative; they are by no means exhaustive.

BOX-A		
Illustrative List		
Category A Projects	Category B Projects	Category C Projects
a) Dams and reservoirs;	(a) Agro-industries (small-scale);	(a) Education;
(b) Forestry production projects;	(b) Electrical transmission;	(b) Family planning;
(c) Industrial plants (large-scale) and industrial estates;	(c) Aquaculture and mariculture;	(c) Health;
(d) Irrigation, drainage, and flood control (large-scale);	(d) Irrigation and drainage (small-scale);	(d) Nutrition;
(e) Land clearance and leveling;	(e) Renewable energy;	(e) Institutional development;
	(f) Rural electrification;	

- |   |  |                                   |
|---|--|-----------------------------------|
| (f) Mineral development (including oil and gas);  | (g) Tourism;   | (f) Technical assistance; and     |
| (g) Port and harbor development;  | (h) Rural water supply and sanitation;                                 | (g) Most human resource projects. |
| (h) Reclamation and new land development;   | (i) Watershed projects (management or rehabilitation); and             |                                   |
| (i) Resettlement and all projects with potentially major impacts on people;                       | (j) Rehabilitation, maintenance, and upgrading projects (small-scale). |                                   |
| (j) River basin development;  |  |                                   |
| (k) Thermal and hydropower development; and   |  |                                   |
| (l) Manufacture, transportation, and use of pesticides or other hazardous and/or toxic materials. |  |                                   |

Source: World Bank Environmental Source Book 1999

Note: Category C projects can also fall under category A or B, depending on the type of project activities and severity of the environmental impacts of these activities

## 7.4 Environmental Assessment (EA)

All eligible sub-projects will only require an Environmental and Social Management Plan (ESMP). The ESC will support the LCs to prepare ESMPs using the guidelines presented in Box-B. After ESMP will be prepared, consultations on the ESMP will be held and ESMP will be disclosed in the sub-project area. After incorporating the comments raised during the consultations, the ESMP will be incorporated in the sub-project documents, including the civil works contract for the sub-project. Finally, the sub-project documents (including the ESMP) will be submitted for approval.

### Box-B

#### ESMP Guidelines for Sub-Projects

When a subproject includes distinct mitigation measures (physical works or management activities), an Environmental and Social Management Plan (ESMP) needs to be included with the subproject application.

#### **Sub-Project ESMP General Format/ Contents:**

An ESMP usually includes the following components:

Description of adverse effects: The anticipated effects are identified and summarized.

Description of mitigation measures: Each measure is described with reference to the effect(s) it is intended to deal with. As needed, detailed plans, designs, equipment descriptions, and operating procedures are described.

Description of monitoring program: Monitoring provides information on the occurrence of environmental and social effects. It helps identify how well mitigation measures are working, and where better mitigation may be needed. The monitoring program should identify what information will be collected, how, where and how often. It should also indicate at what level of effect there will be a need for further mitigation. How environmental and social effects are monitored is discussed below.

Responsibilities: The people, groups, or organizations that will carry out the mitigation and monitoring activities are defined, as well as to whom they report and are responsible. There may be a need to train people to carry out these responsibilities, and to provide them with equipment and supplies.

Implementation schedule: The timing, frequency and duration of mitigation measures and monitoring are specified in an implementation schedule, and linked to the overall subproject schedule.

**Cost estimates and sources of funds:** These are specified for the initial sub-project investment and for the mitigation and monitoring activities as a subproject is implemented. Funds to implement the EMP may come from the subproject grant, from the community, or both. Government agencies and NGOs may be able to assist with monitoring.

**Monitoring Methods:**

Methods for monitoring the implementation of mitigation measures or environmental effects should be as simple as possible, consistent with collecting useful information, so that community members can apply them themselves.

**All sub project selection and corresponding ESMPs must be prior reviewed by the World Bank and will require the “no-objection” of the World Bank before any sub project will be eligible for financing by the CLICK project.**

**Implementation and Supervision:** EA recommendations provide the basis for supervising the environmental aspects of project implementation. LCs with support from LGD will implement measures to mitigate anticipated environmental impacts, to monitor programs, to correct unanticipated impacts, and to comply with any environmental conditionality. Procedures for startup and continuing operation of the project will normally specify these agreements, as well as measures to protect the health and safety of project staff. Proper staffing, staff training, and procurement of spare parts and equipment to support preventive, predictive and corrective maintenance are also necessary elements of implementation. Additional support will be provided by LGD for EA during implementation and supervision to ensure full compliance with the environmental safeguards policy.

**7.5 Environmental Assessment Requirement of Sindh Environmental Protection Agency (SEPA)**

The Sindh Environmental Protection Agency Review of the IEE and EIA Regulations, 2014 categorizes development projects into three schedules, according to their anticipated potential environmental impact. The project will not finance any sub-project that requires EIA. The proponents of projects with the potential for less environmental impact (see Schedule I), must submit an Initial Environmental Examination (IEE) with the respective environmental protection agency (EPA). The proponent of the projects falling under Schedule III shall conduct screening and file environmental checklist. Box-C presents Schedule I, II and III.

The Regulations also provide the necessary details on the preparation, submission, and review of IEEs. The following is a brief step-by-step description of the approval process:

1. To determine whether a sub-project is categorized as requiring an IEE or screening, as per the three schedules attached to the Regulations.
2. An IEE or screening is conducted as per the requirements outlined in the SEPA Guidelines.

<b>BOX-C</b>		
<b>SEPA’s Environmental Assessment Schedules</b>		
<b>Schedule I (IEE)</b>	<b>Schedule II (EIA)</b>	<b>Schedule III (Checklist)</b>
<b>A. Agriculture, Livestock and Fisheries</b>	<b>B. Oil and Gas Projects</b> 1. Petroleum refineries.	a. Construction of, offices and small commercial buildings (1-6 story),home industrial units, ware houses, marriage / banquet

1. Poultry, livestock, stud and fish farms
2. Projects involving packaging, formulation, cold storage and warehouse of agricultural products.

**B. Energy**

1. Hydroelectric power generation less than 50 MW
2. Thermal power generation less than 100MW
3. Coal fired power plants with capacity less than 50 MW
4. Transmission lines less than 11 KV, and grid station
5. Waste-to-energy generation projects including bio-mass less than 25 MW
6. Solar project
7. Wind project

**C. Oil and Gas Projects**

1. Oil and gas 2D/3D Seismic survey and drilling activities
2. Oil and gas extraction projects including exploration and production located outside the environmentally sensitive areas
3. Construction of LPG storage facilities
4. Construction of LPG,CNG filling station and petrol pumps

**D. Manufacturing and Processing**

1. Ceramics and glass units less than 500 million

2. LPG and LNG Projects(including LNG Terminals, re-gasification units) except LPG filling stations
3. Oil and gas transmission systems
4. Oil and gas gathering system, separation and storage.

**C. Manufacturing and Processing**

1. Cement plants
2. Chemical manufacturing industries
3. Fertilizer plants
4. Steel Mills
5. Sugar Mills and Distilleries
6. Food processing industries including beverages, dairy milk and products, slaughter houses and related activities with total cost more than Rs. 200 Million
7. Industrial estates (including export processing zones)
8. Man-made fibers and resin projects with total cost of Rs 200 M and above
9. Pesticides (manufacture or formulation)
10. Petrochemicals complex
11. Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel),printing and publishing, paints and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs. 10 million
12. Tanning and leather finishing projects
13. Battery manufacturing plant

**D. Mining and Mineral Processing**

1. Mining and processing of coal, gold, copper, sulfur and precious stones
2. Mining and processing of major non-ferrous metals, iron and steel rolling
3. Smelting plants (total cost of Rs. 100 M and above)

**E. Transport**

1. Airports

facilities, large scale motor vehicles workshops, restaurants / food outlets ,large baking unit subject to the compliance with existing zoning laws.

- b. Reconstruction / rehabilitation of roads (small roads in urban area and farm to market roads more than 2 km).
- c. On-farm dams and fish farms.
- d. Pulses mills.
- e. Flour Mills
- f. Projects promoting energy efficiency (small scale).
- g. Lining of existing minor canals and /or water courses.
- h. Canal cleaning
- i. Forest harvesting operations
- j. Rain harvesting projects
- k. Rural schools (Secondary and Higher Secondary) and rural and basic health units having at least ten beds capacity.
- l. BTS Towers
- m. Lime Kilns
- n. Ice factories and cold storage.
- o. Cotton oil mill
- p. Warehouses for pesticides and pharmaceuticals

2. Food processing industries with total cost less than Rs. 200 millions

2. Federal or Provincial highways or major roads (including rehabilitation or rebuilding or reconstruction of existing roads)

#### Schedule II (EIA)

##### A. Energy

1. Hydroelectric power generation over 50 MW

3. Ports and harbor development

4. Railway works

5. Flyovers, underpasses and bridges having total length of more than 500 m

2. Thermal power generation over 100 MW

##### F. Water Management, Dams, Irrigation and Flood Protection

3. Coal power projects above 50 MW

1. Dams and reservoirs with storage volume of 25 million cubic meters and above having surface area of 4 square kilometers and above

4. Transmission lines (11 KV and above) and distribution projects.

2. Irrigation and drainage projects serving 15,000 hectares and above

5. Nuclear power plants

3. Flood Protection

6. Wind energy projects if falls under any sensitive, protected area.

##### G. Water Supply and Filtration

Large Water supply schemes and filtration plants.

Source: SEPA Review of IEE & EIA Regulations, 2014

3. The Fee (depending on the cost of the sub-project and type of report) is submitted along with the IEE document.
4. The IEE is also accompanied by an application in the format prescribed in Schedule V of the Regulations.
5. The EPA conducts a preliminary review of the report and replies within 15 days of the submission. It either a) confirms completeness, or b) asks for additional information, if needed, or c) returns the report and asks for additional studies, if necessary.
6. The Agency shall make every effort to carry out its review of the environmental checklist within thirty days, and IEE within sixty days of issue of confirmation of completeness under regulation 9.
7. The EPA accords their approval, subject to certain conditions:
  - a. Before commencing construction of the sub-project, the proponent is required to submit an undertaking accepting the conditions.
  - b. Before commencing operation of the sub-project, the proponent is required to obtain from the SEPA a written confirmation of compliance with the approval conditions and requirements of the IEE.
8. An Environmental Management Plan (ESMP) is to be submitted with a request for obtaining confirmation of compliance.
9. The SEPA is required to issue confirmation of compliance within 20 days of receipt of the request and complete documentation.
10. The IEE approval is valid for three years from the date of operational phase NOC.

11. After completion of construction, a monitoring report is to be submitted to the SEPA, followed by annual monitoring reports, during operations.

## 7.6 Categorization of CLICK Subprojects

On the basis of above mentioned guidelines of World Bank and Sindh Environmental Protection Agency (SEPA), the preliminary assessment of the categorization of the CLICK subprojects and environmental assessment requirements are given in Table 12.

For small drainage repair and rehabilitation projects, pedestrian walkways and bicycle paths, development and rehabilitation of parks and green areas, rehabilitation of existing primary health facilities and schools, public toilets and rehabilitation of fire control stations, SEPA does not require any environmental assessment. The repair and rehabilitation of roads and streets, would require checklists only under SEPA.

The repair and rehabilitation of drains and flood control system, and repair and rehabilitation of roads and streets will most probably category B projects. The development and rehabilitation of parks and green areas, pedestrian walkways and bicycle paths, rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations would be category C projects under World Bank, requiring no EA after screening stage.

Table 9: Preliminary Categorization and EA Requirements of CLICK Subprojects

CLICK Subprojects	Categories & Requirements			
	World Bank	SEPA		
	Category	EA Required	Schedule	EA Required
Repair & rehabilitation of drains and flood control system under LCs	B	EA Assessment Required. ESMP needs to be prepared.	Nil or Schedule II	Not Required or IEE
Repair and rehabilitation of roads, streets, signalized intersections etc. under LCs	B	EA Assessment Required. ESMP needs to be prepared.	Schedule III	Checklist
Pedestrian sidewalks & walkways, bicycle paths, pedestrian bridges and crossings	C	No EA Required after Screening	Nil	Not Required
Parks, playgrounds, greenery, recreation facilities, public spaces, street furniture, landscaping, tree plantation	C	No EA Required after Screening	Nil	Not Required
Rehabilitation of existing primary health facilities and schools buildings operated by DMCs	C	No EA Required after Screening	Nil	Not Required
Public toilets, especially for women	C	No EA Required after Screening	Nil	Not Required
Rehabilitation of fire control stations and facilities	C	No EA Required after Screening	Nil	Not Required

Following sub projects shall not be considered for the implementation:

- Sub-projects, which have large environmental or social impacts;
- Projects which will require extensive land acquisition;

- Sub projects located at any site affected (or to be covered) by the ongoing anti-encroachment drive, as the conduct of that drive does not comply with WB social safeguard policies

**Category C Subprojects** Above mentioned C category subprojects will undergo screening as per screening checklist attached. Screening will decide whether C category subprojects need environmental management during construction phase or not (on the basis of environmental impacts significance assessment). In case environmental management is required then ESMP will be prepared and appended with the contractor's tender document. Contractor will have to comply the ESMP and ESC of PMU will ensure its compliance.

## **7.7 Generic Mitigation Plan**

Table 13 presents generic mitigation plan for the avoiding or mitigating the potential environmental impacts identified above.

Table 10: Generic Mitigation Plan

<b>Subproject (s):</b> <i>Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations</i>			
<b>Potential Environmental Impacts</b>	<b>Mitigation Measure</b>	<b>Responsibility</b>	<b>Implementation Stage</b>
<b>Construction Phase</b>			
<b>Vegetation</b> Top soil removal, air pollution, soil erosion and disturbance to aesthetic of the area due to clearing of land for camp sites, laying pipelines and building infrastructure	<b>Restoration of the Construction Sites</b> Where grading or excavation occurs within farmland, topsoil will be separated and stockpiled during the construction period. The topsoil stockpile will be secured with plastic. Following construction, the topsoil will be applied evenly to the site during the restoration process. The topsoil will be properly compacted and stabilized to prevent erosion and sediment transport.  During the design stage of the project and finalizing the project location and alignment for the drains, it will be the priority to avoid those areas where there are chances of cutting of significant number of trees and clearing of vegetation/crops. <b>Tree Plantation</b> In case if it is not possible to avoid the cutting of the trees, then the project site would be restored to its original as much as possible by planting trees, vegetation and crops at the cleared land. All works will be carried out in a fashion that ensures minimum damage or disruption to the flora.	Contractor	Start and end of construction
		Designer	Design
		Contractor	End of construction
<b>Natural Habitats</b> Disturbance to natural habitats and biodiversity during construction activities	<b>Protection of Natural Habitats</b> During site selection and finalization of drains and roads alignment, the protection of the natural habitats will be the high priority area. Alternatives will be considered for site selection and drains and roads alignments, in case of presence of natural habitats at the project areas to protect them at best.  During environmental assessment, surveys will be conducted for rare plants and priority or endemic wildlife species prior to civil work activities at all the sites. If any rare plants or sensitive wildlife species occur at the construction sites, the sensitive	Designer	Design
		Contractor	During construction

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
	<p>resource will be fenced, and no activities will be allowed within 15 meters (50 feet) of the resource.</p> <p>Construction activities will be scheduled outside of the prime bird nesting season to the extent feasible. If construction activities occur during the prime nesting bird season, these will be conducted at least 75 meters (250 feet) from the forested areas where suitable nesting habitat for priority bird species may be located.</p> <p>Prior to construction activities during the nesting season, a qualified biologist will survey potentially suitable nesting habitat for priority species birds. If active nests are identified, a qualified biologist will monitor the nesting birds' responses to the loudest level of construction noise for an appropriate duration. If the nesting birds show signs of disturbance that could result in nest failure, all work activities that disturb the birds will be temporarily halted and visual and acoustic barriers will be erected between the nesting location and work areas. Installation of any visual and acoustic barriers will be overseen and approved by the qualified biologist.</p>	<p>Contractor</p> <p>Biologist</p>	<p>During construction</p> <p>During environmental assessment</p>
<p><b>Physical Cultural Resources (PCRs)</b> Disturbance to PCRs at the project sites during construction activities</p>	<p><b>Protection of Physical Cultural Resources (PCRs)</b> During environmental assessment, surveys will be conducted for archeological and cultural resources prior to civil work activities at all the sites.</p> <p>All necessary and adequate care will be taken to minimize impact on cultural properties which includes cultural sites and remains, places of worship including mosques, churches, etc., graveyards, monuments and any other important structures as identified during design and all properties / sites / remains</p>	<p>Environmentalist</p> <p>Designer</p>	<p>During environmental assessment</p> <p>Design</p>

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
	<p>notified. The design options for cultural property relocation and enhancement need to be prepared.</p> <p>No work will spill over to these properties, premises and precincts. All conservation and protection measures will be taken up as per design. During earth excavation, if any property is unearthed and seems to be culturally significant or likely to have archaeological significance, the same shall be intimated to the KMC/DMCs. Work will be suspended until further orders from the KMC/DMCs. The Archaeological Department will be intimated of the chance find and the KMC/DMCs will carry out a joint inspection with the department. Actions as appropriate will be intimated to the Contractor along with the probable date for resuming the work. The contractor workers will be sensitized and fully informed about the importance of PCRs before the commencement of the work as their negligence during excavation and construction activities could damage these resources. All fossils, coins, articles of value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site will be the property of the Government, and will be dealt with as per provisions of the relevant legislation.</p>	Contractor	During construction
<p><b>Air Quality</b> Air pollution resulting in poor visibility, loss of vegetation, property damages, soil contamination and health implications on workers and nearby community due to fugitive emissions of dust (SPM, PM<sub>10</sub>, PM<sub>2.5</sub>), stack, vehicular emissions and asphalt fumes from asphalt plant and during spraying of asphalt on roads during construction activities</p>	<p><b>Suppression of Dust Emission</b> Regular water sprinkling will be the responsibility of the contractor at the dust generation points, during construction activities. The water will also be sprinkled at vehicular and machinery movement routes to avoid dust spreading to the nearby community. In addition, the provision of dust masks and ensuring their use by the workers will also be the responsibility of the contractor under Construction Phase Environmental and Social Management Plan (ESMP).</p>	Contractor	During construction



**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

<b>Potential Environmental Impacts</b>	<b>Mitigation Measure</b>	<b>Responsibility</b>	<b>Implementation Stage</b>
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flies), surface water and soil contamination due to improper disposal of domestic and hazardous solid waste from construction camps and construction waste

plan will address the sources of waste; waste minimization, reuse, and recycling opportunities; and waste collection, storage, and disposal procedures. The Waste Management Plan would distinguish between solid and liquid waste, as applicable, and include procedures for addressing waste that may be hazardous to health and the environment. In addition, the Waste Management Plan will address the following:

- All food waste will be contained in covered bins and disposed of on a frequent basis to avoid attracting wildlife.
- Trash bins will be accessible at all locations where waste is generated.
- The project area will be kept clean and free of litter and no litter will be allowed to disperse to the surrounding area.
- Solid waste will be removed from the site and transported to a municipal landfill or disposal site.
- Waste will not be dumped or buried in unauthorized areas or burned.
- Human waste associated with the worker camp and latrines will be properly contained and disposed of.

The construction contractors will ensure that all workers receive training on proper disposal of all waste prior to working on the project site.

The debris produced during construction would preferably be dumped at nearby depressions rather than being thrown away and left unattended. Leftover material will not be dumped into storm water drains or watercourses, because such practices can clog these man-made and natural drainage systems and cause many other problems for the residents.

**Hazardous Solid Waste Management**

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

<b>Potential Environmental Impacts</b>	<b>Mitigation Measure</b>	<b>Responsibility</b>	<b>Implementation Stage</b>
	<p>The construction contractors will implement the Hazardous Solid Waste Management Plan (mentioned in ESMP). The Hazardous Solid Waste Management will identify proper management procedures for all hazardous materials and wastes that may be encountered during construction, including handling, labeling, transporting, and storing procedures. In addition, the plan will address the following:</p> <ul style="list-style-type: none"><li>• Non-toxic and biodegradable produces will be used whenever possible.</li><li>• Hazardous materials will be transported and stored in appropriate containers with clearly visible labels. Hazardous materials will be stored at least 100 feet from any down gradient drainage or within secondary containment capable of containing its entire volume.</li><li>• Storm water flows will be directed away from hazardous material storage areas.</li><li>• Equipment and work areas will be regularly inspected for signs of leaks and spills. Spill containment and cleanup kits will be available wherever hazardous materials will be used or stored. Any incidental spills or leaks will be contained and cleaned up as soon as it is safe to do so. Contaminated soil will be collected and disposed of in an appropriate land fill.</li><li>• Equipment refueling and maintenance will be limited to designated areas at least 30 meters (100 feet) from any down gradient drainage.</li></ul> <p>All workers will receive training on proper handling and storage of hazardous materials, as well as spill response and cleanup procedures, prior to working on the project site.</p>		
<b>Soil</b> Soil contamination due to storage of oily parts and oily rags on unpaved floors, spillage and	<b>Soil Pollution Control</b> Soil pollution will be controlled by taking following measures:	Contractor	During construction

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
leakage of chemicals, fuel, and lubricants on soil (construction camps/sites)	<ul style="list-style-type: none"> <li>- Storage of fuel, paint, and oil containers, oil filters, oily parts and oily rags on impervious floor under shade or storing of fuel and lubricants on a sand flooring of at least 6 inch thick, done on brick edge flooring lined with polyethylene sheet</li> <li>- Placement of fuel containers under containment and proper decantation arrangement to avoid its spillage and leakage on floor</li> <li>- Presence of spill kit to remove spills from the floor</li> <li>- Avoidance of washing the contaminated floors rather dry cleaning the spills from the floor with saw dust and rags</li> <li>- Location of fuel storage and refilling areas at least 500 m from all cross drainage structures and important water bodies</li> </ul>		
<p><b>Noise</b> Nuisance, health implications of workers and nearby community, loss of biodiversity due to noise from construction machineries, generators, construction activities and vehicular movement</p>	<p><b>Noise Abatement</b> Construction noise and the associated effects will be reduced or minimized, to the extent possible, by implementing the following procedures:</p> <ul style="list-style-type: none"> <li>• Selection of quieter equipment;</li> <li>• Carrying out regular inspection and maintenance of the construction vehicles and equipment;</li> <li>• Replacement of worn and noise producing parts of construction machinery in a timely manner;</li> <li>• Ensuring that motorized vehicles and equipment are equipped with the greatest possible noise reduction parts, such as mufflers, silencers, insulators, and enclosures;</li> <li>• Workers will use noise protection equipment when working in a noisy area;</li> <li>• Placing noise generating equipment as far from sensitive receptors as feasible;</li> <li>• Limiting civil work activities to daytime hours (8:00 to 18:00), to the extent feasible;</li> </ul>	Contractor	During construction

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
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- Notifying and coordinating with residents adjacent to project areas prior to construction to inform them of the possibility of temporary noise disruption, and how to report noise complaints;
- Installation of acoustic barriers between stationary equipment and sensitive receptors located within 300 meters (1,000 feet);
- Implementing a Noise Complaint Program to record and respond to noise complaints during construction

**Health and Safety**

Safety hazards for workers and community due to construction activities/sites

**Occupational Health and Safety Management**

The construction contractors will implement a Health and Safety Plan (mentioned in ESMP) that addresses the applicable risks and prevention procedures applicable to each contractor's work. At a minimum, the Health and Safety Plan will address hazards that may be encountered during construction, including prevention and response procedures, for the following topics:

- General occupational hazards that may be encountered (e.g., moving machinery and motorized equipment, working at heights or in confined spaces, repetitive motions, falling objects, exposure to heat, loud noises, and hazardous materials, protective clothing).

The risk of fires will be evaluated for each project site based on the activities that would occur, environmental conditions, and presence of ignitable or combustible materials in the area. If the activities pose a risk of igniting a wildfire, appropriate fire prevention and response equipment will be available at each active site such as shovels, axes, fire extinguishers, and dedicated water tanks. All workers will be trained on proper fire prevention and response procedures prior to working on the site. Any smoking on site will be restricted to barren areas away

Contractor

During construction

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

<b>Potential Environmental Impacts</b>	<b>Mitigation Measure</b>	<b>Responsibility</b>	<b>Implementation Stage</b>
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from ignitable or combustible material. Smoking waste will be fully extinguished and disposed of appropriately.

The construction contractors will supply all workers with personal protective equipment (PPE), and ensure workers use the proper PPE during all work activities. At a minimum, PPE for workers will include:

- Safety headgear
- Steel toed boots
- Safety glasses or impact-resistant eye protection
- Ear protective devices
- Harnesses for workers operating at heights
- Respirators
- Gloves
- High visibility clothing or vests
- Other specialized protective equipment for the drilling, welding, etc.

All PPEs will be properly fitted for each worker, including body size and gender, and workers will be trained in the proper use of PPEs, prior to working on the project site.

Medical facilities will be provided to the labor at the construction camp. Suitable transport will be provided to take injured or ill person(s) to the nearest approachable hospital. First Aid Box will be provided at every construction campsite and under the charge of a responsible person who will always be readily available during working hours. The contractor will be responsible for providing safe drinking water and for implementing appropriate sanitation conditions, and for supplying hygienic food and a sewerage system for the construction team at the site.

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
	<p>The construction activities, particularly the excavation, will not be carried out during rainy season to avoid any accident. The excavated areas will be properly cordoned off, and warning and safety signs will be posted at accident prone areas to warn the passersby the potential danger at the construction site. The traffic will be diverted well before the construction area as per the traffic management plan. The construction contractors will install temporary signs and fences around all unsafe areas to prevent members of the public from entering the areas. If installing fences is not feasible, the area will be clearly identified as unsafe with signs and flagging.</p>		
<p><b>Damaging of Underground Utilities Lines</b> There are chances that the excavation and road side construction activities could damage the underground utilities lines of telephone, water, gas, electricity etc.</p>	<p><b>Protection of Underground Utilities Lines</b> The contractor will coordinate with different utility companies to identify if their lines are present in the road construction sites. In case if these are present, the excavation will be done carefully to avoid damaging these. In case of any damage, the respective department will immediately be informed and called. The repair of the utility lines will be the utmost priority of the contractor.</p>	Contractor	During construction
<p><b>Traffic</b> Traffic congestion at or around construction sites due to construction activities</p>	<p><b>Traffic Management</b> At all times, the Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock. The contractor will comply the Traffic Management Plan (TMP) as provided in ESMP. The traffic control plans will contain details of temporary diversions at different locations. Temporary diversion for road traffic will be constructed with the approval of the KMC/DMCs. Special consideration will be given in the preparation of the traffic control plan to the safety of pedestrians and workers at night. The temporary traffic detours in settlement areas will be kept free of dust by frequent application of water. The contractor will take all necessary measures for the safety of</p>	Contractor	During construction

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
	<p>traffic during construction work and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required for the information and protection of traffic approaching or passing through the construction site. All signs, barricades, pavement markings will be as per road specification.</p> <p>Informational signs will be posted where lane and road closures could substantially disrupt traffic circulation at least 7 days prior to the closure. Proper traffic controls will be in place during closures to minimize impacts on traffic circulation and for traffic safety. Appropriate safety precautions will be taken when transporting large equipment on public roadways.</p>		
<p><b>Campsite</b> Disturbance to aesthetic and landscaping of the campsites</p>	<p><b>Campsites Restoration</b></p> <p>After the completion of construction activities at each site, all construction camp facilities will be dismantled and removed from the site. The site will be restored to a condition in no way inferior to the condition prior to commencement of the works. Various activities to be carried out for site rehabilitation include:</p> <ul style="list-style-type: none"><li>• Oil and fuel contaminated soil will be removed and transported and buried in waste disposal areas.</li><li>• Soak pits, septic tanks will be covered and effectively sealed off.</li><li>• Debris (rejected material) will be disposed of suitably.</li><li>• Underground water tank in a barren/non-agricultural land will be covered. However, in an agricultural land, the tank will be removed.</li><li>• If the construction camp site is on an agricultural land, top soil will be preserved and good earth will be spread back for a minimum 30 cm for faster rejuvenation of the land.</li><li>• In cases, where the construction camps site is located on a private land holding, the contractor would still have to</li></ul>	<p>Contractor</p>	<p>After the completion of construction activities</p>

**Subproject (s):**

*Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Potential Environmental Impacts	Mitigation Measure	Responsibility	Implementation Stage
	restore the campsite as per this specification. The rehabilitation is mandatory and will be included in the agreement with the landowner by the contractor. Also, the contractor would have to obtain a certificate for satisfaction from the landowner.		
<b>Lighting Fixtures</b> Energy wastage due to inefficient lighting fixtures	<b><u>Installation of Energy Efficient Lighting Fixtures</u></b> It will be ensured to install energy efficient lighting fixtures at all the building infrastructure during design and construction stages of the project	Designer and Contractor	Design and construction
<b>Operational Phase</b>			
Drains and Flood Control Systems, Roads, Streets, Pedestrian Walkways and Bicycle Paths			
<b><u>Environmental Impacts due to Improper Maintenance of Drains</u></b> Soil and water contamination, odor and outbreak of diseases due to leakages and damaging and overflowing of storm water drains	<b><u>Maintenance of Storm Water Drains</u></b> It will be the responsibility of KMC/DMC staff to look after the proper functioning of the drainage system throughout the project lifecycle. For such system, KMC/DMC will be equipped with proper trained workforce and requisite machinery with the support of vigilant governance system. Regular maintenance and upkeep of these drains will be under strict operation and maintenance regime.	Director General Tech./Sr. Director/Municipal Commissioner (KMC/DMC)	Operational
<b><u>Environmental Impacts due to Improper Maintenance of Roads, Pedestrian Walkways and Bicycle Paths</u></b> Traffic congestion, air pollution, enhanced city's carbon footprint	<b><u>Maintenance of Roads, Pedestrian Walkways and Bicycle Paths</u></b> LCs staff will maintain these roads, pedestrian walkways and bicycle paths throughout project life to improve urban air quality.	KMC/DMCs	Operational stage
<b><u>Disturbance to the Aesthetic of the Area</u></b> Drains and road sites disturb the aesthetic of the areas	<b><u>Landscaping to Improve Aesthetic of the Sites</u></b> The aesthetic of the sites such as storm water drains and municipal roads will be improved by landscaping. The green spaces will be developed at these sites to create their positive image among nearby community.	KMC/DMCs	Operational stage

## **7.8 Monitoring Framework**

Monitoring of the Mitigation Plan (MP) is required at construction and operational phases of the project components. The monitoring is requisite for World Bank and Sindh Environmental Protection Agency (SEPA). The monitoring framework is illustrated in Figure 9.

### **7.8.1 Construction Phase Monitoring**

Construction phase monitoring of the project components will be required for the compliance of ESMP mentioned in the Environmental Assessment (EA) for World Bank and SEPA, respectively.

#### **a) Project Management Unit**

The overall responsibility of compliance of MP and compliance reporting to World Bank and SEPA will be with KMC/DMCs. The Project Management Unit (PMU), established for the management of CLICK project activities, will overall supervise the monitoring and compliance of MP.

#### **b) Environmental and Social Cell (ESC)**

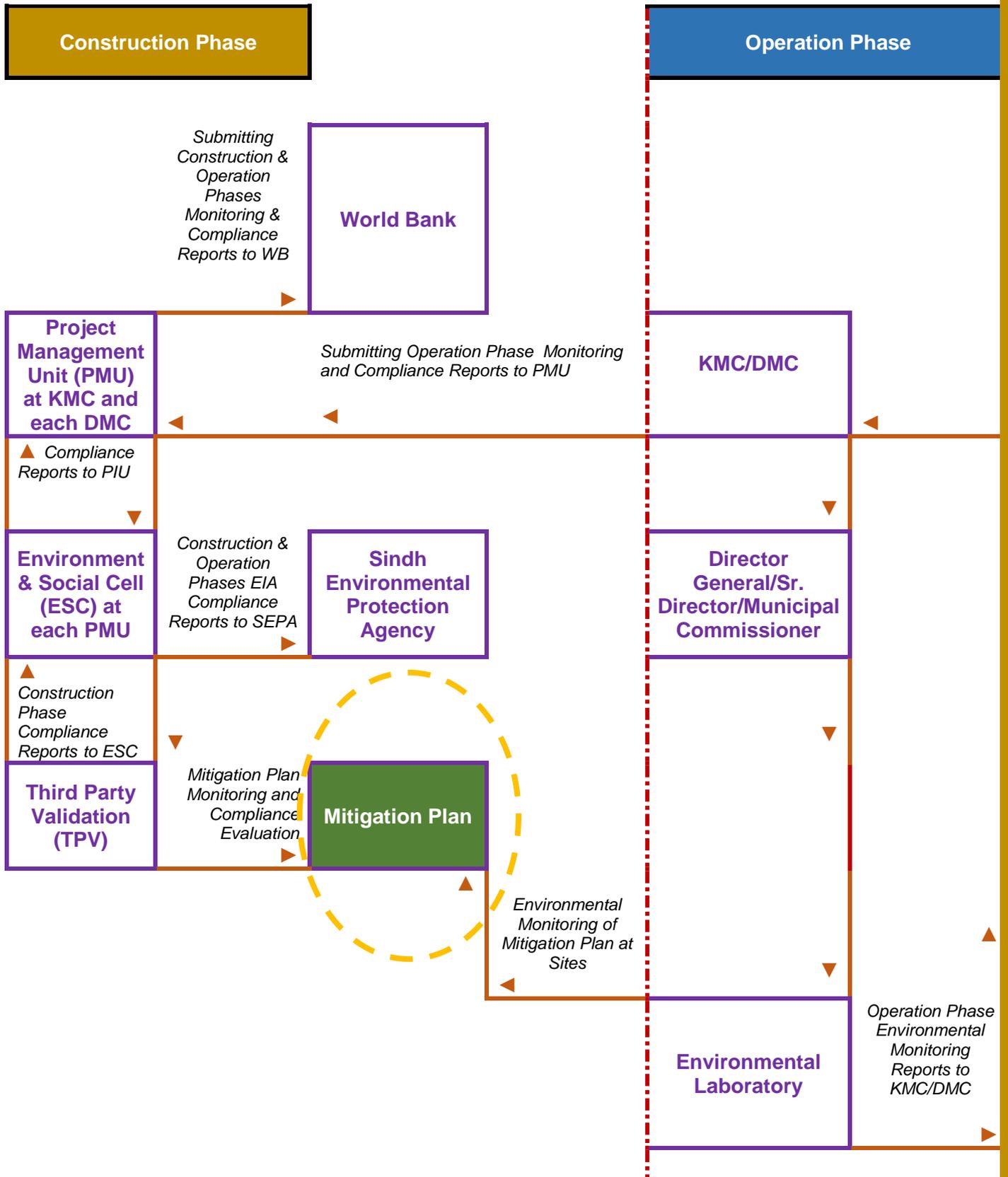
The Environment and Social Cell (ESC) under PMU will overall take care of environmental and social aspects of the project activities. ESC will arrange environmental monitoring and prepare compliance reports and submit to PMU for further submitting to the World Bank and SEPA to fulfill their monitoring, reporting, and compliance requirements of environmental safeguard.

The Construction Phase Environmental and Social Management Plan (ESMP) will be prepared and appended with the tender document for the contractors. It will be a standard document. The contractors will be required to prepare their own site specific ESMPs. These ESMPs will contain following plans to eliminate, offset or reduce environmental, health and safety impacts during construction phase:

- Sanitation plan
- Soil pollution control plan
- Dust control plan
- Waste management plan
- Health and safety plan
- Noise abatement plan
- Traffic management plan
- Campsite restoration plan
- Tree plantation plan

The compliance of ESMP will be the responsibility of the contractor and compliance cost will be added in the bidding documents. The ESC will be the responsibility to ensure compliance of ESMP during construction phase through contractors. The compliance would require measurements of environmental parameters and observations at the construction sites to evaluate compliance. The ESC will hire the services of independent environmental consultancy firm as Third Party for Third Party Validation (TPV).

Figure 9: Monitoring Framework



### **c) Third Party Validation**

The Third Party Validation will be carried out through independent consultancy firm. The consultant firm will monitor the environmental and social parameters and conduct field surveys at the construction sites to evaluate compliance level by the contractors. The consultant firm will prepare monthly monitoring and evaluation report for each site and submit to ESC. The ESC will review the report, discuss with the consultant firm and finalize the findings. In case of noncompliance from the contractors, the ESC will have the authority to halt the construction activities or impose penalties as per the contract conditions. The ESC will submit the final version of monitoring and evaluation reports to PMU. PMU will submit these reports to the World Bank for their review and further action. These reports will also be submitted to SEPA as per the frequency to be mentioned in the construction phase 'No Objection Certificate (NOC)' requirements (Quarterly and yearly).

## **7.8.2 Operational Phase Monitoring**

The overall responsibility of compliance of operational phase MP will be with KMC and respective DMCs.

### **a) Karachi Metropolitan Corporation (KMC)**

In the organizational hierarchy of KMC, Director General (Technical Services) and Senior Director (Municipal Services) under Municipal Commissioner, will be overall responsible for the operation and maintenance of storm water drainage system and flood control system of the Karachi city.

The monitoring and compliance of operational phase MP will be under the responsibilities of Director General and Senior Director. These personnel will report to the Municipal Commissioner for the compliance and monitoring of MP.

### **b) District Municipal Corporation (DMC)**

In the organizational hierarchy of each DMC, Municipal Commissioner under District Chairman will be overall responsible for the operation and maintenance of municipal roads, parks, storm water drainage system and solid waste management.

The monitoring and compliance of operational phase MP will be under the responsibility of Municipal Commissioner. He/she will report to the District Chairman for the compliance and monitoring of MP.

### **c) Environmental Laboratory**

The Director General, Senior Director and Municipal Commissioner of KMC and DMC will have the leverage to hire the services of competent environmental laboratory to monitor environmental parameters at project sites. The compliance reports will be submitted by the Director General and Senior Director of KMC and Municipal Commissioner of each district to Municipal Commissioner and District Chairman respectively at set frequency (fortnightly). The laboratory reports will be the part of these compliance reports.

The respective Director General, Senior Director and Municipal Commissioner of each district will take corrective actions and preventive measures in case of any nonconformity against the MP. These corrective and preventive measures and rectification will also be the part of the compliance reports.

The Municipal Commissioner of KMC and District Chairman of each district will submit the operational phase MP compliance reports to PMU for further submission to the World Bank.

The monitoring plan is presented in Table 14.

Table 11: Mitigation Plan Monitoring

<b>Subproject (s):</b> <i>Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations</i>			
<b>Mitigation Measure</b>	<b>Monitoring Responsibility</b>	<b>Monitoring Parameters</b>	<b>Frequency</b>
<b>Construction Phase</b>			
Restoration of the Construction Sites Tree Plantation	Environmental Consultancy Firm	<b>Evaluation for</b> i) Proper stockpiling of topsoil ii) proper application of topsoil iii) tree plantation as per Tree Plantation Plan	Fortnightly at each site
Protection of Natural Habitats	Environmental Consultancy Firm	<b>Evaluation for</b> i) Fencing of the sensitive resources ii) construction activities restricted to about 15 m of the resources iii) construction activities whether occurring during prime nesting season or not iv) if construction will be carried out, it will be at about 75 m from the forested area to avoid disturbing nesting habitats v) the placement of visual and acoustic barriers at the vicinity of nesting habitats.	-do-
Protection of Physical Cultural Resources (PCRs)	Environmental Consultancy Firm	<b>Evaluation for</b> i) the care taken by the contractor for the protection of PCRs (identification, protection measures taken, reporting etc.)	-do-
Suppression of Dust Emission	Environmental Consultancy Firm	<b>Evaluation for</b> i) regular water sprinkling at dust generation points at construction sites and vehicular and machineries routes ii) use of dust masks, gloves, shoes, apron by the workers iii) fitness certificates/maintenance records of vehicles/machines	Weekly at each site
Control of Stack and Vehicular Emissions		<b>Monitoring for</b> i) TSPM, PM <sub>10</sub> , PM <sub>2.5</sub> at construction sites, vehicular routes, nearby community ii) stack monitoring of generators (CO, NO <sub>x</sub> , SO <sub>x</sub> iii) vehicular emissions (CO, NO <sub>x</sub> , SO <sub>x</sub> , Lead)	
Wastewater Treatment	Environmental Consultancy Firm	<b>Evaluation for</b> i) proper treatment and disposal of sanitary wastewater from campsites i.e. construction of septic tanks and disposal in the nearby drain through sewers <b>Monitoring for</b> i) wastewater characteristics i.e. pH, BOD <sub>5</sub> , COD, TSS, TDS	Weekly at each site
Solid Waste Management Hazardous Solid Waste Management	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of waste management plan ii) compliance of hazardous solid waste management plan iii) training of the workers iv) use of PPE during handling of hazardous solid waste	Weekly at each site
Soil Pollution Control	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of soil pollution control plan ii) availability of spill kit iii) spill response procedures iv) training of the workers	Weekly at each site
Noise Abatement	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of noise abatement plan ii) use of ear plugs/ear muffs by the workers iii) enclosures for the noisy equipment iv) erection of noise barriers at appropriate places v) equipment are fitted for silencers/mufflers v) fitness certificates/maintenance records of vehicles/machines vi) noise complaints records <b>Monitoring for</b> i) Noise levels (dBA) at construction sites ii) vehicular noise at about 7.5 m distance iii) noise levels at nearby community/forests	Weekly at each site Noise monitoring after every two hours at each location (8:00 am to 6:00 pm)

**Subproject (s):** *Repair and rehabilitation of drains and flood control system, , Repair and rehabilitation of roads and streets, , Pedestrian walkways, bicycle paths, pedestrian bridges and crossings, parks, playground, public spaces etc., , Rehabilitation of primary health facilities and schools, public toilets, and rehabilitation of fire stations*

Mitigation Measure	Monitoring Responsibility	Monitoring Parameters	Frequency
Occupational Health and Safety Management	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of health and safety plan ii) availability and use of PPEs by the workers iii) accident records iv) availability of First Aid Boxes and trained staff for first aid v) medical facilities vi) safety measures at sites taken while working and operating machines vii) availability and use of fire control equipment viii) training of the staff ix) maintenance of hygiene conditions x) availability of safe drinking water. <b>Monitoring for</b> i) drinking water quality	Weekly at each site
Traffic Management	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of traffic management plan during construction	Weekly at each site
Campsites Restoration	Environmental Consultancy Firm	<b>Evaluation for</b> i) compliance of campsite restoration plan ii) pre and post scenario of the campsites	Pre and post construction activities at each site
Protection of Underground Utilities Lines	Environmental Consultancy Firm	<b>Evaluation for</b> i) contractor's consultation with utility companies, ii) care taken to avoid underground utilities during excavation, iii) contractor promptly informed the respective utility company, in case of any underground utility lines damage	
<b>Operational Phase</b>			
Maintenance of Storm Water Drainage System	Director General Tech./Sr. Director/Municipal Commissioner (KMC/DMC)	<b>Evaluation for</b> i) compliance of Standard Operating Procedures (SOPs) ii) compliance of preventive maintenance schedule iii) records of complaints and their rectification iv) maintenance activities v) availability and condition of equipment for storm water drainage system upkeep vi) conditions of the equipment vii) training of the staff	Daily
Landscaping to Improve Aesthetic of the Sites	Director General Tech./Sr. Director/Municipal Commissioner (KMC/DMC)	<b>Evaluation for</b> i) maintenance of landscaping as per requirements	Daily
Maintenance of Roads, Pedestrian Walkways and Bicycle Paths	Director General Tech./Sr. Director/Municipal Commissioner (KMC/DMC)	<b>Evaluation for</b> i) maintenance of roads, pedestrian walkways and bicycle paths	Quarterly

## 7.9 Capacity Building

Capacity building is required for the stakeholders involved for the implementation, supervision, monitoring, evaluation, and reporting of the mitigation measures during construction and operational phases of the project components. This section describes the capacity building requirements for the stakeholders involved.

Following are the key stakeholders involved for the accomplishment of the environmental safeguard requirements of the CLICK project:

- KMC Director General (Technical Services)- KMC DGT
- KMC Sr. Director (Municipal Services)- KMC DM
- DMCs Municipal Commissioners- DMC MC
- Environment and Social Cell (ESC)
- Environmental Consultancy Firm (ECF)
- Environmental Laboratory (EL)
- Contractors (CONTs)

Table 15 presents detail of trainings required for the capacity building of above mentioned key stakeholders on environmental safeguard requirements.

Table 12: Training Requirements

#	Trainings (Resource Person)	Key Stakeholders (Frequency)						
		KMC DGT	KMC DM	DMC MC	ESC	ECF	EL	CONTs
1	Overview of Project and Subprojects and their Environmental Impacts and Mitigation Measures <i>(Environmentalist)</i>	■	■	■	■	■		■
		Once at the start						Once for Every Contractor
2	Construction Phase Environmental Management Plan (CPEMP) <i>(Environmentalist)</i>	■	■	■	■	■		■
		Once at the start						Once for Every Contractor
3	Environmental Monitoring and Evaluation Requirements during Construction and Operational Phases <i>(Environmentalist)</i>	■	■	■	■	■	■	
		Once at the start						
4	Environmental Assessment of the Projects <i>Environmentalist/EIA Expert</i>				■			
					Once at start			
5	Environmental Monitoring, Evaluation and Compliance Reporting Requirements <i>(Environmental Safeguard Specialist)</i>	■	■	■	■	■		
		Once at the start						
6	Public Consultation, Disclosure and Grievance Redress Mechanism Requirements <i>(Environmental Safeguard Specialist)</i>	■	■	■	■			
		Once at the start						

## 8.0 GRIEVANCE REDRESS MECHANISM

This chapter describes the Grievance Redress Mechanism will be adopted by the LCs to facilitate resolution of any community complaints and grievances about the project's environmental performance, in line with the requirements of World Bank.

### 8.1 Requirements of Grievance Redress Mechanism (GRM)

LCs will respond to concerns and grievances of project affected parties related to the environmental and social performance of the project in a timely manner. For this purpose, LCs will propose and implement a grievance redress mechanism (GRM) to receive and facilitate resolution of such concerns and grievances. The GRM will be proportionate to the potential risks and impacts of the project and will be accessible and inclusive. Where feasible and suitable for the project, the GRM will utilize existing formal or informal GRM, supplemented as needed with project specific arrangements.

- a) The GRM is expected to address concerns promptly and effectively, in a transparent manner that is culturally appropriate and readily accessible to all project-affected parties, at no cost and without retribution. The mechanism, process or procedure will not prevent access to judicial or administrative remedies. LCs will inform the project-affected parties about the grievance process in the course of its community engagement activities, and will make publicly available a record documenting the responses to all grievances received; and
- b) Handling of grievances will be done in a culturally appropriate manner and be discreet, objective, sensitive and responsive to the needs and concerns of the project-affected parties. The mechanism will also allow for anonymous complaints to be raised and addressed.

### 8.2 Grievance Redress Mechanism for CLICK

The LCs will establish a Grievance Redress Mechanism (GRM) to facilitate the resolution of community complaints and grievances about the project's environmental and social performance. This shall be in line with the requirements of the World Bank. Under this mechanism, a Grievance Redress Cell (GRC) will be established in the Project Implementation Unit. One focal person will be designated for GRM at each construction site during construction phase. This person will be directly accessible to the community for the registration of complaints and their resolution.

The established GRM will be communicated to the public and particularly the affected communities through print and electronic media and during public consultations and community engagement events.

This cell will maintain a Community Complaints Management Register (CCMR), at the site, for registering complaints and grievances. All written and oral grievances will be recorded in the Register. The information will include the date and the particulars of the complainant; a description of the grievance; the follow-up action required; the person responsible for implementing the action; and a target date for its completion. Each complaint will be recorded in the register with a complaint number and provided to the affected person for follow up purpose. GRC designated person will take necessary actions as per the nature, scale and type of the grievance registered. He or she can halt the construction activities in case the contractors do not comply with the CPEMP and causing grievances to the nearby community.

For operational phase GRM, the Director General (Technical Services) and Sr. Director (Municipal Services) of KMC and respective Municipal Commissioner of DMC will be responsible for

maintaining community complaints in the CCMR and their resolution. They can also get the assistance of other team members of KMC/DMC and PMU for the resolution of the complaints.

Android based GRM Application (GRM App) will also be established, launched and publicized to make GRM effective, easy and accessible to everybody. This App will be designed in a very user friendly simple format to lodge a complaint. After receiving the complaint, complaint number will be sent to the applicant immediately. He or she will be contacted, if required. He or she will be informed as soon as his/her complaint is resolved or time to time updated for the progress of the complaint. This App will be maintained by GRC. All the records of GRM will be accessible to the public and the World Bank. A monthly Grievance Redress Report (GRR) will be prepared and be part of the compliance reports.

### **8.3 World Bank's Grievance Redress Service (GRS)**

Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), web link (<http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>) can be used.

## 9 BUDGET

This chapter describes the tentative budget for the environmental assessment and compliance of mitigation plan during construction and operational phases of the project and subprojects.

### 9.1 Tentative Budget

The tentative budget under different cost head is mentioned in Table 16. Total tentative budget for the compliance of environmental safeguard requirements is about Rs. 91.91 million.

Table 13: Tentative Budget for Environmental Assessment and Compliance

All Costs are in Pak Rupee (PKR)

#	Cost Head	Unit Cost	No. of Units	Total Amount
<b>A- Environmental Assessment (ESMPs)</b>				
1	Repair & rehabilitation of drains and flood control system under DMCs	500,000	1	500,000
2	Repair and rehabilitation of roads	500,000	1	500,000
3	Repair & rehabilitation of drains and flood control system under KMC	1,000,000	1	1,000,000
<b>Total-A</b>				<b>2,000,000</b>
<b>B- Construction Phase ESMP Implementation</b>				
4	Fixed cost per project (fire safety equipment, septic tanks, installation of noise barriers, and environmental monitoring equipment)	785,000	6	4,710,000
5	Monthly operational cost (PPEs, first aid, solid waste management, water sprinkling, traffic management, restoration of campsites etc.)	575,000	48	27,600,000
<b>Total-B</b>				<b>32,310,000</b>
<b>C-Operational Phase ESMP Implementation</b>				
6	Fixed cost per project	200,000	3	600,000
7	Monthly operational cost (For One Year)	500,000	12	6,000,000
<b>Total-C</b>				<b>6,600,000</b>
<b>D-Training</b>				
8	Training cost (EMF) for 6 trainings	500,000	6	3,000,000
<b>Total-D</b>				<b>3,000,000</b>
<b>E- Third Party Validation Cost</b>				
9	Third party validation cost (For One Year)	2,000,000	12	24,000,000
<b>Total-E</b>				<b>24,000,000</b>
<b>F- Operation of Environment &amp; Social Cell</b>				
10	Environment and Social Cell Cost (For One Year) (Salary of Environmental Engineer, Junior Environmental Engineers, Junior Environmental Scientists at KMC and 6 Districts and operational expenses of the cell)	2,000,000	12	24,000,000
<b>Total-F</b>				<b>24,000,000</b>
<b>Grand Total</b>				<b>91,910,000</b>

## ANNEXURE-1

### PROCEEDINGS

A stakeholder consultation workshop was organized on April 3, 2019 at Local Government Department office, Karachi. The objective of the workshop was to disseminate draft version of Environmental and Social Management Framework (ESMF) of the 'Competitive and Livable City of Karachi (CLICK)' to the stakeholders and get their feedback. The draft ESMF will be finalized in the light of stakeholders' feedback, suggestions and their concerns. This consultation is required by World Bank as per its stakeholder consultation and disclosure policy.

About 20 participants attended the workshop. They were the representatives of DMCs, KMC, NED University, Local Government Departments, Sindh Solid Waste Management Board (SSWMB), and consultants.

Mr. Faheem Junejo of Local Government Department started the proceedings, welcomed all the participants, explained the objective of the consultation workshop and briefly described the subject project. After brief introduction of the project, Environmental Consultant, presented the Environmental Management Framework (EMF). After EMF presentation, Social Consultant, presented the Social Management Framework (SMF).

After the presentation session, participants were requested to pose questions regarding both the frameworks presented. Following are the key questions and their answers regarding EMF.

**Q:** What type of the subprojects will be under the project and their location?

**A:** At this stage, the type of subprojects and their locations are not finalized. These will be finalized later on after discussion with all the DMCs.

**Q:** LCs should learn from the similar World Bank's ongoing infrastructure project (Karachi Neighborhood Improvement Project-KNIP)

**A:** Definitely, the infrastructure subprojects under CLICK will be designed in the light of the lessons learnt from all the similar projects.

**Q:** Will roads be rehabilitated after the completion of sewerage subprojects? Mostly we have observed that roads remain unattended after the rehabilitation work and cause problem to the community.

**A:** Road renovation/rehabilitation will be the part of CLICK. Grievance Redress Mechanism, established under the project will also resolve concerns of the community regarding all such issues.

**Q:** Will CLICK only consider rehabilitation of the roads or any bridge, flyover, underpasses etc. be constructed along the road rehabilitation to improve the traffic flow in the city?

**A:** Mostly CLICK will address the roads repair and rehabilitation projects. However, if need arises for such infrastructures, then it can also be considered.

**Q:** Will incinerators be constructed in the primary health facilities?

**A:** There will be only subprojects for the rehabilitation of the primary health facilities. Construction of incineration facilities will not be under project scope.

**Q:** What is the duration and budget of the project?

**A:** The duration of the project is 6 year and budget is US\$ 230 million.

**Q:** The World Bank's maximum limit of 200 affected persons for category B projects seems very strict for a large city of Karachi.

**A:** There will be only rehabilitation projects, not large scale infrastructure projects under CLICK. The rehabilitation subprojects will not involve large number of peoples to be displaced or affected.



SCREENING QUESTIONS	Yes	No	Impact Severity Ranking				REMARKS
			NR	1	2	3	
➤ Buffer zone of protected area	<input type="checkbox"/>						
➤ Special area for protecting biodiversity	<input type="checkbox"/>						
➤ Forest	<input type="checkbox"/>						
➤ Bay	<input type="checkbox"/>						
<b>B. Potential Environmental Impacts (Construction Phase)</b>							
▪ Will construction camp site cause land clearing and tree cutting?	<input type="checkbox"/>						
▪ Will construction camp site interfere with the community?	<input type="checkbox"/>						
▪ Will construction camp site cause soil pollution?	<input type="checkbox"/>						
▪ Will construction camp generate domestic solid waste?	<input type="checkbox"/>						
▪ Will construction camp generate hazardous solid waste?	<input type="checkbox"/>						
▪ Will construction camp generate sanitary wastewater?	<input type="checkbox"/>						
▪ Will fire be a potential safety hazard at construction camp?	<input type="checkbox"/>						
▪ Will construction camp activities cause air pollution?	<input type="checkbox"/>						

SCREENING QUESTIONS	Yes	No	Impact Severity Ranking				REMARKS
			NR	1	2	3	
▪ Will construction camp activities cause noise?	<input type="checkbox"/>						
▪ Will construction activities require tree cutting?	<input type="checkbox"/>						
▪ Will construction activities result in damaging existing local roads, bridges or other infrastructure?	<input type="checkbox"/>						
▪ Will construction activities involve use of explosives and chemicals?	<input type="checkbox"/>						
▪ Will construction activities disturb natural habitats?	<input type="checkbox"/>						
▪ Will construction activities result in impairment of historical/cultural monuments/areas and loss/damage to these sites?	<input type="checkbox"/>						
▪ Will construction activities generate noise?	<input type="checkbox"/>						
▪ Will construction activities generate dust?	<input type="checkbox"/>						
▪ Will construction activities cause air pollution due to stack emissions from generators, construction machines and vehicles?	<input type="checkbox"/>						
▪ Will construction activities generate asphalt emissions?	<input type="checkbox"/>						

SCREENING QUESTIONS	Yes	No	Impact Severity Ranking				REMARKS
			NR	1	2	3	
▪ Will construction activities cause soil pollution?	<input type="checkbox"/>						
▪ Will construction activities generate construction debris?	<input type="checkbox"/>						
▪ Will construction activities generate hazardous solid waste?	<input type="checkbox"/>						
▪ Will construction take place near to water bodies?	<input type="checkbox"/>						
▪ Will construction activities cause contamination of the surface water resources?	<input type="checkbox"/>						
▪ Will construction activities take place near wastewater/storm water drains?	<input type="checkbox"/>						
▪ Will construction activities result in damaging the utilities at site?	<input type="checkbox"/>						
▪ Will construction activities require utilities relocation?	<input type="checkbox"/>						
▪ Will construction activities involve excavation?	<input type="checkbox"/>						
▪ Will construction involve heavy machinery?	<input type="checkbox"/>						
▪ Will construction activities increase road traffic at site?	<input type="checkbox"/>						

SCREENING QUESTIONS	Yes	No	Impact Severity Ranking				REMARKS
			NR	1	2	3	
▪ Will construction activities cause traffic congestion/diversion?	<input type="checkbox"/>						
▪ Will construction activities cause mobility and accessibility issue for the residents?	<input type="checkbox"/>						
▪ Will construction activities/machines be the safety hazards for the workers?	<input type="checkbox"/>						
▪ Will construction activities be the safety hazards for community?	<input type="checkbox"/>						
<b>C. Potential Environmental Impacts (Operational Phase)</b>							
▪ Leakages in the drains	<input type="checkbox"/>						
▪ Damaging of drains	<input type="checkbox"/>						
▪ Clogging and overflowing of wastewater from the drains	<input type="checkbox"/>						
▪ Chances of contamination water supply	<input type="checkbox"/>						
▪ Flooding at roads	<input type="checkbox"/>						
▪ Type of lightings in the infrastructure	<input type="checkbox"/>						

SCREENING QUESTIONS	Yes	No	Impact Severity Ranking				REMARKS
			NR	1	2	3	
<ul style="list-style-type: none"> <li>Inadequate protection of intake works or wells, leading to pollution of water supply?</li> </ul>	<input type="checkbox"/>						

NR *Not Relevant*

1 *No or Minor Impact*

2 *Moderate, Short Term, Reversible Impact*

3 *Severe, Long Term, Irreversible Impact*

Category	A	B	C
<b>Environmental Management Required</b>	NO	YES	
<b>Type of Environmental Management Tool to be Used</b>	ESMPs		
<b>Prior review and “no-objection” of World Bank required.</b>	YES		

## REFERENCES

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