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Report No: PAD3678

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF US$100 MILLION

TO THE

ISLAMIC REPUBLIC OF PAKISTAN

FOR A

SOLID WASTE EMERGENCY AND EFFICIENCY PROJECT (SWEEP)

November 11, 2020

Urban, Resilience and Land Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2020)

Currency Unit =	Pakistan Rupee
PKR 165.55 =	US$1

FISCAL YEAR
July 1 - June 30

Regional Vice President:	Hartwig Schafer
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ABBREVIATIONS AND ACRONYMS

ADP	Annual Development Plan
AGP	Auditor General of Pakistan
CLICK	Competitive and Livable City of Karachi
C&D	Construction and Demolition
CPS	Country Partnership Strategy
DA	Designated Account
DMC	District Municipal Corporation
DSSI	Debt Service Suspension Initiative
E&S	Environmental and Social
EHS	Environmental Health and Safety
ESCP	Environmental and Social Commitment Plan
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FM	Financial Management
GBV	Gender-based Violence
GHG	Greenhouse Gas
GoS	Government of Sindh
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
IFC	International Finance Corporation
IBRD	International Bank for Reconstruction and Development
IMF	International Monetary Fund
IPSAS	International Public Sector Accounting Standards
IUFR	Interim Unaudited Financial Report
KNIP	Karachi Neighborhood Improvement Project
KMC	Karachi Metropolitan Corporation
LC	Local Council
LFG	Landfill Gas
LGD	Local Government Department
M&E	Monitoring and Evaluation
MIGA	Multilateral Investment Guarantee Agency
MSME	Micro, Small, and Medium Enterprises
NGO	Non-governmental Organization
O&M	Operations and Maintenance
PD	Project Director
PDO	Project Development Objective
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
PPP	Public–Private Partnership
RP	Resettlement Plan
SCD	Systematic Country Diagnostic

SDG	Sustainable Development Goals
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SPC	Shadow Price of Carbon
SWEEP	Solid Waste Emergency and Efficiency Project
SWM	Solid Waste Management
SSWMB	Sindh Solid Waste Management Board
TA	Technical Assistance
WB	World Bank
WBG	World Bank Group

TABLE OF CONTENTS

DATASHEET

BASIC INFORMATION

Country(ies)	Project Name		
Pakistan	Solid Waste Emergency and Efficiency Project		
Project ID	**Financing Instrument**	**Environmental and Social Risk Classification**	**Process**
P173021	Investment Project Financing	High	Urgent Need or Capacity Constraints (FCC)

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[✓] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
08-Dec-2020	30-Jun-2025

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To mitigate the impacts of flooding and COVID-19 emergencies, and to improve solid waste management services in Karachi.

Components

Component Name	Cost (US$, millions)
Immediate Emergency Response Interventions	11.00
Development of SWM Backbone Infrastructure	84.00
Project Management and Implementation Support	10.00

Organizations

Borrower:	Islamic Republic of Pakistan
Implementing Agency:	Province of Sindh Local Government Department

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	105.00
Total Financing	105.00
of which IBRD/IDA	100.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	100.00

Non-World Bank Group Financing

Counterpart Funding	5.00
Borrower/Recipient	5.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2020	2021	2022	2023	2024	2025
Annual	0.00	15.00	15.00	20.00	30.00	20.00

Cumulative	0.00	15.00	30.00	50.00	80.00	100.00

INSTITUTIONAL DATA

Practice Area (Lead)

Urban, Resilience and Land

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environment and Social	High
8. Stakeholders	Substantial
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description
PIU and staffing: PA, Section I.A.1 of the Schedule: Establishment of a PIU under SSWMB within 2 months of Effectiveness; Recruitment of a project director, procurement specialist and financial management specialist officer in each PMU - within 2 months of Effectiveness; and, Recruitment of consultants, advisors, and technical experts.

Sections and Description
Steering Committee: PA, Section I.A.2 of the Schedule: Establishment of Project Steering Committee with attribution and composition acceptable to the Bank - within 2 months of Effectiveness, till Project completion.

Sections and Description

Operations Manual: PA, Section I.B.1 of the Schedule: Project Implementing Entity, through SSWMB, to adopt within 2 months of Effectiveness and thereafter implement, an Operations Manual satisfactory to the Bank.

Sections and Description

Environmental and Social Standards: PA, Section I.C.1 of the Schedule: Project Implementing Entity shall ensure that the Project is carried out in accordance with the Environmental and Social Standards, in a manner acceptable to the Bank.

Sections and Description

Environmental and Social Commitment Plan (ESCP): PA, Section I.C.2 of the Schedule: Project Implementing Entity shall ensure that the Project is implemented in accordance with the ESCP, in a manner acceptable to the Bank, including: (a) the measures and actions specified in the ESCP are implemented with due diligence and efficiency; (b) sufficient funds are available to cover costs of implementing the ESCP; (c) policies and procedures are maintained, and qualified and experienced staff in adequate numbers are retained to implement the ESCP; and, (d) the ESCP, or any provision thereof, is not amended, repealed, suspended or waived, unless agreed with the Bank and disclosed promptly thereafter.

Sections and Description

Safeguards Monitoring and Reporting: PA, Section I.C.4 of the Schedule: Project Implementing Entity shall collect, compile, and furnish to the Bank through regular reports, and in separate report(s) if requested by the Bank, information on compliance with the ESCP and the environmental and social instruments, including: (i) the status of implementation of the ESCP; (ii) any conditions which interfere or threaten to interfere with the implementation of the ESCP; (iii) corrective and preventive measures taken or required to be taken to address such conditions; and (iv) any incident or accident related to or having an impact on the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers, in accordance with the ESCP, the environmental and social instruments referenced therein and the Environmental and Social Standards.

Sections and Description

Progress Monitoring, Reporting and Evaluation: PA, Section I.D of the Schedule: Project Implementing Entity shall monitor and evaluate the progress of the Project and prepare Project Reports based on indicators acceptable to the Bank. Each Project Report shall cover the period of one calendar semester.

Conditions

I. STRATEGIC CONTEXT

A. Country Context

1. **Pakistan is at a crossroads as it deals with the coronavirus disease (COVID-19) pandemic.** Periodic macroeconomic crises and a low human capital basis have constrained the country's growth prospects. Over the last two decades, economic growth in Pakistan has averaged 4.4 percent a year, below the South Asian annual average of 6.3 percent. Low investment in human capital, slow progress of structural reforms, low private investment, and slow export growth due to an overvalued currency, among others, have hindered growth prospects. The country was making good progress in stabilizing its economy and implementing much needed structural reforms. However, the COVID-19 pandemic has had significant negative impacts on the economy. Real GDP growth (at factor cost) is estimated to have declined from 1.9 percent in FY2019 to -1.5 percent in FY20, the first contraction in decades, reflecting the effects of COVID-19 containment measures that followed monetary and fiscal tightening prior to the outbreak. Due to significant uncertainty over the evolution of the pandemic, demand compression measures to curb imbalances, along with unfavorable external conditions, Pakistan's near-term economic prospects are subdued. Economic growth is projected to remain below potential, averaging 1.3 percent for FY2021-22.

2. **In response to the outbreak of COVID-19 in Pakistan, the government announced a fiscal stimulus package of approximately US$7.5 billion[1] (equivalent to 2.6 percent of GDP).** This was aimed to (a) support the medical health sector in combatting the spread of the virus and providing relief to those affected; (b) implement social welfare measures to support the poor and vulnerable whose livelihoods have been affected by the economic slowdown and partial lockdowns across the country; and (c) provide stimulus to businesses and industries to protect productive assets during the economic downturn. The financing of the response package comprised approximately US$2.5 billion of additional resources, and a re-appropriation from the existing budget. Pakistan also availed of the Debt Service Suspension Initiative (DSSI) and expects US$1.8 billion to US$2.4 billion in temporary fiscal space[2] due to the debt service standstill during the period May 1 to December 31, 2020 from bilateral creditors, including the G20 and its extension through 2021. The country has committed to use the created fiscal space for additional social, health or economic spending and follow the disclosure and other requirements of the DSSI.

3. **Pakistan is the most urbanized large country in South Asia,[3] but cities and towns are struggling to manage solid waste.** According to a 2017 estimate, Pakistan produced around 31 million metric tons of solid waste annually.[4] Insufficient public spending on essential infrastructure, weak institutions, and low professionalization and skillsets within the sector constrain the adequate management of waste, leading to reduced livability, environmental degradation, and high incidence of marine and plastic pollution. Waste collection remains low across the country and the waste collected is generally disposed in uncontrolled dumps.

4. **Pakistan currently ranks fifth among countries most vulnerable to climate change,[5] and is prone to extreme weather events, particularly heavy rainfall and subsequent flooding during the monsoon season**. The country suffered US$18 billion in losses due to flooding between 2005 and 2014, equivalent to around 6 percent of the federal budget.[6] The number of heavy rainfall events in Pakistan has increased since 1960, and the nine heaviest rains over 24 hours were

[1] Estimated USD equivalent for PKR 1.2 trillion stimulus package.

[2] This includes non-G20 creditors. Specific amount will be determined after data reconciliation has been completed.

[3] Officially, about 36 percent of Pakistanis live in urban settlements. A large body of research indicates that actual urbanization may be higher, as issues with definition and boundaries in official statistics tend to under report the share of Pakistan's urban population.

[4] Korai, Muhammad Safar, Rasool Bux Mahar, and Muhammad Aslam Uqaili. 2017. "The Feasibility of Municipal Solid Waste for Energy Generation and its Existing Management Practices in Pakistan." *Renewable and Sustainable Energy Reviews* 72: 338–53.

[5] Germanwatch, 2019. Global Climate Change Risk Index 2020: Who suffers most from extreme weather events? Weather related loss events from 1998 to 2018

[6] World Bank (2015), Fiscal Disaster Risk Assessment Options for Consideration: Pakistan.

recorded in 2010.[7] As climate change intensifies, precipitation is projected to increase in summer and reduce in winter in Karachi, adding to volatility in seasonal precipitation. The erratic monsoon this year is a strong predictor of likely climate shifts, as the city received 484 millimeters of rain, the highest in at least 90 years. Along with rapid population growth and urbanization, hydrometeorological hazards have a disproportionate and growing impact on the urban poor.

B. Sectoral and Institutional Context

5. **Karachi generates an estimated 12,000 to 16,000 metric tons of municipal solid waste daily.**[8] Around 60 percent of this is collected and transported to two large unsanitary dumps, Jam Chakro and Gond Pass.[9] The chronic backlog of uncollected waste in Karachi impacts the operating capacity of urban infrastructure. The drainage system is often clogged by waste, which contributes to recurrent flooding and contaminated water sources. Environmental and human health impacts are severe: open burning of waste generates high levels of toxic chemicals that degrade air quality and cause cardio-vascular diseases; inadequate solid waste management (SWM) is also linked to persistent incidence of polio in Karachi;[10] and runoff of surface water contributes to groundwater pollution and the prevalence of water-borne diseases.

6. **Karachi ranks below low-income country benchmarks in SWM on all parameters.** Limited institutional capacity, a weak and fragmented governance structure and infrastructure gaps along the entire value chain impact the sector's efficiency. A diagnostic of the sector was completed in 2018,[11] and two ongoing urban sector operations are addressing some of the underpinning institutional and governance challenges.[12] Ongoing policy efforts are focusing on improving the overall institutional environment (e.g. capacity, analytics, planning) in which future infrastructure investments can succeed. The Government of Sindh (GoS) is cognizant of these problems and has taken several steps to improve the situation in recent years. In 2014, the GoS set up the Sindh Solid Waste Management Board (SSWMB) and has significantly increased budget allocations and expenditures to contract private sector firms for waste collection.

7. **Considering the debilitating impact of the 2019 monsoon rains in Karachi, flooding and public health risks are even higher this year.** Higher than average rainfall in the 2019 monsoon caused widespread flooding, inundated main transit corridors, residential areas and public spaces, damaged residential and commercial property, and caused 24 fatalities.[13] In October 2019, the GoS campaign 'Clean My Karachi' reportedly removed 1,000,000 metric tons of solid waste backlog; however, subsequent disruptions in public SWM services resulted in greater volumes of uncollected waste accumulating in drainage channels. Citing concerns with performance of the private sector operator, the SSWMB cancelled the waste collection contract for District West,[14] and was unable to secure adequate alternatives for this district. Since early March 2020, COVID-19 related restrictions for SWM operations across the city have compounded the problem by constraining SWM services, further increasing the backlog of uncollected waste.

8. **In addition, Sindh is managing the impacts of COVID-19 pandemic, as is the rest of the country.** Pakistan experienced a rapid surge in infections over May and June 2020, and Sindh has the largest number of confirmed COVID-19 cases among all provinces to date. Although the authorities have gradually eased some restrictions put in place since April, they continue to enforce highly localized "smart lockdowns" to mitigate against possible increases in infection.

9. **The GoS needs to address the underlying issues related to flooding in Karachi.** There are multiple issues that

[7] Climate Change Knowledge Portal, World Bank
[8] UN-ESCAP, UN-Habitat (2013), Baseline Study for Solid Waste Management – Karachi; Mahmood, M. (2019). History of solid w0aste management in Karachi.
[9] Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. 2018. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development Series. Washington, DC: World Bank. doi:10.1596/978-1-4648-1329-0. License: Creative Commons Attribution CC BY 3.0 IGO.
[10] Provincial Task Force for the eradication of polio.
[11] World Bank (2018), "Transforming Karachi into a Livable and Competitive Megacity: A City Diagnostic and Transformation Strategy"
[12] Karachi Neighborhood Improvement Project (KNIP, P161980), and Competitive and Livable City of Karachi (CLICK, P161402).
[13] An official death toll is not available. Unofficial reports place the number of deaths at roughly two dozen, primarily caused by collapsing buildings and electrocution.
[14] District West is the largest district in Karachi and also has the biggest concentrations of *'katchi abadies'* (low-income neighborhoods and informal settlements) in the city. The district is inhabited by around 25 percent of the city's population.

contribute to flooding in Karachi, which include, among others: insufficient drainage infrastructure (primary, secondary, and tertiary stormwater networks); reduced percolation due to paving and impermeabilization of surfaces; drains clogged by solid waste and/or by sewage; encroachment of natural drainage channels; inadequate land-use management and/or lack of enforcement of urban development, which have allowed the built up area to impinge on natural drainage systems without providing alternative conveyance capacity, etc. These result in reduced capacity of the drainage system to manage rainfall and leads to flooding. The cleaning of *nullahs*[15] represents an immediate risk mitigation activity to restore the capacity of the existing system that has been compromised due to solid waste linked issues. Preliminary analysis from flood risk modelling in Karachi shows that clearing *nullahs* ahead of the monsoon rains would reduce annual average damages by more than 30 percent.[16] In previous years, the practice of piling waste on channel banks or in residential areas for drying has proved inefficient and counterproductive, as it fell back into the drains or polluted adjacent residential areas. Flood mitigation in Karachi is therefore contingent on timely clearing of drains prior to the monsoon season and adequate logistical arrangements for the transfer and disposal of waste cleared from drains.

10. **Hazards from existing SWM practices in Karachi are set to further intensify due to the impacts of climate change.** The drainage infrastructure is being used for dumping solid waste in many areas of the city. Historical precipitation patterns show that this waste was partly flushed out of the drains with consistent rains especially during the monsoon season. Climate change is now affecting monsoon patterns with alternate wet and dry periods. This has direct implications for urban flooding in Karachi as drains will likely become clogged during prolonged dry periods and fail to perform during intense wet periods. The flooding during 2020 monsoon season in Karachi was a manifestation of this phenomena as the city received 10 times the average monthly precipitation in August 2020. Such erratic weather patterns are projected to become more frequent and intense in future. Hence there is a need for the cleaning of drains and adoption of sustainable SWM practices to reduce leakage of waste to ensure resilience from future climate impacts.

11. **A rapid intervention in the SWM sector also offers opportunities to address COVID-19 impacts on labor market and public health.** The proposed project activities to increase the conveyance capacity of the city's drainage system are labor intensive and require mobilization of crews to work throughout the monsoon season for cleaning and adequate disposal of waste. Primarily, the emergency *nullah* cleanup campaign and drainage maintenance will create employment opportunities and provide relief to low-skilled workers impacted by the economic ramifications from COVID-related lockdowns. Second, the project activities related to healthcare waste management can prevent potential spreading of COVID-19 from improper handling of contaminated waste. This includes strengthening existing medical waste management systems for collection and disposal, increasing awareness to the risks of exposure, training of personnel, and providing personal protective equipment (PPE) to workers.

The Bank's role in the Karachi SWM sector

12. **The Bank's ongoing urban policy dialogue in Karachi has long underscored the importance of effective SWM.** The Karachi City Diagnostic and Transformation Strategy identified the SWM sector as critical to improving livability and competitiveness. Integrated technical assistance (TA) interventions were prioritized under the Competitive and Livable City of Karachi (CLICK) Project, approved in 2019. Despite the need for capital investments and given the relative lack of maturity of the SWM sector, CLICK represents the first phase in building a long-term partnership between Karachi and the World Bank (WB), with the aim to address, systemic issues, including critical institutional, regulatory and capacity gaps. Initial activities were implemented through TA, and subsequent interventions in the SWM sector focus on infrastructure investments and improvements to the provision of SWM services of SWM. However, currently the performance of the SWM system is deteriorating, and recent shocks and emergencies linked to inadequate provision of

[15] *'Nullahs'*, or natural drainage streams, constitute the primary urban stormwater drainage system in Karachi, feeding into the Lyari and Malir rivers, or into the sea via Chinna or Korangi creeks.
[16] The analysis used a city-scale hydraulic model using satellite derived digital terrain information and data on urban built up area.

SWM services, public health risks and persistent economic impacts have increased the urgency for the Bank to scale up the engagement to help bridge the infrastructure and service provision gap in the sector.

13. **The proposed Solid Waste Emergency and Efficiency Project (SWEEP) has been designed at the request of the GoS**. First, SWEEP aims to reduce flood risk in Karachi and supports emergency response to the flood events during the 2020 monsoon season; it also helps efforts by the GoS to mitigate the health and economic impacts from COVID-19. Second, by leveraging the emergency response interventions, SWEEP will begin to tackle institutional and infrastructure changes required to upgrade SWM in Karachi. In view of widespread flooding during the 2019 monsoons and the resulting health crisis, and further deterioration of SWM services, the Bank approved the use of emergency procedures to prepare and implement SWEEP on November 14, 2019. The COVID-19 pandemic, high ex-ante flooding risks for the monsoon season in 2020, and unprecedented rains and heavy flooding in August 2020 also exacerbated the emergency.

14. **CLICK and SWEEP, will work in tandem to support essential institutional strengthening and infrastructure investments for improved SWM services in Karachi.** Specifically, CLICK supports upstream policy and regulatory reforms; strengthens institutional capacity of SSWMB; develops sector strategies; and builds public awareness. Building on these, SWEEP will begin incrementally upgrading infrastructure for collection, transfer, final disposal and treatment of waste.

C. Relevance to Higher Level Objectives

Impact of the COVID-19 Pandemic on the Country Program and Government Response

15. **Pakistan has been vulnerable to the impacts of the COVID-19 pandemic due to a weak and chronically underfunded public health system, concentrated poverty, and a weakening economy**. The COVID-19 pandemic and its containment measures have impacted the delivery of essential health services due to supply chain disruptions and redeployment of health care workers, while restrictions on movement, lost income and fear of infection have kept people away from primary health care facilities. There is likely to be a reversal in the decade-long trend of poverty reduction in Pakistan,[17] especially in urban areas where a third of the population lives. The pandemic also exacerbated macroeconomic and fiscal risks, with the closure of non-essential businesses and disruption to domestic supply chains significantly affecting manufacturing and services sectors that account for nearly 80 percent of GDP. Crisis-response expenditures and lower revenues are also contributing to increase the fiscal deficit to 9.4 percent from pre-COVID-19 estimate of 6.3 percent. The country's main industries—textiles and apparel—are highly exposed to disruptions from COVID-19 because of their labor-intensive nature. In FY2020, the economy is projected to contract between 2.6 and 3.3 percent, and between 0.2 and 4.0 percent in FY2021, which contrast with pre-COVID19 projections for growth that stood at 2.4 percent for FY2020 and 3.0 percent for FY2021. As described above, the government responded early with a fiscal stimulus package of around US$7.5 billion and availed the DSSI, creating additional space to support recovery.

16. **World Bank Group (WBG) engagement in Pakistan is guided by the Country Partnership Strategy (CPS) for fiscal years 2015–20**.[18] The CPS, now extended to FY2021, is built on four results areas: energy, private sector, inclusion, and service delivery. In response to the COVID-19 pandemic, the WB Country Team also prepared an Operational Framework aligned with the WBG Crisis Response Approach Paper. The Framework is intended to support Pakistan respond to the crisis and prepare to bounce back stronger and faster. The Framework has four Pillars: (i) protecting lives; (ii) protecting the poor; (iii) protecting livelihoods; and (iv) securing the future. The International Finance Corporation (IFC) Strategy (FY2021-24) was delivered in FY2020, and focuses on stepping up engagement in critical sectors and opening of new

[17] The period between 2001 and 2015 was characterized by an uninterrupted and significant decline in poverty, from 64.3 percent in 2001 to 24.3 percent in 2015. World Bank. 2019 *Pakistan@100: Shaping the Future*

[18] World Bank Group, Pakistan Country Partnership Strategy, 2015-2020 (Report no. 84645-PK), extended till 2021 by the Performance and Learning Review (Report no. 113574).

markets by leveraging reforms in areas such as housing, inclusion (digital/micro, small and medium enterprises [MSMEs]), urban, and energy. A Systematic Country Diagnostic (SCD) report has been finalized and the Country Partnership Framework will be presented to the Board in Q4-FY2021. Consultations for the CPF will begin early November 2020.

17. **The WBG's ongoing and planned support to Pakistan has been realigned with the government's pandemic response.** The WB's immediate support included the US$200 million Pandemic Response Effectiveness in Pakistan (PREP) project and repurposing of US$40 million from eight ongoing projects for urgently needed equipment and supplies. Two Development Policy Operations (US$1 billion) supported Pakistan to: (i) enhance human capital accumulation and improve federal safety nets to respond to shocks, including those from COVID-19 pandemic; and (ii) strengthen the fiscal framework, and promote growth and transparency. An emergency Program for Results in the Education sector was approved by the Board on July 31 2020 along with an emergency project to respond to the locust outbreak and food security.[19] Two human capital projects provided US$ 236 million to support the response in some of the poorest districts in the country.[20] A hydropower project approved by the Board on September 23, 2020, supports energy sector investments that are critical to build resilience and support recovery from the economic effects of the pandemic.[21]

18. The remaining pipeline for FY2021 was revised to frontload investments that support immediate needs as identified by the Framework across the four pillars. Priority is being given to projects with: (i) direct COVID-19 interventions contributing to the pillars of the operational framework; (ii) high likelihood to disburse quickly, within 12 to 24 months; (iii) simplified implementation arrangements; and/or (iv) directly linked to medium-term priorities that increase resilience to exogenous shocks. Preparation of three additional projects that meet the objectives of the Framework and the selectivity criteria above have been prioritized: the Crisis-Resilient Social Protection (CRISP, P174484) which supports COVID-19 related enhancement to the delivery systems for social protection across the country; the Sindh Resilience Project (SRP) Additional Financing (P173087) which contributes to reducing vulnerability to disasters and public health emergencies in Sindh; and SWEEP, which mitigates flooding and COVID-19 risks in Karachi. Three Development Policy Operations are also being prepared this fiscal year to support critical reforms necessary for building back better.[22]

19. **IFC also engaged with the banking sector in providing non-financial services that support MSME portfolios**. These services include risk assessments and stress testing. Going forward, IFC is working to support MSMEs in key sectors impacted by COVID-19, such as textiles, auto, pharmaceuticals and agriculture, through risk-sharing facilities and credit enhancement with local banks. IFC is also in discussion with businesses in the manufacturing and infrastructure sectors to support investment needs in the post-COVID-19 recovery phase. Additionally, IFC has initiated four upstream projects to support Public Private Partnerships (PPPs) in healthcare, water and access to finance women entrepreneurs which will provide an impetus for medium term economic recovery. The Global COVID-19 Facility of the IFC approved an increase of US$30 million to support MSMEs impacted by the pandemic through existing short-term trade facilities with five banks.

20. **The Multilateral Investment Guarantee Agency (MIGA) has continued to support cross-border investors and lenders during these challenging times.** MIGA's US$318 million gross outstanding exposure in Pakistan comprises four projects in the manufacturing, finance and energy sectors. MIGA is monitoring developments in Pakistan, particularly in the energy sector, where the agency is supporting two hydropower projects. In April 2020, MIGA launched a US$6.5

[19] These include: Actions to Strengthen Performance for Inclusive and Responsive Education Program (ASPIRE, P173399); Locust Emergency and Food Security Project (LEAFS, P174314)
[20] Khyber Pakhtunkhwa Human Capital Project (P166309) and Balochistan Human Capital Investment Project (P166308) approved by the Board on June 23, 2020.
[21] Khyber Pakhtunkhwa Hydropower and Renewable Energy Development (KHRE, P163461) Karachi Neighborhood Improvement Project (KNIP, P161980), and Competitive and Livable City of Karachi (CLICK, P161402)
[22] These include: Program for Affordable and Clean Energy (PACE, P174553); Securing Human Investments to Foster Transformation II (SHIFT II, P172628); Second Resilient Institutions for Sustainable Economy program (RISE II, P172648)

billion fast-track facility to help investors and lenders tackle COVID-19, which is available to support Pakistan but has not yet been utilized.

21. **Cross-sectoral coordination is maintained with multilateral and bilateral institutions through forums such as the Development Partner Meetings hosted by the WB**. Aligned with the Bank's initial COVID-19 emergency response, the Asian Development Bank approved a US$300 million emergency assistance loan to strengthen Pakistan's public health response to the COVID-19 pandemic and is also providing US$500 million from its Comprehensive Pandemic Response Option. The International Monetary Fund (IMF) disbursed US$1.4 billion under the Rapid Financing Instrument (RFI) to address the economic impact of the COVID-19 shock. An online Partners Platform is managed by the United Nations Children's Fund that coordinates additional financing requirements of the Government, as articulated in the Pakistan Preparedness and Response Plan (PPRP) which estimates US$595 million in additional external financing requirements for the medical health response.

22. **The proposed Project is aligned with the WB's CPS (FY2015-20), and with the twin goals of ending extreme poverty and promoting shared prosperity.** It supports 'Results Area IV: Service Delivery' of the CPS by supporting improvements in service delivery. The Project specifically supports CPS Outcome 4.5: Improved urban management in cities. Similarly, the Project will contribute to achieving the strategic objective, "Develop an enabling environment to foster private investments", under which "Inadequate urban infrastructure and services" was identified as a key impediment, and "Improved urban management in targeted cities" prescribed as the CPS target. It is also aligned with the Bank's strategy of identifying and addressing risks associated with disasters and climate change which may hamper achievement of its twin goals. A key early finding from the upcoming SCD relates to how the poor livability of Pakistan's urban centers affects the poorest the most. This is true of SWEEP's context and beneficiaries: low-income residents make up the bulk of populations living around drains, often in informal settlements (or *katchi abadies).* These low-income neighborhoods are typically underserved in terms of solid waste collection services and are disproportionately impacted by floods. Also, workers in the SWM sector are disproportionately comprised of members of disadvantaged groups, who are more vulnerable to health shocks and disruptions of livelihoods due to COVID-19. Project interventions are therefore particularly focused on improving living conditions and livelihoods for vulnerable populations.

23. **SWEEP supports Pillar 2 of the Operational Framework to address the COVID-19 pandemic related to "Protecting the Poor".** SWEEP's development objective and specified outcomes focus on COVID-19, and interventions to be implemented over this fiscal year aim to mitigate impacts of the pandemic. The Project supports communities and local governments to cope with immediate crisis impacts, employment and productivity for vulnerable households, and improve delivery systems for expanded coverage of services and greater resilience for future shocks.

24. **The Project contributes to the 2030 Agenda for Sustainable Development adopted by all United Nations Member States in 2015.** The project outcomes are linked to Sustainable Development Goal 11: "Make cities inclusive, safe, resilient and sustainable". SWEEP also includes measures to mitigate and adapt to climate change.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

25. The Project Development Objective (PDO) is to mitigate the impacts of flooding and COVID-19 emergencies, and to improve solid waste management services in Karachi.

PDO Level Indicators

26. PDO indicators are as follows:

a. Number of persons for whom flood risks and exposure to pathogens, including COVID-19, is reduced through cleanup of drainage channels (number); and, of which female (percentage)
b. Number of residents for whom urban living conditions have improved owing to better solid waste management services (number); and, of which female (percentage)
c. Quantity of solid waste collected from Karachi daily that is safely disposed (metric tons)

B. Project Components

27. The Project will include interventions that will be implemented over two phases: (i) immediate emergency response, which includes activities that, a) mitigate high flood risks linked to the 2020 monsoon and caused by accumulation of solid waste in natural drainage channels (*nullahs*), and b) reduce public health risks and exposure to poorly managed COVID-19 contaminated waste; and (ii) medium-to-long-term phase, improves critical SWM infrastructure and service delivery to address the underlying risk factors leading to recurring emergency flooding situations. Refer to Annex 2 for a detailed description of project components.

Component 1: Immediate Emergency Response Interventions (US$11 million; WB financing: US$11.0 million)

28. Component 1 will support:

a. Cleaning of *nullahs* and disposal of waste, including: (i) removing waste obstructing the flow of water and restoring the drainage capacity of the *nullahs*; and (ii) construction of a temporary storage cell for waste and sediments cleared from *nullahs* at the Jam Chakro dumpsite.

b. Development and implementation of a targeted communication and awareness campaign aimed at communities living around the *nullahs*.

Component 2: Development of Solid Waste Management Backbone Infrastructure (Total cost: US$84.0 million; WB financing: US$84.0 million)

29. Component 2 will support:

a. Provision of urgent collection equipment for under-served districts and improvement of *Kachra Kundis*,[23] including: (i) provision of critical equipment to improve occupational safety and collection efficiency, such as personal protective equipment for workers, collection trucks, bins, and containers; and (ii) upgrading of up to thirty existing *kachra kundis* and the construction of approximately fifty *kachra kundis*.
b. Construction of a new sanitary disposal cell at Jam Chakro dumpsite, including: (i) design and construction of a new landfill cell; (ii) design and construction of a manual material recovery facility adjacent to the disposal cell; (iii) implementation of measures to improve safety and environmental performance of the dumpsite; (iv) progressive closure and rehabilitation of areas that have reached capacity; and (v) development and implementation of community support plan for waste pickers living at Jam Chakro.
c. Construction and/or upgrading of transfer stations, including the development and implementation of an appropriate operating model for the operation and maintenance of the transfer stations.
d. Development of long-term waste solutions for Karachi, including: (i) planning, design and construction of a new sanitary landfill with associated facility; (ii) planning, carrying out of feasibility studies, engineering design, development of business and operating models, and provision of advisory services for the preparation of a large ecosystem of waste treatment solutions; (iii) design and construction of solutions to improve treatment of non-municipal waste streams such as medical waste and/or construction and demolition waste, including: (a) assessment of existing systems for collection, transport and disposal of such waste streams; (b) identification of gaps to be addressed through processes, investments and technologies; (c) development of

[23] *Kachra Kundis* are designated waste collection points consisting of basic concrete slabs with minimal confinement, where waste accumulates awaiting collection.

service improvement plans needed to build end-to-end solutions for each stream, as well as policy recommendations on regulation and tariffs for producers; and (d) identification of priority investments.

Component 3: Project Management and Implementation Support (Total cost: US$10 million; WB financing: US$5.0 million)

30. Support for implementing agencies to manage, implement, and supervise Project activities and investments and training and skill development in the areas of monitoring and evaluation, communication, audits, social and environmental management, engineering, operations and maintenance, and Project management.

C. Project Beneficiaries

31. Three groups are expected to directly benefit from SWEEP: (a) residents of Karachi, who are provided improved urban living conditions through increased coverage and quality of SWM services and better environmental, social and health conditions; (b) communities living around *nullahs* and other flooding hotspots, which benefit from reduced flooding and public health risks; and (c) sanitation workers with safer working conditions and reduced health risks.

D. Results Chain

32. The links between the Project activities, outputs and outcomes are presented in Figure 1.

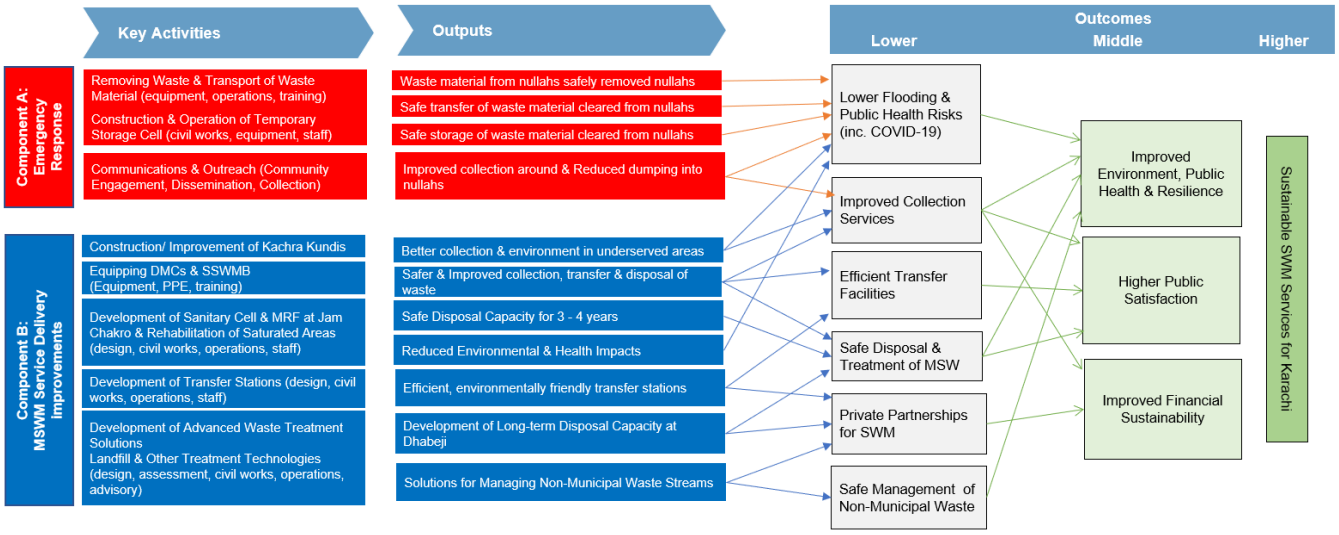

Figure 1: Theory of Change

E. Rationale for Bank Involvement and Role of Partners

33. **The WB brings global experience from over 80 projects in the SWM sector since 2014, which offer proven and integrated solutions to improve SWM in Karachi.** The Bank has technical expertise and resources in key aspects of SWM, including: private sector engagement in service delivery; strong standards for environmental and social management; addressing informal waste pickers; and institutional strengthening and capacity building in an integrated fashion. The WB's support to the SWM sector in Karachi—through SWEEP and CLICK—will address key challenges, including weak institutional, regulatory and technical capacity for design and management of infrastructure; low levels of professionalization in the provision of a key urban service; lack of financial sustainability for service provision; low participation of the private sector; serious environmental and social impacts, including leakage of plastics and the

vulnerability of informal workers in the sector; low resilience against the impacts of natural disasters and climate change. TA and institutional strengthening interventions under CLICK will strongly complement investments under SWEEP for integrated SWM sector development. Refer to Annex 5 for details.

34. **SWEEP will address governance issues and barriers to the entry of the private sector.** The fragmented governance structure of Karachi has been broadly recognized as one of the core challenges to improved infrastructure and service provision. Multiple provincial and local agencies with overlapping mandates and unclear roles, insufficient planning and coordination, and unsustainable financing need to be addressed for the city to become more livable and to tap into its economic potential. The role of the private sector will be key in this regard. The IFC's ongoing dialogue with the GoS supports developing private-sector solutions and promote competition. Refer to Annex 5 for details.

F. Lessons Learned and Reflected in the Project Design

35. **Emergency operations have a higher chance of success if they focus on simplified implementation arrangements.** Past experiences from emergency recovery and disaster management have illustrated the need to simplify implementation arrangements as much as possible, especially the number and responsibilities of implementing agencies. SWEEP has a one implementing agency and implementation arrangements are mainstreamed with existing roles and institutional mandate.

36. **SWM needs to be addressed in an integrated and comprehensive manner.** Projects across the globe have demonstrated the need to adopt integrated service delivery approaches for improving SWM, including collection, transportation, treatment, and safe disposal. Broken value chain systems are a major reason for waste leakage, leading to environmental and public health hazards, and negatively impact livability and competitiveness of cities. Global experience also emphasizes the importance of enabling policy and institutional frameworks and financial sustainability mechanisms. Hence, the World Bank's support to the SWM sector in Karachi through SWEEP and CLICK represents a comprehensive package addressing all aspects of the service delivery system in a coordinated and planned manner.

37. **Availability of land for backbone infrastructure, particularly sanitary landfills, is a key determinant for success.** While waste minimization through a 3Rs (reuse, recycle, reduce) approach must be at the center of sustainable SWM systems, engineered landfill facilities are always necessary for safe disposal of inert waste, rejects and other residual waste. Landfill facilities are particularly required for rapidly expanding urban areas where a zero-waste approach is a long-term objective, thus requiring sanitary landfills as essential to SWM systems. Global experience shows that volume reduction strategies take longer to demonstrate substantial impacts, unless significant investment and effort are made to improve recycling capacity and uptake, which considerably increases SWM costs.

38. **Under SWEEP, investments in sanitary landfills and waste treatment solutions follow a phased approach,** specifically in first developing an interim solution at an existing site. This first phase will allow implementing agencies to consider viable options and make decide on the most appropriate long-term solutions for the site. Importantly, GoS owns large landholdings in and around Karachi, which are being considered as possible locations for SWM activities and will provide options for selection of appropriate sites during implementation.

39. **Strong communications, citizen engagement, and solutions for informal workers are essential complements of infrastructure investments.** A focused communications campaign will accompany cleanup of *nullahs* to promote safer disposal practices. Similarly, engaging community members, including scavengers living around Jam Chakro, will be central to achieving efficient disposal solutions and safer conditions for material recovery. Other SWM infrastructure, such as waste transfer stations and *kachra kundis*, will also include targeted interventions to engage residents, complemented by a wider behavior change and communications campaign in Karachi as part of CLICK.

40. **Financial sustainability is essential to the long-term sustainability of SWM service delivery systems.** Given substantial operating costs in the sector, establishing revenue streams is critical to ensure adequate operations and

maintenance (O&M) of SWM infrastructure is sustainable. TA to SSWMB and interventions to improve the financial position of local councils, is essential to sustain SWM services and operations. Moreover, development of SWM infrastructure and solutions under SWEEP will be directly informed by the SWM sector investment plan for Karachi developed under CLICK, identifying opportunities to crowd-in private investment at critical points in the supply chain.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

41. **SWEEP's implementation arrangements are based on the institutional mandates of relevant agencies.** The Local Government Department (LGD) represents the umbrella institution for all implementing agencies as the parent body for all local governments and with SSWMB established as an attached entity. A Steering Committee, headed by the Chairman, Planning and Development (P&D) Board, with representatives from relevant GoS agencies, will provide overall strategic oversight, review progress, resolve inter-agency disputes, and provide approvals for project-related matters as needed.

42. **The SSWMB will be the primary implementing agency for SWEEP and will establish a project implementation unit (PIU) with full-time dedicated staff with technical expertise in engineering, environmental and social safeguards, procurement, financial management and other key functions.** The SSWMB has the mandate to: transport and transfer waste (the middle end), including of transfer facility operations; conduct disposal of solid waste and oversee the O&M of disposal facilities; and manage waste collection services in three districts in Karachi (provided by private contractors). The SWEEP PIU has been notified and a Project Director appointed by the GoS, with further resources to be recruited after effectiveness. SWEEP PIU will be responsible for implementation of all activities. The SSWMB will also procure equipment for District Municipal Corporations (DMCs), as needed, to carry out waste collection, routine cleanup and maintenance tasks. Further, SSWMB will develop and adopt an Operations Manual for implementation of the Project.

43. **The PIU established under LGD for CLICK will support project preparation and immediate emergency activities under Component 1 of SWEEP**, **as a shared services unit**. The PIU will continue to be responsible for implementation of CLICK components aimed at: (a) Providing Performance Grants and technical assistance to local councils; and, (b) Institutional strengthening and TA to SSWMB. Under the latter component, CLICK PIU will resources to the SSWMB, including, Technical Specialist for Waste Collection Services, Performance Management Specialist, and Legal Specialist. Also, the CLICK PIU will provide backstopping support to the SWEEP PIU during the first year of the project. The SWEEP PIU will be supported by the Karachi Metropolitan Corporation-(KMC) for emergency pre-monsoon cleaning of *nullahs*. The KMC maintains around 40 major *nullahs* in Karachi and employs engineering and associated staff.

B. Results Monitoring and Evaluation Arrangements

44. **The PIU will prepare quarterly and annual progress reports and provide data for the Results Framework to the WB.** The PIU will hire staff (or consultants) to provide monitoring and evaluation (M&E) services, including data collection and analysis for reporting on project results (e.g. indicators, outputs and outcomes) and specialized agencies will be considered for provision of training and equipment to sanitary workers. Infrastructure delivered under SWEEP will be integrated with the performance management system being designed for the SSWMB under CLICK. The generation of timely and accurate data will allow a performance assessment of facilities to evaluate: disposal and recovered waste, throughput for transfer stations, regular clearing of collection infrastructure and equipment. These information streams will also inform studies on the volume of waste and source of generation.

C. Sustainability

45. **The project design integrates institutional strengthening and TA interventions under CLICK to provide a sustainable solution for improving the SWM sector in Karachi.** Several dimensions of sustainability are being incorporated, including: (a) infrastructure financed under SWEEP will provide the foundations for service delivery

improvements targeted under CLICK, while enhanced institutional and revenue performance achieved through CLICK will feed back into efficient O&M of new infrastructure. This incremental approach to infrastructure and technology upgrades, which goes in tandem with the increase of institutional capacity at provincial and district levels to manage a more complex system, will lead to sustainable outcomes in service delivery; (b) a clear understanding of costs associated with all services along the value chain, and financial flows that guarantee payment of these costs will be critical to long-term financial sustainability of the sector. SWM is a public service that local governments often need to assume, with low cost recovery margins, until the quality of the service is high enough to charge for it. As the provision of SWM services in Karachi improves, it is expected that households will gradually increase the level of payment for SWM services, thereby reducing costs for the GoS. As conditions improve, the participation of private sector providers will also contribute to the sustainability of the overall system; (c) the phased improvement of environmental conditions at the Jam Chakro dumpsite and other facilities currently impacted by poor SWM practices (e.g. transfer stations, *kachra kundis*) will progressively reduce cumulative impacts on the neighboring areas and improve long-term sustainability of the facilities. Moreover, incorporation of waste pickers in an integrated SWM solution for Karachi will be essential. Waste pickers provide essential recycling services, and improving the quality of life and livelihood opportunities of this highly vulnerable group by integrating it into the long term solution adds to the sustainability of the overall approach; and (d) communications and behavioral change campaigns will ensure that individuals internalize the responsibility for waste generation and illegal dumping of waste is stopped.

IV. PROJECT APPRAISAL SUMMARY

A. Technical and Economic Analysis

Technical Appraisal

46. **Emergency works under Component 1 are scheduled to take place prior to SWEEP's approval.** The temporary storage and dewatering facility represents a simple and robust engineering solution, which involves the construction of a lagoon-like structure enclosed by packed earth berms and a lining to control percolation of water content within the waste, and modular design to allow rapid construction and commissioning. The facility will receive waste cleared from *nullahs* for a limited duration, with the final disposal of such waste planned in the sanitary landfill cell to be constructed at the same dumping site. The design and construction supervision of the cell involves qualified engineering consultants and the SSWMB is expected to have the capacity for O&M of the temporary cell. Similarly, the KMC and the CLICK PIU will support the SWEEP PIU in cleaning of *nullahs* under the emergency component. The cleaning operation involves the use of better equipment to remove and transport waste, pre-selected optimized routes, and localized measures to minimize any impacts on communities.

47. **Under Component 2, SWEEP will finance investments for SWM backbone infrastructure that are critical to improve services in Karachi.** The design and construction of the sanitary cell will be the first large investment under SWEEP. The sanitary cell is expected to use standard engineering design and represents a solution for disposing waste coming to Jam Chakro for the next three to four years. Consultants with international experience will be contracted for the engineering design of the cell and supervision of the works, as well as for environment and social assessments, planning, and implementation of plans. The SSWMB will recruit key technical resources in the PIU and will also provide trainings to build requisite skills concerning O&M of facilities. Consultants with international experience will also be engaged to advise the SSWMB on operation of the cell.

48. **As part of CLICK, a SWM master planning activity is expected to prepare a long-term investment and financing plan for the sector, along with policy and regulatory recommendations for sustainable operations.** The SWM Master Plan will use data made available through several studies covering baseline conditions of the current system, including: environment and social aspects; waste generation; characterization; willingness to pay; technical and economic feasibility of viable technology; informal waste sector; and opportunities for crowding in private investments. While the COVID-19

crisis has delayed the activity, the SSWMB is expected to resume this as soon as the situation allows, primarily through contracting consultants with international experience, collecting field data, and conducting surveys, and so forth. Outputs from these activities will inform the location, selection and specifications for subsequent investments under Component 2, including transfer stations and advanced treatment solutions. The potential investment at Dhabeji is important since it represents a long-term disposal solution for Karachi. SWEEP will support the development and implementation of an appropriate operating model for the landfill and transfer facilities, likely with private sector participation.

49. **The SSWMB is working with DMCs to finalize details of equipment that is provided under Component 2.** The procurement of the equipment is expected soon after the project becomes effective; this will supply critical needs to resume services and includes PPE and trainings for staff. The DMCs will also identify equipment that can be rehabilitated or refurbished. In addition, DMCs will be required to develop and submit O&M plans for: (a) rehabilitated and new machinery provided under SWEEP; and (b) retrofitted and new *kachra kundis* within their jurisdiction. Implementation of these plans will be monitored under the performance grants component of CLICK and conducted on an annual basis. It is important to note that CLICK provides strong monitoring tools and an incentive structure where any deficiencies in implementation and expenditures will affect release of annual performance grants to these councils. CLICK requires the DMCs to: (a) adopt and use a computerized financial management system; (b) maintain and submit audited financial statements for the annual performance assessment; and (c) prepare and reflect cost estimates and budget allocations for O&M in Annual Development Plans (ADPs). Equally important, CLICK includes measures to ensure that local councils (LCs) have available funds for O&M and service delivery improvements over the next five years. LCs are also required, and supported, to develop their own revenue stream improvement plans and provide incentives through the performance grants to increase revenues during the implementation period.

Economic Analysis

50. **An economic analysis of SWEEP confirms that proposed investments are economically viable.** The economic analysis considered benefits of flood risk mitigation from SWM infrastructure investments in Karachi. The analysis determined the net present value (NPV), internal rate of return (IRR) and present value of benefits-to-cost ratio over 20 years. The economic analysis specifically covered: (a) averted loss of opportunities by the reduction of disruptive severe-flood-days per year over the course of the Project; and (b) hedonic pricing for the incremental value of land associated with the reduction of disruptive severe-flood-days. However, other significant benefits that are expected to accrue could not be valued due to lack of available data, such as: reduced health risks, environmental impacts, carbon emissions, and cost of damages to infrastructure. The economic analysis indicates that the net benefits of the Project exceed its costs; the IRR is positive and adequate (11 percent) using a 5 percent discount rate. Further details are available in Annex 3.

51. **Details of investments in collection, transfer, and disposal infrastructure are not known currently and a full economic analysis will be done as part of the detailed design.** A preliminary assessment of the Jam Chakro sanitary disposal cell is being undertaken, which considers technical alternatives and economic returns associated with comparable landfill cells in other countries. Similarly, the activity to develop an SWM Master Plan under CLICK will provide details of the technical solution(s) and economic analyses for advanced waste treatment solutions.

52. **Landfilling remains an essential part of any waste disposal solution and is the lowest cost baseline solution**. The GoS owns adequate land around Karachi for the landfill facilities. This is a critical advantage as land is the largest economic and functional determinant when considering landfill investments. CLICK includes studies to assess the viability of advanced technologies, in terms of cost implications, waste composition across the city (existing and potential), cost recovery from households and businesses, energy markets, among others.

B. Fiduciary

(i) Financial Management

53. **Financial management (FM) of SWEEP will be the responsibility of the PIU.** In early 2020, a capacity assessment of the SSWMB concluded that it has adequate FM systems, which are adequately functioning, and with reasonable assurance can provide accurate and timely information on the status of project funds and disbursements, as required by the WB. The SSWMB PIU, with support from the SSWMB's Accounts and Finance section, will be responsible for implementation of SWEEP's FM arrangements. Budgeting processes of the GoS will apply, and SWEEP will be part of the annual development budget for the province. Project funds for SWEEP will be disbursed to a segregated Designated Account (DA) that will be established by the SSWMB at the National Bank of Pakistan to receive the funds. Disbursements will be report-based in which an advance equivalent to a six months forecast will be provided in the DA. Separate books of accounts will be maintained on a cash basis of accounting to record receipts and payments under the Project for each component. Relevant internal controls of the GoS, complemented with control environment of SSWMB, will be employed to fulfill its FM responsibilities. In real-time, transactions will be entered into the National Financial Management Information System. The PIU will prepare and submit bi-annual interim unaudited financial reports (IUFRs) to the Bank within 45 days of the close of each semester. The Project's Annual Financial Statements will be prepared in accordance with the Cash Basis International Public Sector Accounting Standards (IPSAS) and audited by the Auditor General of Pakistan (AGP). The audited financial statements will be submitted to the Bank within six months of the financial year end.

54. **Retroactive financing**. A provision of retroactive financing up to up to the amount specified in the loan agreement is admissible for eligible expenditures incurred since January 1, 2020. Upon signing of the loan agreement, expenditures incurred by the GoS from its own sources will be reimbursed to the GoS from SWEEP's loan proceeds, provided that the WB's environment and safeguard measures are complied with. Refer to Annex 1 for details.

(ii) Procurement

55. **Project procurement will follow the WB's Procurement Regulations for IPF Borrowers for Goods, Works, Non-Consulting Services and Consulting Services dated July 1, 2016 (revised November 2017 and August 2018).** WB's Anti-Corruption Guidelines dated October 15, 2006, and revised in January 2011 and July 2016, will also apply. The implementing agency is the SSWMB through its PIU, for which the Project Director (PD) has been notified. The CLICK PIU (LGD) will support SWEEP in the technical, administrative, and procurement aspects of the project while the SSWMB PIU is being set up. Under Component 1, emergency *nullah* cleaning works were performed over July–August 2020 using direct contracting for seven contracts (US$6.4 million equivalent), which will be reviewed for retroactive financing.

56. **Components 2 and 3 will be implemented through works, goods, and consultancy contracts**. The largest contracts for works include the construction of a sanitary landfill cell for municipal solid waste at Jam Chakro and a landfill at Dhabeji, which each cost an estimate of US$20 million. The SSWMB has experience for solid waste collection service contracts in three districts and has a procurement section with limited capacity. A major aspect is the private-sector appetite to take up the specialized works contracts, because the contract sizes are not adequately large to attract major international firms, and local expertise in similar constructions is limited. The Project Procurement Strategy for Development (PPSD) addresses the market potential and the SSWMB will disseminate the bidding documents to solicit viable service provides. There are also contracts of goods to purchase machinery estimated at US$5 million and approximately US$3 million for rehabilitation of machinery. An asset review will be done to determine the financial and technical viability of the rehabilitation proposal and procurement admissibility. Consultancies will include the design and supervision of the landfill sites estimated at US$1.2 million, and smaller contracts for Environmental and Social Impact Assessments (ESIA) and support for goods procurement.

57. **The procurement risk rating is Moderate.** The rating is justified given the estimated cost of planned activities, agreed risk mitigation measures of augmented procurement and contract management competencies in the PIU, project implementation support, market outreach, and preparation of procurement packages.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

58. **Environmental and Social Risks.** Project activities are intended to create positive environmental impacts by reducing flood and public health risks and improving solid waste collection, transfer, and disposal systems in accord with international standards. However, the environmental risk is classified as High due to environmental health and safety (EHS) risks associated with: (a) *nullah* cleaning in densely populated areas; (b) transportation and temporary storage of potentially biologically and chemically contaminated wet wastes; (c) safety improvement and rehabilitation works of Jam Chakro landfill site which requires historical EHS issues to be addressed (e.g. leachate, landfill gas, dust from waste, contaminated soil and groundwater, risks of waste collapse, etc.); (d) construction and operation of collection points, transfer station, sanitary land fill cell at Jam Chakro; and (e) advanced waste management facility in Dhabeji.

59. **Social risks are also assessed as High.** No private land acquisition is anticipated under the Project. However, the city has problems of encroachment with significant informal settlements on public land. The cleaning of *nullahs* does not involve any removal of encroachment from drains. However, there is a moderate risk of inadvertent damage during *nullah* cleaning to structures set up for livelihood support, sometimes extending into *nullahs*. Such cases, if any, will be recorded along with associated livelihood impacts in the Environment and Social (E&S) audit, and compensation for affected persons included in the gap filling action plan. Removal of material from *nullahs* to the dumpsite may pose health and safety risks to communities near *nullahs* and along transport routes due to spillage of contaminated material. Under Component 2, a major risk pertains to potential resettlement of approximately 400 households at the Jam Chakro dumpsite. A complete assessment of resettlement impacts for Jam Chakro will be done during implementation. A Resettlement Plan (RP), in accordance with the Resettlement Framework (RF), will be prepared and implemented. There may be additional risks of resettlement for informal settlements and/or encroachers concerning transfer stations, the new landfill (likely at Dhabeji), or treatment infrastructure for non-municipal waste streams, though these are estimated to be much smaller compared to Jam Chakro. Any additional resettlement or economic displacement needs will be determined during implementation and requisite RPs prepared and implemented.

60. **While local labor will be preferred, influx of labor and labor camps may be anticipated for the construction of the sanitary cell and the development of the new sanitary landfill.** An assessment will be made when preparing these interventions. There is a significant risk of gender based violence (GBV) or Sexual Exploitation and Abuse (SEA) from construction labor, for women waste-pickers and children living at Jam Chakro. These are poor and marginalized communities at risk of exploitation, with poor protection mechanisms. In case of GBV incidents survivors may have reduced access to requisite support systems. The construction activities for *kachra kundis* and transfer stations will take place in the city, and while risks of GBV/SEA may be reduced in dense settings, these may be moderate to substantial for women sanitary workers and children. Hence at appraisal, GBV/SEA risks are assessed as substantial. The GBV risk assessment tool will be used for final assessment at design stage for subprojects and GBV Action Plans prepared.

61. Additional social risks identified relate to: significant role of unregulated, informal sector in waste picking and recycling, and the control of power groups within; involvement of migrants and minors in waste recovery; health and safety risks for waste-pickers, sanitary workers, and workers involved in *nullah* cleaning and construction activity at the

dumpsite; exploitation of informal workers, many of whom are marginalized and extremely poor, by middlemen and contractors managing dumpsites; and, lack of meaningful engagement with groups such as women and residents of low income settlements, about their service delivery needs. Low capacity of the implementing agency to manage social issues also raises the risk.

62. **Risks from Anti-encroachment Drive (AED).** An anti-encroachment drive was undertaken in many parts of Karachi in late 2018. Mitigation actions to address risks associated with anti-encroachment activities will be incorporated under SWEEP, with screening and site selection measures to avoid project-related risks and ensure compliance with the Bank's social management policies. The Environment and Social Commitment Plan (ESCP) mandates that no upgradation or fresh construction of transfer stations, landfills, or treatment infrastructure for non-municipal waste streams, will take place on sites where anti-encroachment measures have been taken since November 21, 2019.

63. **Environmental and Social Standards (ESSs).** Seven ESSs are relevant: ESS 1-Assessment and Management of Environmental and Social Risks and Impacts; ESS2-Labor and Working Conditions; ESS3-Resource Efficiency and Pollution Prevention and Management; ESS4-Community Health and Safety; ESS5-Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; ESS6-Biodiversity Conservation and Sustainable Management of Living Natural Resources; and ESS10-Stakeholder Engagement and Information Disclosure.

64. **Environment and Social Instruments.** The implementing agencies developed the ESCP, a draft Stakeholder Engagement Plan (SEP), a draft Environmental and Social Management Framework (ESMF), and an early draft of the Resettlement Framework (RF), which were reviewed and cleared by the World Bank and disclosed in-country,[24] and on the Bank's website.[25] The ESCP, revised and agreed during project negotiations, includes commitments to update and redisclose the ESMF, SEP, and RF, after the Bank's review and clearance within 60 days of effectiveness. The draft SEP will be updated through additional consultations. The draft ESMF includes the screening process to integrate environmental and social considerations in subprojects and inform site-specific E&S instruments. The ESMF also includes the E&S Audit process and requirements for activities under Component 1. The draft RF sets out key principles and requirements for compensation concerning any resettlement involved with project investment. Once the locations of subprojects are finalized, site specific ESIAs, Environmental and Social Management Plans (ESMPs) and/or Resettlement Plans (RPs) will be prepared by independent consultants, consulted on, and cleared by the WB, and disclosed prior to bidding for works.

65. **Environmental and Social Management for retroactive financing**. Since the project may retroactively reimburse expenditures under Component 1, a third-party E&S Audit will be carried out to review compliance of emergency response activities with the ESMF, identify any gaps between policy requirements and actual execution, and propose gap-filling measures. Retroactive financing will be approved and made available upon implementation of the corrective action plan based on the E&S Audit findings, and the commitment to complete the E&S Audit and timeframe is recorded in the ESCP. GoS has environmental and social protocols to be applied for construction and operation of the temporary storage cell and for *nullah* cleaning. While these protocols are prepared in accordance with national regulations, the Bank advised counterparts to incorporate ESF requirements so that potential gaps, to be identified through E&S audit, may be minimized. Temporary storage capacity for waste cleared from *nullahs* is required to be available prior to the start of *nullahs* cleaning works, which envisage the use of equipment to reduce residual water content from cleared waste as well as specified routes for transfer of waste. Each contractor will be required to prepare a Dredged Materials Collection, Transport, Disposal and Management Plan for the proper management of collected waste. The temporary storage facility will be equipped with raised berms to form a waterproof lagoon-like structure, lined with synthetic liner to contain and evaporate the leachate. Once the sanitary landfill cell starts operation in around one year's time, the wastes stored at

[24] Available at: SSWMB website and LGD website
[25] Available at: ESCP; SEP; ESMF; RF.

temporary storage cell will be transported to the sanitary landfill cell with leachate collection and treatment system.

66. **Environmental and Social Instruments for Component 2.** The Project uses a framework approach, and E&S instruments for Component 2 will be prepared during project implementation, per the schedule in the ESCP.

(a) As the location of the transfer stations and *kuchra kundis* is not yet known, the draft ESMF, including Labor Management Plan, will be updated, consulted on, cleared by the Bank, and disclosed within 60 days of project effectiveness. Once these locations are finalized, site specific ESIA/ESMPs and RPs (if required) will be prepared, consulted on, cleared by the Bank and disclosed prior to issuing bid documents for corresponding works.
(b) ESIAs/ESMPs, as required, will be prepared, and include a detailed social assessment focusing on the informal settlement, for activities at Jam Chakro, including: development of the new sanitary cell on the remaining area available at the dumpsite; construction of a material recycling facility at Jam Chakro for waste diversion; measures to improve safety and environmental performance of the Jam Chakro dumpsite; and, rehabilitation of areas at Jam Chakro used for dumping till date. These documents will be prepared, consulted on, cleared by the Bank and disclosed prior to issuing bid documents for works. Progressive closure and rehabilitation of saturated areas at Jam Chakro dumpsite would use standard methods, such as: slope stabilization, leachate collection and treatment, installation of gas vents, diversion and control of surface water run-off, application of soil cover, vegetation and greening, etc. Comprehensive mitigation measures will be developed based on EHS risk and impact assessment of legacy pollution in the ESIA.
(c) An ESIA/ESMP for the Development of Advanced Waste Treatment Facility in Dhabeji will be prepared, consulted on, cleared by the Bank and disclosed prior to issuing bid documents for the corresponding works.
(d) Once plans for the sanitary cell at Jam Chakro are finalized, a comprehensive RP for the informal settlement at Jam Chakro will be designed, consulted on, reviewed and cleared by the World Bank, and publicly disclosed. A commitment to prepare and implement the RP within the lifetime of the Project is included in the ESCP.

67. **Environmental and Social Management Capacity.** The SSWMB and KMC do not have environmental and social specialists, while the CLICK PIU employs an Environmental Specialist and a Social Specialist, who supported the implementation of environmental and social protocols for emergency activities under Component 1. To strengthen the capacity of implementation agencies, an environmental specialist, a health and safety specialist, a resettlement specialist, a social development specialist for gender and inclusion, and a communication specialist will be recruited by the SSWMB PIU. In addition, a third-party E&S audit firm will be hired. Extensive training for environmental and social activities will be carried out as part of various, site-specific environmental and social instruments.

E. Citizen Engagement

68. SWEEP supports social mobilization activities, an SEP, and a behavioral change campaign to raise awareness and engage citizens to improve SWM and recycling practices in Karachi. Risk mitigation activities under Component 1 make use of community-level engagement to achieve sectoral outcomes. Also, the design and development of infrastructure under Component 2 will be carried out using a systematic consultation process to increase citizen engagement, especially from women and communities living in low-income areas, and private sector investment in the planning and design. Subsequent feedback from participants will be used to assess how well their priorities are reflected in the design and delivery of subprojects. A beneficiary feedback indicator is included in the Results Framework. The SEP includes a Grievance Redress Mechanism (GRM), which will build on the SSWMB's existing systems, and made available to all citizens, including women, to enable them to register grievances on infrastructure subprojects and/or service delivery performance. Finally, implementing agencies will be required to improve access to information for all citizens, by regularly updating websites to disseminate information concerning development plans, progress, and include links to the GRMs.

F. Gender

69. **Considerations on bridging the gender gap.** Global evidence suggests that women working in SWM often have low skills and education, limited earnings, and may be exposed to risks including health hazards and risks of harassment.[26] During preparation, two major gender gaps were identified: First, working conditions and livelihood improvement prospects for women workers need to be improved. While economic participation of women in urban areas is low in Pakistan, including Karachi, a significant number of women—reported to be around 20 percent of workforce by DMC Korangi—are employed as sanitary workers by DMCs. However, women are generally restricted to labor-intensive or informal roles in the SWM value chain and have limited opportunities for skill development or livelihood improvement. Second, while women as primary care givers and homemakers, are more likely to handle collecting and disposing of household waste, design of waste management services and infrastructure may not respond to their needs, as they are not adequately represented in consultations and decision-making forums to contribute to design of these facilities.

70. **The Project will respond to identified gender gaps by removing constraints for more and better jobs**. A baseline assessment on gender inclusion will be conducted in the first year of implementation, focusing on: (i) number of women engaged in the SWM value chain; (ii) existing working conditions, income levels and skills; and (iii) opportunities for women to improve skills and livelihoods. Based on recommendations from the assessment, the Project will support measures to encourage women to engage in Project activities, where facilities such as separate toilets and a harassment free environment are provided. For female workers in the informal sector, the Project will partner with NGOs to enhance women's skills and improve their access to employment in the formal sector or income generation activities in alternate sectors. Also, enhancing women's voice and agency is critical as women play the primary role in dealing with household waste. Community consultations during design of subprojects will ensure representation of women and collect their inputs concerning design features for collection infrastructure, such as preferred locations and proper lighting to facilitate access. Similarly, communication activities aiming to discourage residents from disposing waste in *nullah* would be designed to specifically target women as well as men, including outreach activities to provide women with information on proximate collection points and means of disposal such as waste bags. Also, Grievance Redressal Committees established under the Project will have designated female representatives from communities. Further, harassment and gender-based violence (GBV) risks will be addressed through appropriate actions such as: adoption of a Code of Conduct for protection against harassment at workplace by the implementing agency and contractors. The Code will be disseminated to employees on subproject sites, and trainings conducted for subproject workers and the local community.

71. **Three results indicators will help monitor progress on gender aspects:** (a) Female workers, in the formal and informal sectors, provided with viable and sustainable opportunities for paid work or skills development training; (b) Female waste pickers with improved working conditions; and (c) Percentage of female beneficiaries satisfied with project-financed infrastructure and services, which directly address constraints and needs identified by women.

G. Climate Change

72. **SWEEP will address present and future climate change risks and impacts—particularly rainfall precipitation and urban flash floods, and extreme temperatures—by introducing adaptation and mitigation measures.** Component 1 directly supports adaptation measures to directly address flooding risks before the 2020 monsoon. These risks are rising which is due to changing monsoon patterns from climate change, as experienced in record-breaking August 2020 rains. Other activities will also bring adaptation benefits and contribute to improved flood management in the city – the clogging of drainage system is expected to reduce due to a higher waste collection rate. Similarly, the design of infrastructure under Component 2 will incorporate adaptation and mitigation considerations. Specifically, for landfills, adaptation measures will include climate risk studies for prospective sites and incorporation of climate adaptive design specifications to enhance resilience to increasingly severe climactic events, as well as training of SSWMB officials and

[26] GA Circular, 2019. The Role of Gender in Waste Management, Gender Perspectives on Waste in India, Indonesia, the Philippines and Vietnam

staff to better plan for and manage such risks during operation of facilities. Additionally, reduction of greenhouse gas emissions is expected from: (a) rehabilitation of open dumpsites and proper treatment in lieu of open dumping and burning; (b) methane capture in landfill facilities; and (c) energy efficiency improvements in waste management services, such as installation of solar or landfill-gas powered lighting and more fuel efficient equipment to replace the aged diesel fleet being used for waste collection. SWEEP is expected to reduce annual greenhouse gas (GHG) emission by 1,247,757 $t_{eq}CO_2$ through improved SWM systems and landfill fugitive emissions capture (see Annex 6 on GHG accounting).

V. GRIEVANCE REDRESS SERVICES

73. Communities and individuals who believe that they are adversely affected by a World Bank (WB) 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), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

74. The overall risk to achieving the PDO is rated **Substantial**. Key risks and mitigation measures are discussed below.

75. **Political and governance risk is Substantial.** The Project will be implemented in a complex political context with multiple actors at various tiers of government. Fragmented urban governance is a pervasive challenge in the SWM sector, and the mandate for service provision has been actively contested. In view of the recent flooding and COVID-19 crises, political pressures will likely be high. These risks will be managed by continuing extensive, regular and collaborative engagement with stakeholders in Karachi, including the GoS and LCs, who have shown strong ownership of Bank-financed projects in Karachi and are primary beneficiaries of urban sector operations, such as CLICK. Additionally, the Project Steering Committee will institutionalize this engagement forming a critical step in mitigating this risk.

76. **Macroeconomic risk is Substantial**. Pakistan's macroeconomic risk is high as it emerges from a crisis. The COVID-19 pandemic is projected to impact real economic growth, affect the government's fiscal position, and depress private investment. This poses risks to the government's ability to make allocations under the counterpart financing arrangement and the achievement of outcomes related to improving participation of private sector providers at key points in the SWM value chain. At the country level, the risk will be mitigated by the government's monetary policy stance geared towards preserving macroeconomic stability and the support from international financial institutions in enhancing Pakistan's fiscal space for COVID-19 response. At the project level, the risk will be mitigated due to the GoS according the highest priority to addressing the pandemic and reprioritizing resources to COVID-19 mitigation measures. Further, the Karachi Transformation Plan announced jointly by the federal and provincial governments in September 2020 identified the SWM sector as a key priority with substantial allocations.

77. **Risks from sector strategies and policies are Substantial.** While GoS has taken steps in recent years to improve SWM in Karachi, the sector faces substantial fragmentation and coordination challenges, and a lack of financial sustainability and low institutional capacity. This policy environment presents a strong challenge to the effectiveness of transformative, policy-level interventions that improve the provision of SWM services. Mitigation will be done by providing comprehensive TA through CLICK project to agencies involved with SWM services in Karachi in tandem with

activities financed under the SWEEP. In parallel to investing in the backbone infrastructure, strengthening the institutional and regulatory capacity of the overall SWM system, at both the provincial and local council levels, will also be a critical step in ensuring success of policy measures that incrementally improve service delivery.

78. **Risks from Technical Design, and from Institutional Capacity for Implementation and Sustainability are Substantial.** SWM infrastructure and systems require operational expertise and financial resources to preserve service levels and prevent breakdowns. SWEEP includes substantial infrastructure investments and the capacity to design, implement and manage these investments will be strengthened, through the use of international consultants at design and supervision stage, engaging technical resources at the PIU to manage the construction phase, and improving knowledge and skillsets of SSWMB staff as well as bringing in private sector to support O&M of infrastructure. As part of a robust mitigation strategy, targeted assistance provided under SWEEP (e.g. in design, procurement, management and operation) to support specific investments in SWM will be complemented by TA and capacity building under CLICK.

79**. Environmental and Social Risk is considered High**. This is driven primarily by environmental and operational and health safety risks linked to emergency works and SWM infrastructure, as well as potential social impacts on informal settlements located at potential sites for the waste transfer and disposal facilities. To mitigate these, retroactive financing will be subject to an environment and social audit and implementation of identified gap filling measures, and SWM infrastructure will be developed through comprehensive screening, E&S assessment, resettlement, and risk management processes. Counterpart capacity will be enhanced through the recruitment of specialists, provision of trainings, and hiring third-party monitoring firms. The project design and implementation arrangements have fully mainstreamed mechanisms for monitoring risks and mitigation actions.

80. **Stakeholders risk is considered Substantial.** Karachi has a variety of ethnic, religious and social groups including poor communities or socially disadvantaged groups forming key stakeholders. Several NGOs may also be interested in the implementation of subprojects. A stakeholder engagement strategy will be in place. First, citizen engagement will be embedded with infrastructure investments. Second, systems for grievance and complaints redress will be strengthened. Third, local NGOs will be regularly consulted and engaged. Finally, information on project activities will be regularly disseminated. A dedicated SEP has been prepared and will be followed for adequate consultation and transparency.

81. **All other risks are rated Moderate.**

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Pakistan

Solid Waste Emergency and Efficiency Project

Project Development Objectives(s)

To mitigate the impacts of flooding and COVID-19 emergencies, and to improve solid waste management services in Karachi.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Mitigate impacts of flooding & COVID-19 emergencies, and improve solid waste management services.			
Number of persons for whom flood risks, and exposure to pathogens including COVID-19, was reduced through cleanup of drainage channels (Number)		0.00	100,000.00
Of which Female (Number)		0.00	50,000.00
Number of residents for whom urban living conditions have improved owing to better solid waste management services (Number)		0.00	500,000.00
Of which Female (Number)		0.00	250,000.00
Quantity of solid waste collected from Karachi daily that is safely disposed (Metric ton)		0.00	5,000.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Immediate Emergency Response Interventions				
Waste materials collected from nullahs during pre-monsoon cleaning (Metric ton)		0.00		100,000.00
Length of nullahs cleared under the project (Kilometers)		0.00		100.00
Number of SWM workers provided PPE and training to mitigate COVID-19 transmission risks (Number)		0.00	5,000.00	5,000.00
Development of SWM Backbone Infrastructure				
Available capacity for safe disposal of solid waste collected from the population of Karachi (Metric ton)		0.00		5,000,000.00
Transfer stations improved or rehabilitated (Number)		0.00		3.00
Number of persons served by improved collection infrastructure and equipment (Number)		0.00		100,000.00
Beneficiaries satisfied with improvements in solid waste management services (Percentage)		0.00	50.00	70.00
Female beneficiaries satisfied with project-financed infrastructure and services, which directly address constraints and needs identified by women. (Percentage)		0.00		70.00
Project Management and Implementation Support				
Training provided to SSWMB staff to operate and manage transfer and disposal infrastructure (Number)		0.00		30.00
Contracts concluded for PPP in SWM (Number)		0.00		2.00
Female workers, in the formal and informal		0.00		750.00

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
sectors, provided with viable and sustainable opportunities for paid work or skills development training (Number)				
Female workers with improved working conditions (Number)		0.00		1,000.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Number of persons for whom flood risks, and exposure to pathogens including COVID-19, was reduced through cleanup of drainage channels		N/A	Flooding Statistics; Inundation Reports; Flood Risk Models.	Progress Reports by SSWMB PIU	SSWMB PIU
Of which Female					
Number of residents for whom urban living conditions have improved owing to better solid waste management services		Annual	SWM Sector Plan; Engineering Design Documents; Progress Reports.	Consolidated Progress Report by PIU.	SSWMB PIU

Of which Female					SSWMB PIU
Quantity of solid waste collected from Karachi daily that is safely disposed		Annual	Records from Disposal Facilities.	Aggregate Sum of Annual Tonnage of Waste Disposed at Facilities Developed under the Project	SSWMB PIU

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Waste materials collected from nullahs during pre-monsoon cleaning		One Time Report	Contractor Invoices; Records from Disposal Facilities.	SSWMB PIU Reports	SSWMB PIU
Length of nullahs cleared under the project		One Time Report	SSWMB PIU Report and Contractor Invoices	SSWMB PIU Report	SSWMB PIU
Number of SWM workers provided PPE and training to mitigate COVID-19 transmission risks		Monthly	DMC & Contractor Reports	DMC & Contractors Reports	SSWMB PIU
Available capacity for safe disposal of solid waste collected from the population of Karachi		Annual	PIU Reports; Engineering Designs	PIU Reports	SSWMB PIU

Transfer stations improved or rehabilitated		Annual	PIU Reports, Engineering Designs	PIU Reports	SSWMB PIU
Number of persons served by improved collection infrastructure and equipment		Annual	PIU Reports; DMC Reports; Performance Management System Data.	PIU Reports	SSWMB PIU
Beneficiaries satisfied with improvements in solid waste management services	Percentage of people who express their satisfaction towards improvements of solid waster management services through a	Twice; at mid-term and at completion	Beneficiary feedback survey reports	Beneficiary feedback surveys	SSWMB PIU
Female beneficiaries satisfied with project-financed infrastructure and services, which directly address constraints and needs identified by women.	Percentage of females who express their satisfaction that improved SWM infrastructure and services address constraints and needs identified through a beneficiary feedback survey.	One-time	Evaluation survey	Survey instrument.	SSWMB PIU
Training provided to SSWMB staff to operate and manage transfer and disposal infrastructure		Annual	SSWMB PIU Reports; Training Records.	SSWMB PIU Reports	SSWMB PIU
Contracts concluded for PPP in SWM	Cumulative number of contracts that were	Annual	Progress reports from	Monitoring of project activities	SSWMB PIU

	concluded by engaging a private sector in construction or operation and maintenance of any segment of solid waste services including collection, transfer, recycling and disposal system under the project.		PIU and contract documents		
Female workers, in the formal and informal sectors, provided with viable and sustainable opportunities for paid work or skills development training	Targets for skill development training assume that the average number of training sessions to be provided per year is 5, and anticipated number of participants to each session is 20. In addition support to improve or rehabilitate livelihoods will account for market access, grants, or alternate income generation options.	Annual	Consolidated Training Reports	PIU reports	SSWMB PIU
Female workers with improved working conditions	Cumulative number of female workers that claim they have improved working conditions	Annual	Progress reports from PIU	Monitoring of implementation of resettlement action plan and livelihood restoration measures, and surveys	SSWMB PIU

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ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Pakistan
Solid Waste Emergency and Efficiency Project

1. Table 1.1 below summarizes Project components, allocations, and implementing agencies.

Table-1.1: Project Implementing Agencies and Component Allocations

Project Components	Implementing Agencies	Allocation (US$ million)
Component 1: Immediate Emergency Response Interventions	SSWMB's SWEEP PIU	**11**
1.1. Cleaning of *nullahs* and disposal of waste		10
1.2. Communication and Outreach Activities		1
Component 2: Development of SWM Backbone Infrastructure		**84**
2.1. Collection Equipment for Under-served Districts and Improvement of *Kachra Kundis*		10
2.2. Construction of new sanitary disposal cell at Jam Chakro Dumpsite		20
2.3. Construction/ Upgrading of Transfer Stations		20
2.4. Development of Long-Term Waste Solutions for Karachi		34
Component 3: Project Management and Implementation Support		**5**
Grand Total		**100**

2. **Operations Manual:** The Project will be implemented per an Operations Manual, which describes implementation aspects, including, among others: criteria for selection and appraisal of subprojects in line with the framework approach, and reference to social and environmental safeguards; subproject procurement and contract management procedures; and other operational details. The manual, including any revisions therein during implementation, must be acceptable to the Bank. SSWMB will develop and adopt the manual within two months of effectiveness after clearance from the Bank.

Financial Management and Disbursement

3. **FM Staffing.** SSWMB's PIU, with support from SSWMB FM team, will be responsible for implementation of SWEEP's FM arrangements. FM staff will be recruited to enhance existing SSWMB capacity.

4. **Budgeting, Planning, and Variance Analysis.** Project's budget will be reflected in the GoS's ADP. The operational/ technical team will provide estimates for annual work plan with quarterly break up of planned activities and associated costs. On a quarterly basis, variance analysis will be conducted for planned activities and their associated costs.

5. **Funds Flow and Disbursement Arrangements.** Funds will be disbursed into a separate DA operated by the SSWMB PIU at the National Bank of Pakistan in line with "Revised Accounting Procedure for Revolving Fund Account (Foreign Aid Assignment Account)" dated October 12, 2020 by the Finance Division. Disbursements will be report-based with advance per six months forecast and documentation of expenditures per bi-annual IUFRs.

6. **Retroactive Financing up to the amount specified in the loan agreement is allowed from January 1, 2020.** Retroactive financing for procurable items is only allowed if items are procured in accordance with processes acceptable to the Bank. A guidance note shared with the PD SWEEP provides main principles; considerations on eligibility of expenditures; potential retroactive financing activities and implementation arrangements; roles/responsibilities of SSWMB and PIU for use of funds; applicable governance framework; and fiduciary requirements (including audit). The PD SWEEP will make available all documents to facilitate audit/reviews by the Bank and AGP (for external audit) and separate audit, if required.

7. **Internal controls.** Relevant GoS' rules and regulations—including Sindh Financial Rules, Accounting Policies and Procedures Manual, and SSWMB Act, 2014—will serve as internal control environment for SWEEP, and include a comprehensive set of preventive, corrective, and detective internal controls for processes and transactions.

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8. **Accounting and Reporting.** Separate books of accounts will be prepared based on country accounting procedures and policies defined in New Accounting Model and Financial Management Manual. Biannual IUFRs will be prepared to report use of funds according to the defined expenditure under Project components and will be submitted to the Bank within 45 days of the close of each semester. Annual Financial Statements will be prepared in accordance with Cash Basis IPSAS and will be submitted to external auditors.

9. **External Audit**. AGP will conduct annual audit of the Project's annual financial statements. For each financial year, acceptable audited financial statements will be submitted to the Bank by December 31.

Procurement

10. Major packages identified under Components 2 and 3 include:

Table-1.2: Procurement Packages

	Description	Category	Estimated Cost (US$)	Bank Oversight	Market Approach	Selection Method	Evaluation Method
Consulting Firms (major contract)							
1	Design and supervision of new landfill cell at Jam Chakro	Moderate	600,000	Post	Open competition	Quality Cost Based Selection (QCBS)	Best evaluated proposal
2	Preparation of ESIA and RP at Jam Chakro	Moderate	200,000	Post	Open competition	Consultants Qualification (CQS)	Most qualified firm
3	Design and supervision of the landfill site at Dhabeji	Moderate	600,000	Post	Open competition	QCBS	Best evaluated proposal
4	Preparation of ESIA and RP at Dhabeji	Moderate	200,000	Post	Open competition	CQS	Most qualified firm
Works							
5	Improvement and Construction of sanitary engineered landfill site at Jam Chakro	Moderate	20,000,000	Prior	Open - international	Request for BID (RFB)	Single Stage one Envelope
6	Improvement and Construction of landfill site at Dhabeji	Moderate	20,000,000	Prior	Open - international	RFB	Single Stage One Envelope
Goods							
7	Purchase of necessary equipment/ machinery/vehicles for waste collection	Moderate	5,000,000	Prior	Open international	RFB	Single Stage One Envelope

11. With the following mitigation measures, the Project's procurement risk rating is Moderate

Table-1.3: Procurement Risk Mitigation

	Risk Area	Mitigation measure	Responsible	Timeline
1	Procurement processes & decision making	i. Major procurement activities have been identified ii. Consulting firm hired to support in procurement of works and goods contracts iii. PD has been delegated execution powers iv. Additional procurement & contract management staff hired at PIU. v. PIU staff trained in Bank procurement procedures.	i. PIU ii. PIU iii. LGD iv. PIU v. WB	i. Indicated in PP ii. March 2021 iii. Done iv. February 2021 v. After hiring
2	Market response	i. PIU to solicit participation from prospective firms for landfill sites. ii. Packages for goods are made aligned with market readiness.	PIU	i. February 2021 ii. Ongoing
3	Design & cost estimation	Consulting firms will be hired for design, costing, procurement support and supervision of the main landfill and smaller contracts	PIU	EOIs published by February 2021
4.	Contract management	i. Contract management plans prepared and regularly monitored for main contracts including monitoring of staff deployment and contractor's presence on site. ii. Contract Manager to monitor implementation of consultancy firm(s) contracts.	PIU/ Consulting firm PIU	After award After award
5.	Implementation delays	i. Disbursement profile will be aligned with the planned procurements ii.The awarded emergency contracts will be reviewed for possible retroactive funding	PIU/WB WB	Ongoing After approval

ANNEX 2: Detailed Project Description

COUNTRY: Pakistan
Solid Waste Emergency and Efficiency Project

Component 1: Immediate Emergency Response Interventions (US$ 11 million; WB financing: US$11 million)

1. Interventions under the emergency component will aim at mitigating high risks from flooding during the 2020 monsoon. The component will include financing for labor intensive emergency works, through which the GoS will generate employment opportunities that are a critical to the COVID-19 emergency economic recovery plan.

Subcomponent 1.1: Cleaning of nullahs and disposal of waste (US$10 million)

2. This subcomponent will support, among others:

(i) *Cleaning of nullahs by removing waste obstructing the flow of water and restoring their drainage capacity*. The primary drainage system of Karachi consists of around 40 *nullahs*, which are obstructed by the accumulation of sediments and waste, considerably reducing hydraulic capacity. With the predicted increases in monsoon rain intensity due to climate change,[27] the vulnerability of the whole *nullah* system to floods has amplified. The cleaning of *nullahs* will be managed by the SSWMB's SWEEP PIU and executed by private contractors adequately trained and equipped for such work[28] and carried out according to strict technical protocols developed for this Project, and adapted from procedures of the KMC. Machinery will be used when possible, but in many places access to *nullahs* is hindered by dense construction or narrow structures, therefore requiring manual removal. By financing such labor-intensive public works, the proposed Project will not only address the flooding risk and enhance resilience towards erratic precipitation patterns driven by climate change, but also generate temporary jobs for skilled and low-skilled workers, which will support local COVID-19 economic recovery efforts of the GoS.

(ii) *Construction of a temporary storage cell for waste and sediments cleared from nullahs* at the Jam Chakro dumpsite[29], where waste cleared from *nullahs* will be temporarily stored for a period of around 12 months, before it is transferred to the new sanitary disposal cell constructed at Jam Chakro (Subcomponent 2.2). The temporary storage cell is required to be available prior to the *nullah* cleaning work, to ensure safe disposal of waste extracted from the *nullahs.*[30] The SSWMB is responsible for operation of the temporary cell.

Subcomponent 1.2: Communication and Outreach Activities (US$1 million)

3. The proposed Project will finance the development and implementation of a targeted communication and awareness campaign aimed at communities living around the *nullahs*. These activities are intended to promote better solid waste management practices, encourage residents to limit dumping of household waste into *nullahs*, and disseminate information about the nearest designated collection locations to communities in the Project area, particularly women. The campaign will also highlight efforts by the LGD, KMC and SSWMB to mitigate risks associated with the upcoming monsoon by cleaning of *nullahs*, restoring drainage capacity and ensuring waste disposal. This will contribute to building trust with the public in service provision capacity of local agencies, and to creating ownership towards the Project.

[27] Farhan Anwar, Karachi City Climate Change Adaptation Strategy, Friedrich-Naumann-Stiftung für die Freiheit Report, 2012.
[28] Workers will be trained and adequately equipped to avoid additional risks resulting from exposure to COVID-19.
[29] A dedicated location separated from the day-to-day activities at Jam Chakro will be selected for the construction of the temporary storage and dewatering cell. Access to the cell will be controlled. The cell will be built following international standards, with appropriate lining and dewatering provisions.
[30] The cleaning of nullahs and transfer of waste will be performed in accordance with an ESMP.

4. Activities under Component 1 will be initially financed by the GoS. Project funds will be used to retroactively reimburse these expenditures after Project effectiveness, subject to the implementation of these activities in accordance with the World Bank's fiduciary, environment, and social management requirements.

Component 2: Development of SWM Backbone Infrastructure (Total cost: US$84 million; WB financing: US$84 million)

5. SWEEP will finance core investments in infrastructure, along the SWM value chain, to provide end-to-end solutions to the management of solid waste in the short- to medium-term. The proposed Project will build on institutional strengthening and TA activities provided under CLICK to support the development of environmentally, socially, and financially sustainable alternatives for Karachi, bringing in public and private sector stakeholders. The modernization of the SWM system will be achieved through a series of incremental improvements, as described below:

Subcomponent 2.1: Urgent Collection Equipment for Under-served Districts and Improvement of Kachra Kundis (WB financing: US$10 million)

6. *Provision of Equipment:* The proposed Project will support the provision of critical equipment to improve occupational safety and collection efficiency, specifically to the three DMCs currently managing waste under public arrangement. Equipment will include, inter alia: (a) PPE and light equipment for workers; (b) collection trucks; and (c) bins and containers to improve collection efficiency and properly service the network of *kachra kundis*. The equipment procurement will be complemented by a focus on: (a) assuring an operational model is in place to manage and maintain the equipment; and (b) assuring mechanisms are in place to fund the operation and servicing of the equipment. Equipment will also be acquired by the SSWMB to improve associated operations (such as transfer sites). Contracts for procurement of equipment will include a stock of spare parts, training of mechanics at each depot, and an adequate maintenance and service period.

7. *Improvement of Kachra Kundis:* The Project will finance the upgrading of up to 30 existing *kachra kundis*, and the construction of approximately 50 new points at appropriate locations to improve waste collection services. The location of interventions will be planned based on need and consultations with nearby residents, ensuring representation of women, particularly in underserviced and flood-prone areas, to prevent illegal dumping in the *nullahs*. The designs of *kachra kundis* will be customized to each location to maximize operability by private contractors or DMCs.

Subcomponent 2.2: Construction of new sanitary disposal cell at Jam Chakro Dumpsite (WB financing: US$ 20 million)

8. This subcomponent will support, among others, the construction of a new sanitary landfill cell within the Jam Chakro dumpsite, improved safety measures for the dumpsite, rehabilitation of areas that have reached capacity, and improved living conditions and livelihoods for the community of waste pickers residing within the dumpsite. Specifically, the subcomponent will finance the following:

(a) *Design and construction of a new landfill cell* on underutilized available land within the perimeter of the Jam Chakro dumpsite.[31] The new landfill cell will provide Karachi with modern disposal capacity for the next three to four years, based on current incoming volumes.
(b) *Design and construction of a manual Material Recovery Facility (MRF),* adjacent to the disposal cell, intended to provide safe working conditions and income to waste pickers working at the dumpsite.
(c) *Measures to improve safety and environmental performance of the dumpsite,* including, among others: (a) construction of a perimeter fence/wall to limit intrusion and restrict waste deposits within site limits; (b) stabilization

[31] The land where the Jam Chakro dumpsite is located is owned by the GoS.

of areas at risk of collapse by regrading unstable slopes; (c) retrofitting access gate, weighbridge and offices for better control of incoming flows; (d) construction of test wells to monitor potential groundwater contamination; and (e) fire extinction activities to stop constant burning and reignition through covering or cooling.

(d) *Progressive closure and rehabilitation*[32] *of areas that have reached capacity*, through standard methods to progressively reduce impacts associated with the operation of Jam Chakro.

(e) *Community Support Plan for waste pickers living at Jam Chakro.* There is a settlement of roughly 400 households living within the dumpsite and earning livelihood from scavenging activities. In the immediate instance, the Project will aim to improve occupational safety as well as living conditions, starting with safe and efficient sorting conditions, such as those that will be provided at the MRF. In the medium- to long-term, a resettlement and/or livelihoods restoration plan for the community will be developed and implemented. These interventions will ensure that specific needs of women within the communities and livelihoods for females are fully represented.

Subcomponent 2.3: Construction/ Upgrading of Transfer Stations (WB financing: US$20 million)

9. The proposed Project will finance the construction or upgrading of up to four modern transfer stations. The SSWMB currently operates ten basic transfer sites. The current network of transfer sites is insufficient, entailing illegal dumping in the *nullahs* as well as large accumulations of waste across the city. The construction of additional transfer capacity is essential to improve the efficiency of the overall system including costs, environmental and social impacts, and general quality of service. The number and location of transfer stations will be determined based on the Integrated Karachi SWM Strategy and on land availability (a number of possible sites have already been identified by the SSWMB). The Project will support the development and implementation of an appropriate operating model for the operation and maintenance of these sites, likely with private sector participation.

Subcomponent 2.4: Development of Long-Term Waste Solutions for Karachi (WB financing: US$34 million)

10. The Project will support the development of long-term waste solutions for Karachi, which address the limited capacity remaining at existing disposal sites. The Project may consider multiple operating models making use of project financing, private capital, or public private partnerships. A top priority will be the construction of a new sanitary landfill for Karachi. The GoS has designated a 3,000-acre site in Dhabeji, about 60 kilometers east of Karachi, for the development of an integrated waste treatment facility. The Project will finance the planning, design, and construction of a modern facility, co-located with adjacent activities to sort, process, and extract value from the waste.

11. In addition to constructing the landfill, the Project will provide support—including planning, feasibility studies, climate-resilient engineering designs, development of business and operating models, and advisory services—for the preparation of a larger ecosystem of waste treatment solutions. These solutions will aim to maximize waste volumes to be reused or recycled, generate energy from specific waste streams, while preparing the remaining fraction for final disposal at the landfill. The development of this ecosystem will require a combination of private and public investments. The Project may support the design and construction of solutions to improve treatment of non-municipal waste streams such as medical waste and/or construction and demolition (C&D) waste by supporting, among others: (a) assessment of existing systems for collection, transport and disposal of medical and C&D waste streams; (b) identification of gaps to be addressed through investments in technologies and management modalities; (c) development of service improvement plans needed to build end-to-end solutions for each stream, and policy recommendations on regulation and tariffs for

[32] Rehabilitation options for dumpsite areas will be evaluated and designed on a case-by-case basis, and will include measures ranging from stabilization and capping, to closure and long-term monitoring. Potential disruption of livelihoods for active waste pickers will be considered when assessing feasibility of rehabilitation alternatives.

generators; and (d) identification of priority investments, including climate-friendly technical specifications for transport, treatment and disposal solutions, optimal locations for facilities, contractual arrangements, and so forth. Operating models for such investments will also on private sector participation for provision of services and O&M of assets.

Component 3: Project Management and Implementation Support (Total cost: US$10 million; WB financing: US$5 million)

12. This component will support implementing agencies, primarily the PIU under the SSWMB, to manage and implement activities and investments under SWEEP. The component will support skillsets and resources to manage the PIU's workload and associated expenses related to managing procurements, contract supervision, and oversight of infrastructure investments. Further, the component will finance consultancies for environment and social assessments and instruments, monitoring implementation of safeguards plans, tracking and delivering gender-related outcomes, and resettlement aspects. Other consultants for feasibility studies, engineering design and supervision, and contractors for infrastructure works will be financed under Component 2. In addition, the component will finance interventions such as trainings and skill development in the areas of monitoring and evaluation, communication, audits, social and environmental management, engineering, operations and maintenance, and project management. The component will cover costs related to skilling and capacity building requirements of SSWMB's staff and engineers, related to operations and maintenance of infrastructure commissioned under SWEEP, per international standards and design specifications. GoS's financing under the component will be used for salaries for civil servants posted in the PIU, and compensation for resettlement impacts related to civil works.

ANNEX 3: Economic Analysis

COUNTRY: Pakistan

Solid Waste Emergency and Efficiency Project

1. **The economic analysis aims to identify and quantify price distortions that affect the operating expenditures as well as the investments.** Evaluation of these distortions makes it possible to rectify financial prices and obtain economic prices. Corrected structure of economic prices allowed estimating of revaluation coefficients. Conversion of financial costs into economic costs is essential to reflect the value of the output for community. The objective of this calculation is to determine the opportunity costs of both inputs and outputs. As taxes, duties, and subsidies, such as for electricity, constitute internal flows in the national economy, these were not considered in calculation of economic costs.

2. **Labor.** Wages applied for unqualified skills is the minimum wage without social contribution. For skilled job salaries, conversion factor is taken as 1 but social contributions not considered, and labor assumed to be locally hired.

3. **The economic analysis was performed for flooding risk mitigation through SWM infrastructure investments in urban Karachi.** The analysis covers recurrent annual flooding during monsoon based on hydraulic modelling. Average annual flooding disruption is 8 days. Total cost of SWM investment amounts to US$ 87.50 million.

Table 3.1: Economic cost of investment and maintenance costs (in PKR billion)

	Area	Population	Financial Investment	OMex	Shadow Conversion Cost	Economic Value
	Ha	*'000*	*PKR Billion*	*% invest*		*PKR Billion*
	800	541.6	14.00	5%	0.9	12.60
Total	**800**	**541.6**	**14.00**			**12.60**

4. Several socioeconomic and environmental benefits could not be valued due to non-available data.

- *Health:* averted in terms of death, drowning, injuries, water-related/vector-borne diseases
- *Environmental:* ecological system disruption, water pollution, air pollution due to traffic jams, land degradation
- *Global externalities:* carbon emission (e.g. due to traffic jams, methane emissions from dumpsites, etc.)
- *Damages:* infrastructure (transport, energy, water, etc.), land, household, business, private property/assets, etc.
- *Economic opportunity:* loss of economic opportunities and increase of poverty incidence and vulnerability
- *Social:* disruption of health services, schools, universities, etc.

5. The economic analysis covers disruption days from floods in targeted areas. The Project provides social benefits: value added of land in Project areas without disruptive flooding, and eight days of avoided floods per year illustrated by gross national income per capita. Retained methods to derive social benefits for economic analysis are: (a) averted loss of opportunities by reducing eight disruptive severe-flood-days per year; (b) hedonic pricing for incremental value of land associated with reduction of severe-flood-days; and (c) shadow price of carbon (SPC) per World Bank guidelines.

6. Several key assumptions have been considered for the economic analysis:

- The exchange rate used is US$1 = PKR 160. The works will target the six districts of Karachi
- The economic analysis is carried out over a 20-year period, assuming no investment in new assets is needed. A real discount rate of 5 percent per annum is used. Value-added Tax (VAT) is 17 percent, applicable to all costs.
- The overall standard conversion factor (SCF) for adjusting market prices to shadow prices is set at 0.9. The shadow exchange rate is 1.0. The shadow wage is 1.0 as most labor needed for the Project will be locally hired.
- Investments are disbursed over 5 years of the implementation of the Project (see Table 3.1).
- OMex cost is on average set at 5 percent during project implementation and afterwards.
- The lost opportunity of eight disruptive days. Improved SWM should help targeted areas avoid major disruptive

floods. Gross National Income/capita/year adopted is PKR 171,829 in 2018 with annual growth of 2.2 percent.[33]

- SPC set per World Bank Guidance Note on shadow price of carbon in economic analysis.[34]
- Hedonic method to derive incremental cost of land. Land price used from government update of prices in 2018.
- All benefits assumed to accrue in 2022. Land price increase assumed to accrue after 3 years with equal increments.

Hedonic Pricing Methodology

7. Price of land was obtained from the Statutory Regulatory Order No. 837-2019[35] of July 23, 2019, pursuant to revision of value of immoveable properties in Karachi. The SRO fixes the average cost of residential land at PKR 19,018 / sq. yard for open plot and PKR 24,045 per square yard for built up property. Land price was estimated at PKR 28,762 per m^2, structural attributes not considered, environmental attributes include flood-prone areas derived from Wang et al. (2009) and population density from KTS 2016. Hence, land price a flood-prone area is estimated to decrease by 33 percent. Based on the hydraulic model presented in Annex 4, flooding will reduce by 30 percent in project area where a total surface of 8,000,000 m^2 is prone to flooding. The corresponding total land price increment amounts to PKR 23.01 billion (US$ 143.81 million), accruing between 2023 and 2026 (5-year price adjustments).[36]

Shadow Price of Carbon

8. The project results in GHG emissions reduction of 1.25 million $t_{eq}CO_2$ per year on average, for a total of 28 million $t_{eq}CO_2$ over the entire lifespan. Per the guidance note, carbon externalities are incorporated in the economic analysis based on the GHG accounting presented in Annex 6. Carbon prices are drawn from the guidance, including low-cost and high-cost scenarios from 2020 to 2040, which show high benefits – US$795 million and US$1.64 billion respectively.

Economic Analysis Results

9. Economic Indicators with 5 percent Discount Rate without SPC are presented in Table 3.2. Results show the Project is economically viable without SPC. Table 3.3 and 3.4 present low carbon price and high carbon price scenarios respectively with IRR raised from 20 percent (base case) to 52 percent (low carbon price) and 58 percent (high carbon price).

Table 3.2: Economic Indicators with 5% Discount Rate without SPC

Key economic indicator	Results	Interpretation
Project Level		
NPV/20 years	US$ 39.46 million	Net benefit exceed cost
IRR/20 years (5%)	20%	Positive and greater than 5%
PV Benefit/Cost Ratio/20 years	1.51	Discounted benefit > discounted cost

Table 3.3: Economic Indicators with 5% Discount Rate with low SPC

Key economic indicator	Results	Interpretation
Project Level		
NPV/20 years	US$ 835 million	Net benefit exceed cost
IRR/20 years (5%)	52%	Positive and greater than 5%
PV Benefit/Cost Ratio/20 years	7.5	Discounted benefit > discounted cost

Table 3.4: Economic Indicators with 5% Discount Rate with high SPC

Key economic indicator	Results	Interpretation
Project Level		
NPV/20 years	US$ 1684 million	Net benefit exceed cost
IRR/20 years (5%)	58%	Positive and greater than 5%
PV Benefit/Cost Ratio/20 years	10.85	Discounted benefit > discounted cost

[33] Average growth observed over the 2008-2018 period
[34] *http://pubdocs.worldbank.org/en/911381516303509*4 98/2017-Shadow-Price-of-Carbon-Guidance-Note-FINAL-CLEARED.pdf
[35] www.fbr.gov.pk/valuation-immovable-propertie
[36] Flood modelling conducted showed that impact of floods would reduce by 30 percent over the 8,000,000 m^2 currently affected by floods.

ANNEX 4: Assessment of Flooding Risks in Karachi

COUNTRY: Pakistan
Solid Waste Emergency and Efficiency Project

1. An assessment of baseline flooding risks in Karachi and potential savings on offer through clearing solid waste from the *nullahs* was undertaken by the Bank. The assessment uses a HEC-RAS hydraulic model, which covers the two major rivers and the 40 main *nullahs* in Karachi.

2. The scenarios modelled include: a) a baseline scenario estimating inundation and damages with reduced conveyance capacity of drains; and, b) an improved scenario reflecting a reasonably free flowing *nullah* system with no blockages, to identify the impact of solid waste and debris blocking the channels. The metrics include number of buildings flooded and depth of inundation and will generate a generic vulnerability equation using regional data to calculate a first order estimate of damages and potential reductions from *nullah* clearing.

3. The baseline scenario estimates flood related damages of various extents to 270,000 buildings in various parts of Karachi, which would show a population around 1.5 million residents in Karachi being impacted by floods in terms of material damages to properties, restricted access during flooding days, and related economic and livelihoods impacts. Potential benefits from *nullah* clearing are estimated to be significant with annual average damage (AAD) due to flooding being reduced by more than 30 percent.

4. Table 4.1 presents modelling results and estimated damages, with and without clearing of waste from *nullahs*, for various return periods.

Table 4.1. Risk assessment modelling results

	Buildings Affected (>0.2 m depth)			Damages (US$ millions)		
Return Periods	***Clear Nullahs***	***Blocked Nullahs***	***Diff.***	***Clear Nullahs***	***Blocked Nullahs***	***Diff.***
5yr	35,112	48,732	13,620	44.9	82.9	38
20yr	79,181	89,458	10,277	141.8	191.7	49.9
100yr	111,626	120,424	8,798	244.4	297.8	53.4
200yr	142,166	151,693	9,527	368.1	431	62.9

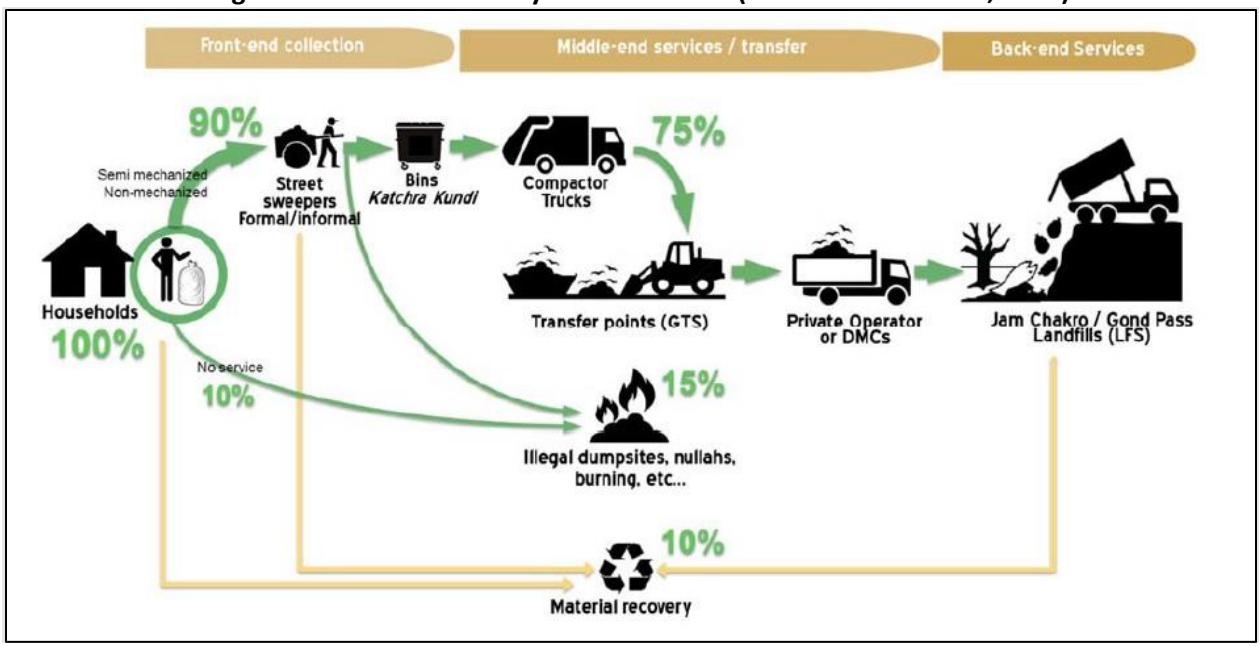
ANNEX 5: The Solid Waste Management Sector in Karachi

COUNTRY: Pakistan
Solid Waste Emergency and Efficiency Project

Sector Overview

1. The SWM sector in Karachi is divided into three operational segments: front-end collection, middle-end services and back-end services, managing more than 12,000 metric tons of municipal solid waste every day (see Figure 5.1). The sector's infrastructure consists of two dumpsites, Gond Pass and Jam Chakro, located approximately 30 kilometers west and north-west from the city center, and ten transfer sites located around the city. Existing infrastructure is insufficient to serve Karachi and over time alternative solutions need to be identified to enable the city to manage solid waste.

Figure 5.1: Current SWM system in Karachi (Source: World Bank, 2018)



Institutional structure:

2. The institutional structure of the SWM sector is fragmented. Key institutions include the SSWMB as the primary service delivery agency within the sector, and DMCs which have a more limited role. SSWMB was formed in 2014 under an Act of the provincial assembly. The Board is empowered to manage solid waste issues for Sindh as a whole, and has the right to recommend a cess, tariff, or other charge to the government for the management of solid waste; to construct and manage sites and buildings for solid waste management and disposal; and to make rules and regulations for the same etc. The Board is also empowered to manage a Fund, known as the Sindh Solid Waste Management Fund, in which charges, rates, and fees may be deposited; in addition to other grants and loans made to the Board.

3. Front-end collection services, which involve collection of solid waste from primary collection points (bins or *kachra kundis*) and moving it to designated transfer stations, are divided between the SSWMB which provides services in three of the six districts, and DMCs for the remaining three districts. SSWMB and DMCs are also using different operational models. DMCs provide these services using sanitary staff who are regular employees of the DMC, and equipment that is DMC-owned and operated. In contrast, the SSWMB uses a private-sector led model through front-end collection contracts. The SSWMB has sole responsibility for the remaining segments of the value chain till disposal for the entire city, and O&M infrastructure such as transfer stations and the disposal sites, and manages these functions through contracting arrangements with the private sector as well.

Financial Sustainability

4. Despite the SSWMB's primary role, financing and staffing needs are not fully met, with SSWMB receiving only half of its budgeted financing for operations. Financial sustainability of the sector is fragile, due to absence of dedicated resources and relatively high costs paid to private operators for waste collection (around US$30 per ton) which is financed fully by transfers from GoS. The financial situation of DMCs is even worse due to chronic lack of funds for service delivery.

5. The lack of financial sustainability is a key impediment for the sector to develop, and service delivery in the sector is reliant on outlays from GoS. Development of revenues and cost-recovery in the provision of services is required to address this challenge. TA under CLICK intends to support the development of revenue streams. Willingness-to-pay studies, and an assessment of service delivery needs and provisions across different localities will identify specific sites or professional groups that may be focused upon. These may initially include high-income areas, private developers, commercial areas, traders and corporate entities who are willing to pay fees—and in most cases are already paying fees to informal workers—for a defined level of service. Second, while SSWMB is mandated to recommend tariffs to the GoS, it is important to improve services to induce people to pay and invest in improving backbone infrastructure, which may in turn allow leveraging of private investments in specific areas along the waste value chain. Therefore, initial investments in critical infrastructure and services is the key to unlock the trajectory towards greater financial sustainability.

Collection

6. The introduction of private operators for primary waste collection in three out of six districts of Karachi has improved service delivery. Major steps are still to be taken on collection point management, uncollected construction and debris waste, illegal dumping and relationship with the informal recycling sector. The current situation has a major adverse impact on health, drainage, and degradation of the urban environment. CLICK is providing support to improve outsourcing to private sector by strengthening the capacity of the SSWMB to oversee delivery on contracts. However, there are significant gaps in availability and coverage of collections infrastructure and equipment across Karachi, particularly in areas where DMCs are providing collection services and low-income areas or *katchi abadies*.

Transfer Capacity

7. Existing waste transfer capacity is below requirements and does not allow for full coverage, resulting in massive waste dumping across the city. The situation at existing transfer stations poses significant health and safety risks. Transfer stations are operating in a suboptimal manner, are poorly designed, and their operation impedes efficiency of the entire value chain. The sites impact the urban environment and social acceptability of waste management activities. Review of capacity, use and operations of transfer stations will help identify efficiency gains and opportunities for improvement.

Treatment and Landfills

8. Existing landfills have reached their maximum capacity and have transformed into dumpsites. The sites do not meet environmental standards. While CLICK includes activities to support baseline studies for the existing sites, there is a critical need to develop adequate disposal capacity and initiate closure and reclamation of both sites. Over the long term, there are opportunities to leverage advanced waste treatment solutions and the private sector in this area.

Policy framework

9. A broad legal corpus exists at the national and provincial level, and most of the regulatory material is relevant and applicable to the waste sector. The legislation, however, falls short of: (a) technical prescriptions for the design of SWM facilities; (b) financial tools specific to the management of waste in general; (c) waste master planning; (d) waste minimization and diversion policies; and (e) overall surveillance and enforcement. There are opportunities for relative quick wins through TA to address some of these shortfalls. While CLICK provides support to improve the policy environment, these will need to be dovetailed with investments to address key infrastructure gaps and improve services.

Community Engagement

10. Community engagement in the sector is minimal. Behavior change interventions are needed—and included under

CLICK—to raise awareness in the communities, and promote more sustainable behaviors concerning reduction, primary segregation, and household management of waste. However, public perception of the waste sector and safer and responsible behavior concerning solid waste is also dependent upon the quality of services being provided. This will require investment in the sector to address current infrastructure and service delivery gaps.

11. The waste sector also plays a significant role in the city's informal economy and involves marginalized groups. The sector is estimated to employ 15,000 people in the city in waste collection only, and approximately 100,000 in the recycling industry, with a concentration of minorities and informal labor. On the one hand, there is a need to better understand the organization of informal sector, identify opportunities for professionalization to leverage job opportunities, and improve communication about waste management. CLICK will provide TA to SSWMB in these areas. On the other hand, professionalization is also an opportunity for the sector to increase capacity and employment for the wider community. This will address social problems such as unavailability of workers and staff for SWM services due to the negative social perception of the sector. Improved infrastructure and modern operations will contribute to making SWM a legitimate sector for employment and livelihoods.

Data and information gaps

12. Limited information exists on existing operations, waste composition, and location-specific environmental and social implications. CLICK is supporting SSWMB to improve availability and reliability of data for monitoring service delivery and long-term sector planning.

SWM interventions under CLICK

13. The TA component of the CLICK project is financing activities aimed at improving institutional, technical and operational activities grouped in the following thematic areas:

a) **Upstream policy and regulatory development for SWM:** (i) review of existing sector regulations and financial sustainability; identification of cost recovery mechanisms; (ii) development of policies and regulations to help reduce waste leakage especially including plastic waste, and help manage hazardous waste streams; and (iii) identifying options for private financing at critical points in the waste supply chain, to crowd-in private investment in the SWM sector more effectively and strategically.

b) **Institutional capacity strengthening of SSWMB:** (i) acquisition of technology for improved service management; (ii) upgrading of existing M&E and data management and performance management systems; (iii) trainings (formal and on-the-job training) for contract management and for introduction of performance-based contracts for SWM; and (iv) study for the development of a SWM master plan for the Karachi region.

c) **Development of sector strategy to improve efficiency and effectiveness:** (i) economic, environmental and social study of the waste sector in Karachi; (ii) waste characterization, including identification of medical, construction, agriculture and industrial waste; (iii) technical, environmental, and social baseline studies for existing solid waste management infrastructure; (iv) preparation of strategy and roadmap for the development of additional transfer and advanced treatment capacity; (v) mapping of the existing solid waste collection system and collection optimization studies including route optimization; and (vi) study of the informal waste sector, including sorting and recycling practices.

d) **Social sustainability and public awareness:** (i) activities to promote increased community level engagement, public awareness and undertake behavior change campaigns, including implementation of strategy for to engage and mobilize women at the community level, and undertaking a review of regulations for public handling of waste; and (ii) baseline study for community-level job creation in the SWM sector, including identification of steps for the professionalization of the waste sector.

ANNEX 6: Climate Change Considerations and Analysis

Climate and Disaster Risks

1. As mentioned, potential climate risks such as drought, floods, sea level rise, and coastal erosion pose the greatest threats to Karachi. Results from the climate screening exercise have determined that the initial level of exposure the prospective locations of the sanitary landfills and transfer station sites in regard to the climate and geophysical hazards are moderate. Sector specific climate risk management measures will be integrated into the physical investments and soft components of the Project design, to ensure robust and sustainable adaptation and mitigation solutions are adopted.

2. During project implementation, location specific research and analyses including hydrogeological studies and vulnerability mapping will be conducted to strengthen opportunities to enhance climate resilience solutions for infrastructure, as well as early warning systems and emergency recovery plans.

Results

3. The Project will result in a net emissions reduction of 28,092,043 $t_{eq}CO_2$ equivalent to a reduction of 10.3 percent of the sector's emissions over the project lifetime, compared to the baseline scenario. The emissions reduction is primarily driven by the development of modern disposal facilities including landfill gas capture and closure of existing dumpsites, as well as improve fuel efficiency of vehicles from front to back end.

Table 6.1: SWM Sector Emissions over Economic Lifetime of the Project

	2020 (base year)	2022	2025	2040	Total 2020-2040
Total Sector Emissions Baseline Scenario ($t_{eq}CO_2$ /year)	**10,178,180**	**10,789,695**	**11,757,000**	**17,123,992**	**271,833,828**
Project Emissions Reduction ($t_{eq}CO_2$ /year)	**0**	**-703,999**	**1,243,380**	**2,126,232**	**28,092,043**
of which:					
Waste Management	0	-704,737	-560,850	-322,000	- 6,325,000
Waste-to-Energy	0	0	0	0	0
Landfill Fugitive Emission Capture	0	0	1,803,405	2,448,000	34,400,543
Waste Collection and Transfer	0	825	825	825	16,500

Table 6.2: Summary Results

Economic Lifetime (years)	20
Gross Emissions over Economic Lifetime ($t_{eq}CO_2$)	*271,833,828*
Net Emissions Reduction over Economic Lifetime ($t_{eq}CO_2$)	*28,092,043*
Average Annual Emissions Reduction ($t_{eq}CO_2$)	*1,247,757*

`

Analysis Boundary:

a. The analysis boundary for the climate change assessment and GHG accounting estimations cover the Project territory i.e. the city of Karachi
b. Activities analyzed in the Project scenario cover construction of modern landfilling capacity, including gas capture and material recovery facilities
c. Improved efficiency of transportation and routing optimization

Methodology:

a. The Bank's Climate and Disaster Risk Screening Tools and the Climate Change Knowledge Portal were two key resources used to assess the climate vulnerability context of the Project location.
b. The Climate Action for Urban Sustainability's CURB Tool was used to estimate the existing and potential greenhouse gas (GHG) emissions of Waste Disposal within the Project area following the International Panel on Climate Change (IPCC) methodologies.

c. The Institute of Global Environmental Strategies (IGES) GHG Calculator for Solid Waste was used to estimate the GHG emissions reduction based on UNFCC approved methodology (AMS-III.G.: Landfill methane recovery) with respect to the existing technologies within the sector, to assert results over the entire project life span.

Baseline for 2020:

a. The total municipal waste generated yearly is 5,110,000 tons for a population of 16,094,000.
b. It is assumed that:
   - In Karachi, 95 percent of the waste in disposed of in open dumps (designated dumpsites, illegal dumpsites or drainage system) and 5 percent is burnt through open burning;
   - There is no official material recovery and informal recovery occurs at source;
   - All dumpsites, including Jam Chakro and Gond pass, were not designed and are not operated as sanitary landfills and no landfill gas (LFG) collection system in place.
c. The waste composition data was drawn from bibliography, resulting from sampling in 18 locations representative of Karachi's territory. Composition is as follows:

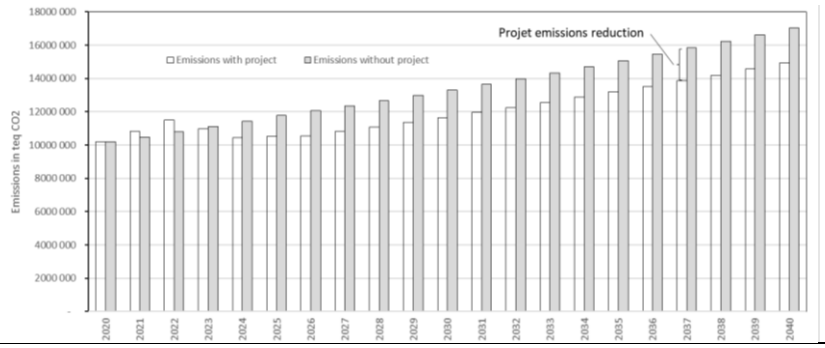
Table 6.3: Municipal waste composition in Karachi[37]

Waste type	*Paper/cardboard*	*Textiles*	*Organic Waste*	*Wood*	*Rubber and leather*	*Plastics*	*Metal*	*Glass*	*Other*
Percentage (by weight)	8.1	7.4	43.6	3.1	2.1	7.9	1.1	5.6	21.0

Project Scenario

The scenario is based on expected sequence of proposed activities, specifically the phased development of modern landfilling facilities and progressive closure of dumpsites:

a. **2020** - Assumed that due to legislation, regulation, sensitization and improved dumpsite operation, burning of waste will cease in the Project area;
b. **2022** - (i) The new sanitary cell at Jam Chakro will be commissioned, including LFG capture and flaring; Saturated areas of dumpsite will be progressively closed and covered. (ii) An additional 5 percent of the municipal waste stream will be diverted from landfills due to improvements at transfer locations, the construction of a new MRF as well as sensitization and professionalization of front-end workers; (iii) Acquisition of modern collection and transportation vehicles for districts operating under public arrangement and collection route optimization will bring a 20 percent reduction in fuel consumption for these districts.
c. **2025** - The new waste management facility will start operating in Dhabeji and former dumpsites are completely closed and covered.



Key Assumptions:

a. The Project is expected to have an economic lifespan of 20 years (2020 to 2040);
b. Landfill gas recovery rate is expected to remain at a minimum of 50% of total waste-related emissions

Data Sources:

- World Bank, Solid Waste Management in Karachi, Sectoral Review. 2018
- World Bank, Competitive and Livable City of Karachi Project, Project documentation. 2019
- Word Bank, Transforming Karachi into a Livable and Competitive Megacity - A City Diagnostic and Transformation Strategy. 2018
- Sindh Solid Waste Management Board

[37] Environmental Impact of Municipal Solid Waste in Karachi City – Shahid and al., World Applied Sciences Journal, 2014