ADB Technical Assistance for Preparing the Sindh Coastal Resilience Sector Project
Terms of Reference

Coastal Resilience Consultant Firm

A. Background and Purpose

1. The Indus Delta comprises about 41,440 square kilometers (km^2) (4,144,000 hectares) area,[1] with an estimated delta length of about 100 kilometers (km). The region has fertile soils from the sediment carried to the region by the Indus River resulting in agricultural development. Development of the Indus Basin Irrigation System (IBIS) in 1970s has significantly reduced the Indus flows in the delta region at downstream of Kotri Barrage. Climate change (sea level rise, more frequent or erratic rainfall and storms) is intensifying the inland and coastal flooding in Indus Delta.

2. The flat topography, poor drainage, and prolonged inundation cause high damage to the infrastructure, loss of property and frequent crop failure. Reduced freshwater supply combined with sea level rise, intruded the saltwater to the adjacent lands and the groundwater aquifer, causing the degradation of land and water quality. The shrinking vegetation cover, declined diversity and reduced palatable grasses, trees, shrubs, and grazing opportunities are often linked with reduced freshwater supply, seawater intrusion and increased soil salinity vis-à-vis over grazing.[2] Low capacity of the communities living there and frequent shocks to livelihood (crop failure, loss of property and health hazards) have placed over 3.5 million people and 22,872 km^2 land in vulnerable conditions in three districts of Badin, Sujawal, and Thatta. The recent pluvial flood of 2022 has caused a loss of around $10 billion to Sindh Province. This, in turn, has caused a severe degradation of the quality of life and livelihoods in already poor socio-economic circumstances: poverty rates are high, education and literacy rates are low, and there is poor access to services and basic amenities.

3. Within the Indus Delta, earlier studies supported by the Asian Development Bank (ADB) identified seven priority flood risk management (FRM) catchments in the Badin, Sajawal, and Thatta districts which require improvement with an integrated flood and erosion risk management approach.[3] Improvement within these FRM catchments will comprise multiple "subprojects" – prospective structural and non-structural investment interventions to enhance resilience. **Table 1** shows the list of the relevant studies which support this approach.

4. The proposed Sindh Coastal Resilient Sector Project will help address these main challenges (see **Section B. The Ensuing Project** below). A grant-financed transaction technical assistance (TRTA) totaling $2 million will prepare the project, financed by the Japan Fund for a Prosperous and Resilient Asia and the Pacific (JFPR) and administered by ADB.[4] Under the TRTA, ADB is recruiting an experienced and qualified consultant firm to support the Government of Sindh to prepare the proposed project.

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[1] A large variation in Indus's delta area (from 29524 km^2 to 41,440 km^2) was reported due to shifting nature of the river. Indus River Delta (accessed 2 August 2022).

[2] Aamir Alamgir, Moazzam Ali Khan, Syed Shahid Shaukat, Jamil Kazmi, Salman Qureshi and Farheen Khanum. 2015. Appraisal of Climate Change Impacts on the Coastal Areas of Sindh Using Remote Sensing Techniques. American-Eurasian J. Agric. & Environ. Sci. IDOSI Publications, 2015. (accessed 10 March 2023)

[3] Resilient Coasts. 2022. *Integrated Flood and Erosion Risk Management (I-FERM) Schemes*. Plymouth. (Available here).

[4] JFPR funding is supplemented with in-kind government contribution.

Table 1. List of Relevant Studies

Studies/Reports/Research papers	Year
Author: Resilient Coasts Ltd: Emma Rendle	
1. An adaptation approach for resilience in the Indus delta catchment	2022
2. A synthesis of lessons learned by World Bank Inspection Panel	2022
3. Realizing the ecosystem services of mangrove forests	2022
Authors: Resilient Coasts Ltd: Emma Rendle, Altaf Siyal, Khadim Soofi	
1. Stakeholder engagement and subproject longlist generation and readiness report	2021
Authors: Landell Mills and Jeremy Benn Associates Ltd (JBA) under ADB TA-9634REG	
1. Strengthening Integrated Flood Risk Management	2020
2. Inundation Modelling and Flood Mapping: Sindh Province, Pakistan	2022
3. Flood Risk Assessment for Sindh Province	2022
4. Extreme Sea Levels: Sindh Province, Pakistan	2021
Authors: Resilient Coasts Ltd: Emma Rendle, Camille Bann and Saleem Ullah	
1. Scoping report - Review and investment plan for the proposed Asian Development Bank Sindh Coastal Resilience Project	2020
Authors: The Louis Berger Group Inc. In Association with Indus Associated Consultants	
1. Preparation of regional plan for left bank of Indus, Delta and Coastal Zone: Protective Plantation of Mangroves in the Coastal Areas of Left Bank	2012
2. Preparation of regional plan for left bank of Indus, Delta and Coastal Zone: Phase-3 Draft Report	2013
3. Preparation of regional plan for left bank of Indus, Delta and Coastal Zone: Main Report and Appendices	2013

*Note: These documents be downloaded **from here**. JBA source files can be downloaded **from here**.*

B. The Ensuing Project

5. The proposed Sindh Coastal Resilience Sector Project (SCRP) will help reduce flood risks and build resilience of the local infrastructure and the people. The project area is the Sindh delta and coastal region of the districts of Thatta, Sujawal, and Badin. The proposed project comprises three outputs: (1) climate resilient integrated water resources, drainage, and flood risk management solutions developed, (2) nature-based solutions for coastal protection restored, and (3) institutional and community capacity for strategic action planning strengthened. Output 3 will be implemented with support of an attached ADB technical assistance. During project processing, ADB will explore development of an additional parallel co-financing component for livelihood and economic transformation to be prepared and implemented separately by the International Fund for Agricultural Development (IFAD).

6. The project outcome is: risks of recurring damage to livelihoods, land, and freshwater from natural hazards and climate change in the coastal region reduced.[5] The project is aligned with the following impacts: (i) resilience of local communities against the adverse impacts of climate change enhanced, and (ii) impacts of flood events to coastal communities minimized. It is envisaged that the project will follow ADB's sector modality.[6]

7. The project is estimated to cost $180 million. The provisional financing plan is summarized below in Table 2.

[5] The draft preliminary design and monitoring framework is in Appendix 1.

[6] The project will support the government's implementation of the National Flood Protection Plan IV (2018). During project preparation, feasibility studies will be prepared for three representative subprojects. ADB and the Government of Sindh may adjust the project modality in accordance with needs.

Table 2: Summary provisional financing plan of ensuing project

Source	Amount[a] ($ million)	Share of Total (%)
ADB		
Ordinary capital resources (regular loan)	65.0	36.2
Ordinary capital resources (concessional loan)	60.0	33.3
Green Climate Fund[b]		
Loan	20.0	11.1
Grant	20.0	11.1
Government of Sindh	15.0	8.3
Total	**180.0**	**100.0**

ADB = Asian Development Bank

[a] Grant financing of $3 million for attached technical assistance is excluded. Non-ADB administered parallel cofinancing of $60 million from the International Fund for Agricultural Development is also excluded from the table. This will be explored during project processing.

[b] Subject to the approval of ADB's proposed Community Resilience Partnership Program by the Green Climate Fund and fulfillment of the effectivity conditions.

Source: Asian Development Bank estimates.

8. The expected implementation arrangements of the ensuing project are as follows. Planning and Development Department (P&D), Government of Sindh (GoS) will be the executing agency and oversee the project through a project steering committee. The implementing entities will be: (i) Output 1: Irrigation Department, GoS; (ii) Output 2: Forestry and Wildlife Department, GoS; (iii) Output 3 (technical assistance-supported): Sindh Coastal Development Authority, GoS and National Institute for Oceanography. It is expected that a project management and coordination unit (PMCU) will be established in the Sindh Coastal Development Authority. Detailed project implementation arrangements for the ensuing project will be confirmed during project preparation.

C. Implementation Arrangements of the TRTA

9. ADB will administer the TRTA and will recruit and supervise the consultants for project preparation. ADB and the consultants will work closely with designated counterparts including Sindh Irrigation Department, Sindh Forestry and Wildlife Department, Sindh Coastal Development Authority, National Institute for Oceanography, and district administration. Government of Sindh's P&D will oversee and coordinate the TRTA's multidisciplinary activities among counterparts and stakeholders.

D. Scope of Services

10. A consulting team led by an international specialist will develop and prepare the proposed investment project in line with ADB and government requirements, prepare draft documentation for ADB Board consideration and government's approvals, and support advanced procurement and safeguard actions. This will include:

(i) Project scoping, formulation, and packaging.
(ii) Conducting necessary background/supporting studies and surveys.
(iii) Preparing advanced feasibility studies (technical, financial, economic, environmental, and social viability), and due diligence (environmental and social safeguards, and institutional, governance, financial and procurement assessments).
(iv) Updating/preparing associated draft documentation (environmental and social safeguards assessments and frameworks; and institutional, financial and governance risk assessment; cost estimates; and initial bidding documents;

economic and financial assessment; climate change assessment; poverty, gender and social assessments; and updated draft Planning Commission PC-1 pro-forma).

11. The scope of the assignment will cover preparation of the ADB financed components of the proposed project (SCRP outputs 1, 2, and 3). The prospective IFAD financed livelihood component of the ensuing project would be prepared through IFAD's own arrangement and is not part of this consultancy service package. However, as applicable, the consultants will ensure good thematic and geographic alignment and coordination with the IFAD component to support the envisaged collective project outcomes and impacts. These will be reflected in the project documents including combined design and monitoring framework.

12. The project preparation should align with and build on the recommendations elaborated in earlier studies (Table 1), particularly the Approach Report. In line with the recommendation of the Approach Report, the geographical scope of the consulting assignment is FRM catchments 1 to 6 (see footnote 3). FRM catchment 7 has been identified as higher cost and risk, and lower readiness, and will not be the focus of the consulting services assignment unless otherwise agreed. Project design and preparation will use an integrated flood and erosion management (I-FERM) approach following hydrological boundaries, supporting climate resilience of assets and beneficiaries, environmental and financial sustainability, gender equity, inclusive access to livelihood opportunities, and scaling up use of nature-based solutions. The consultants will seek a high level of project quality and readiness, including procurement and safeguards readiness.[7] The consultants will recruit and manage sub-consultants for selected surveys and analysis.

13. The consultants will work in close coordination and collaboration with ADB, Government of Sindh, and other stakeholders. The consultants will ensure Japanese visibility in line with the requirements of JFPR.[8]

E. Outputs

14. The consulting assignment will comprise the following outputs.

15. **Output 1: Coastal resilience strategic framework with priority investments prepared.** The underlying evidence base, rationale, goals, and objectives for the project in delta/coastal region of Sindh will be prepared and documented. This will include screening and ranking of priority catchments and investments. The framework will update/confirm earlier prepared proposals and approaches (as listed in Table 1, among others) with due reference to updated government priorities, policies, and objectives; ongoing/planned studies and assessments by provincial and federal agencies; other ongoing development partner activities; and the impact and implications of the 2022 flood event.

16. The following documents and activities will be prepared to underpin the strategic framework.[9]

(i) Stakeholder engagement plan (SEP) for project preparation and implementation. The SEP will identify key stakeholders and guide the consultant's own consultations and actions during project preparation and implementation, support

[7] The project readiness is expected to include availability of: (i) bidding documents of first key procurement packages; (ii) implementation ready Initial Environment Examination (IEE) and Land Acquisition and Resettlement Plan (LARP); and (iii) Planning Commission Proforma (PC-1) for the government approval.

[8] Guidelines are available on request.

[9] The consultant may recommend and with prior agreement of ADB and the Government of Sindh conduct additional necessary studies to support the strategic framework and subproject prioritization.

the development of the capacity building program (see point (v) below). An outline SEP will be included in the inception report. The SEP will be updated upon completion of project feasibility study and due diligence (assignment output 2).

(ii) Poverty, gender, and social assessment (PGSA) with sex-disaggregated data to establish key benchmarks and identify needs and opportunities for beneficiaries (see Section F).

(iii) Climate change assessment with identification of adaptation and resilience options (see Section F).

(iv) Integrated Flood and Erosion Risk Management (I-FERM) study. Develop and apply an I-FERM modelling system for the delta region and carry out regional-scale assessment (across FRM catchments 1 to 6) to identify, analyse and interpret baseline and projected combined flood, erosion, and drainage risks (see Section F). The regional model will be used to identify flood and erosion hotspots, review the concept designs of the adaptation/mitigation interventions raised for the delta region, and prioritize the long list of subprojects. The modelling system will update and improve on the approach and results of the earlier Landell Mills/Jeremy Benn Associates Ltd. work (see Table 1) and should be prepared with the expectation of extending and improving the model to include detailed subproject specific analysis in assignment output 2.

(v) Wetlands, *dhoras* (natural drainage), and lake management study. Conduct regional-scale (across FRM catchments 1–6) baseline and scenario analysis of major threats and opportunities (see Section F). The assessment should be prepared with the expectation to extend it to detailed subproject specific analysis in assignment output 2.

(vi) Capacity needs assessment. This will assess the need for capacity building of the participating institutions and the beneficiaries for coastal and delta water and forestry resources management under the ensuing project and attached TA. This includes associated (sub-)sector development plans, institutions, and policies. Relevant and accessible external courses and training institutes will be identified. Training to the participating communities and the counterpart institutions and staff is envisaged through on-the-job training, knowledge sharing seminars, and workshops. The possibility of specific in-country training and short courses (2-3 months) and/or degree course in delta and coastal management will be discussed with the Government of Sindh for inclusion under the ensuing project. The plan would be finalized under assignment output 2.

(vii) Strategic procurement plan for envisaged procurement packages (see Section F). The plan would be finalized under assignment output 2 upon final project procurement packaging.

(viii) Update/establish water quality mapping of key drainage routes in prospective priority investment areas to manage prospective downstream impacts of subprojects, as applicable. Sampling points and timings are subject to recommendations and discussion between the consultant firm, Sindh Irrigation Department, and ADB, based on feasible interventions. Two samples are expected to be collected per location (wet and dry seasons). Water quality tests will be agreed and are expected to include, yet not be limited to; temperature, salinity, pH, biological oxygen demand (BOD), chemical oxygen demand, suspended solids, n-Hexane Extract, Coliform Bacteria Count, Total Nitrogen (T-N), Total Phosphorus (T-P), and heavy metals. Careful attention must be given to quality control. Results will be included in the project's final environmental safeguards deliverables.

17. Investment prioritization. In parallel, from the start of the assignment, the consultant will commence screening and ranking of FRM catchments 1 to 6 and in consultation with the stakeholders will bundle them into a program of 2-3 prospective investment projects for ADB financing. The first of these would be taken forward for further feasibility study and due diligence under output 2 of this consulting assignment.[10] A draft 'roadmap' of investment for SCRP under the sector modality should be prepared, comprising a short-listed set of subprojects and eligibility criteria.[11] Following a system-based integrated approach considering the hydrological drainage basin, the scope of the projects are likely to cover but not be limited to the following: (i) delta and river flood management structures; (ii) sediment management interventions; (iii) wetland restoration and management; (iv) floodplain management; (v) land use planning and zoning; (vi) monitoring and early warning systems; and (vii) community education and awareness. Subprojects with higher readiness may be taken forward for further study under output 2 prior to completion of output 1.[12]

18. The consultant will develop and apply screening, ranking, and selection criteria through meaningful consultation with stakeholders and delta communities (including women and marginalized groups). The prioritization will consider, yet not be limited to: subproject readiness/preparedness; technical and safeguards risks;[13] institutional complexity; demonstration opportunities; risk and levels of protection; cost benefit/effectiveness; and efficient implementation.[14] The prioritization is expected to be an iterative process and will start from the long list of priority subprojects for project outputs 1 and 2 prepared and screened in the Approach Report (see Table 1). As feasible and appropriate, it will incorporate results of modelling tools to inform/update knowledge about the feasibility of wider concepts and interventions in the region. Through their assessment process the consultant with the government counterparts may identify and propose better options or combinations of options that are internationally recognized and suitable to the environment.

19. **Output 2: Project prepared with enhanced readiness.** The consultant will prepare advanced feasibility study of at least three representative integrated subprojects with a high degree of readiness for the SCRP.[15] The consultant will advise/confirm and formulate corrective actions to overcome constraints of flooding, drainage, wetland connectivity, and erosion through integrated project interventions in prioritized areas. The recommendations and design will be informed by the Wetlands and I-FERM assessments (under assignment output 1) which will be enhanced with more detailed, high-resolution analysis and testing for the priority areas and proposed subprojects (see Section F). It will consider the findings of key underlying studies including climate change assessment, water quality, and poverty, gender, and social assessments. The consultant will undertake relevant hydrological analysis for a range of return periods for key interventions and hydraulic analysis for reliability, safety, and performance. The consultant will explore opportunities and integrate nature-based solutions in line with the project scope and recommend appropriate implementation systems (e.g., community engagement and third-party monitoring) and identify opportunities and potential mechanisms for forest carbon

[10] An estimated $125 million ADB financing and $40 million GCF financing will be available for the proposed SCRP (see Table 2). Subsequent subprojects may be prepared through budget of SCRP during implementation.
[11] This may be included in the project administration manual.
[12] This may allow Government of Sindh to commence early works through retroactive financing.
[13] Preferably avoiding subprojects with category A for environment or category A for involuntary resettlement.
[14] The subproject longlist and indicative level of preparedness of subprojects is indicated in the Approach Report (see Table 1).
[15] Any earlier pre-feasibility and feasibility studies and related documents will be made available upon mobilization. If resources are available under the contract, the consultant may prepare pre-feasibility/feasibility studies of additional subprojects beyond the initial representative subprojects.

credit generation by the Government of Sindh. The consultant will conduct (with subcontracting) the necessary geophysical/geotechnical surveys and ecosystem/biodiversity assessments.

20. The consultant will: (i) conduct economic and financial analysis to confirm viability and sustainability of representative subprojects and overall project; (ii) prepare financial management and procurement risk assessments and management action plans; (iii) prepare project environment and safeguards due diligence and assessment reports and/or mitigation plans for around 2–3 of the representative subprojects and associated environment and land acquisition and resettlement review frameworks in line with ADB and government requirements including biodiversity assessment and grievance redress framework; (iv) prepare sector assessment including development coordination; (v) prepare project cost estimate, financing plan, risk assessment and management plan, gender action plan, procurement plan, implementation schedule, implementation arrangements; (vi) design and monitoring framework including target and baseline indicators and data sources; (vii) draft documentation for ADB Board consideration and government project approval as required including PC-1 proforma; (viii) bidding document(s) with invitation for bids including draft drawings and bill of quantities for the first procurement package(s) totaling around 20–30% of ADB-financed goods and works budget;[16] and (ix) scoping documentation for attached technical assistance (to support project output 3).

F. Details and specifications of expected studies and due diligence

Integrated Flood and Erosion Risk Management (I-FERM) study

21. The consultant will develop and apply an I-FERM modelling system for the delta region to prepare quantitative combined flood, erosion, and drainage assessments at the regional (delta) scale and detailed (project focused) scale under outputs 1 and 2. The capacity for flood and erosion risk management is directly linked to sea levels, therefore combined and extreme sea levels should be investigated.

22. The consultant will apply appropriate/justifiable hydrological, hydrodynamic and hydraulic approaches and remote-sensing based spatial analysis support. This will provide the baseline understanding of the current and future risks to the delta system and inform choices for risk reduction. Flooding, erosion, and drainage in the Indus Delta is complex phenomena. The low-lying topography and rapid flash flood events result in slow drainage and high inundation which damages infrastructure assets, crops, and livelihoods.

23. The assessment is expected to include, but not be limited to:

24. ***Data gathering, field survey and review.***

i. Collect relevant information, literature, data, reports, and maps (including as listed in Table 1). Review and analyze the collated data and information to synthesis findings.

ii. Supervise and be responsible for necessary survey work (bathymetric and topographic, ecological survey as required) and check the information for quality and completeness. Supervise or carry out walk-over condition survey of the major drainage system and cross-drainage structures. A part of the survey work will be used for work during output 1.

iii. Detailed survey work is expected for the subproject-level analysis under output 2.

[16] With associated environment and social safeguards due diligence reports and/or mitigation plans prepared by the consultant.

iv. Develop the capacity profile of existing drainage network for drains, bunds, and major ponds or depressions.

25. ***Carry out flood and erosion analysis, develop scenarios, and return periods.***

i. Carry out rainfall analysis for various precipitation stations in the area and based on historical data and with future climate change impact, carry out hydrological analysis and quantify the flood flow for various rainfall frequencies. Develop appropriate return periods.

ii. Carry out flood risk analysis for various frequencies, downstream controls, and drainage capacities, estimate inundation time and depth and map the associated damages. The hydrological/hydraulic analysis of flood and its disposal will include both the fluvial and pluvial flooding. Assess the drainable surplus agricultural/ urban drainage. Develop appropriate present-day and future return periods and compare against recent flood 2022 event.

iii. Carry out analysis and assess the threat imposed by the sea level rise over time (for example, 10, 25, 50, 100, 200 years) including seawater intrusion and inland encroachment induced by storm surge using the data, survey and analytical tools deemed necessary. Develop appropriate return periods along the coast, for present and future scenarios of extreme sea level.

iv. Assess the impact of waves (both frequency and height) on the inundation and erosion. Develop appropriate return periods along the coast, for present and future scenarios.

v. Assess the possible changes in downstream control due to changes in mean sea level and/or delta use and behavior and analyze the impacts on the drainage pattern and disposal of floodwater.

vi. Carry out spatial analysis of the coastal area using remote sensing and field checking (when practical), map the temporal variations of the vegetation cover and identify coastal “hotspots” for flooding, inundation, and erosion perspective.

vii. Assess the past, on-going and upcoming actions including mangroves plantation and reforestation for relevancy and effectiveness to better manage flood and erosion in the delta.

viii. Assess blockages of drainage by roads, drains, canals and other man-made infrastructure, or inadequate design and/or maintenance of infrastructure.

ix. Assess the impact of construction of the proposed coastal highway on the flood pattern, drainage and inundation area including (a) the cross-drainage for adequacy and efficient disposal of storm water across and (b) the inundation due to high tide and extreme water levels (storm and surge events, plus climate change).

26. ***Identify management options and develop plan***

i. Develop a comprehensive plan for drainage and flood risk reduction including various scenarios and associated management options, and monitoring plan.

ii. Identify hotspots for delta and coastal erosion and protection, analyze the dominant processes responsible for the erosion, assess the suitability, integration, effectiveness and comparative advantages of the structural engineering and nature-based measures in the management solutions. Identify the potential for areas of mangrove restoration and reforestation to investigate erosion control throughout the inland and coastal delta.

iii. Assess co-design approach with community for custodial roles over wetland, mangrove, and reforestation initiatives, advise on the grazing management

scenarios and community-based controlled grazing options and avoidance of uprooting planted species.

iv. Respecting hydrological and administrative boundaries, advise the management solutions and technical, institutional and policy options for sustainable performance of natural ecosystems for a stable delta system.

Wetlands, *Dhoras,* and Lake Management Study

27. The wetland in the delta of Indus (fresh/saline water) are under serious threat at certain locations due mainly to reduced freshwater inflows and seawater or saltwater intrusion. By managing wetlands effectively, we can ensure that these valuable ecosystems continue to provide important ecological, social, and economic benefits for generations to come. The management of wetlands, *dhoras* and buffer zone will be new for Sindh Irrigation Department and may require advising an appropriate institutional mechanism.

28. The tasks are expected to include, but not be limited to:

29. ***Data gathering, field survey and review***

i. Collect relevant literature, reports and maps, review them and synthesize findings.

ii. Carry out/supervise the data collection by the sub-consultants, of lakes and *dhoras* (natural waterways, often blocked) and process the data to check completeness and quality.

iii. Collect data on flora and fauna and potential source of contamination of the wetland/lakes.

30. ***Carry out analysis***

i. Map *Dhoras* and wetlands and assess their status, as well as issues such as encroachment, blockages, and unplanned development.

ii. Using remote sensing techniques and ecological survey, identify wetlands, assess changes and their connectivity and characterize them for physical status (coverage, water quality, quantity/volume of water) and socio-economic and environmental services.

iii. Carry out hydrological assessment of inflows/water availability, outflow, and annual water balance for each major water body.

iv. Assess economic value of target ecosystems.

31. ***Identify management options***

i. Develop different options, screen them and select the suitable option for each major wetland.

ii. Develop a plan for *dhoras* for connectivity and improved services.

iii. Identify nature-based solutions that are suitable to improve the current situation on sustainable basis.

iv. Prepare a comprehensive plan for protection of freshwater lakes from salt water intrusion, identify engineering and non-engineering measures and institutional/administrative actions.

32. ***Carry out design and advise monitoring and management mechanisms***

i. Develop criteria for rehabilitation of wetlands and their improvement for connectivity. Apply the criteria and screen the wetlands for degree and nature of degradation and thereof improvement needs.

ii. Check the suitability and integrate the nature-based solutions in the wetlands management planning.
iii. Advise on requirement for policy, institutional and legal framework/interventions.
iv. Advise monitoring, modelling and management mechanisms including technical, policy and institutional aspects.
v. Advise on requirements for independent monitoring during project implementation.

Climate Change Assessment

33. The assessment will include (i) profile of communities and vulnerability and exposure in the project area; (ii) identification of climate change and variability of key climate indicators and climate hazards in selected area under a feasible envelope of future climates considering sources of uncertainty and model skill; (iii) consider risks to assets, project beneficiaries, and the river basin ecosystem; (iv) proposing set of costed adaptation measures to address impacts including interventions predicated largely on climate considerations; (v) assessing strengths and weaknesses of the local government and other stakeholders in climate challenges; and (vi) identify and tabulate reduced greenhouse gas emissions in line with established methodologies. The assessment should consider relevant national and provincial climate resilience strategies, plans, and guidelines. Prepare detailed climate risk assessment, summary climate assessment in line with ADB template, and checklist to confirm Paris Alignment.[17]

Environment Safeguards

34. The consultant team will prepare: (i) draft environmental safeguards categorization form, and scoping report for subproject environmental assessment; (ii) Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) and EARF reports to meet the requirements of ADB's *Safeguards Policy Statement* (2009), including a costed environmental management plan (EMP) and grievance redress mechanism that is in line with the Pakistan national regulations and will be a combined mechanism for handling both environmental and social concerns; (iii) assist the implementing agencies in conducting meaningful public consultation with the project affected people; (iv) assist the implementing agencies in consultation with relevant national authorities and getting necessary government environmental approval and permissions; and (v) assist the implementing agencies in ensuring that the bidding documents, as well as the project administration manual, adequately address the cost and tasks for environmental management plan (EMP) implementation. Selection of investment subprojects should seek to avoid significant and/or complex environmental issues.

Poverty, Gender, and Social Assessment

35. The assessment will follow ADB's Handbook on Poverty and Social Analysis: A Working Document (2012). It will include (i) demographic and gender profile of communities and vulnerability and exposure in the project area; (ii) access to social services and resilient infrastructure by marginalized communities, people below the poverty line, informal settlements; mobility patterns of women and men, means of transportation used by women and men, girls and boys; (iii) women's community involvement, including in local governance and disaster risk management, if any, or in any civil society organization; (iii) mapping of stakeholders, identifying where women are and their extent of involvement as stakeholders; (iv) organizational diagnostic of executing agency and implementing agency/agencies on gender balance and policies and programs that impact directly on women; and (v) a stocktaking of existing government policies,

[17] Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations.

plans, programs, and identify areas where women are impacted differently and thus need to be visibly involved. Results will be summarized in the Summary Poverty and Social Strategy document.

Land Acquisition and Resettlement Safeguards

36. The consultant team will (i) assess and compare government land acquisition and resettlement legislation, policies, and framework with those of ADB, (ii) assess all potential assets and people impacted with the project interventions; (iii) review any land acquisition legacy issues; (iv) prepare due diligence report or land acquisition and resettlement plan for the representative subproject and land acquisition and resettlement framework for the project as required based on the national legislation, policies, and framework and ADB Safeguard Policy Statement (2009) including entitlement matrix, cost estimate, and monitoring framework; and (v) assess the capacity of the executing agency to implement the resettlement plans and propose capacity building program. Selection of investment subprojects should seek to avoid land acquisition and significant and/or complex involuntary resettlement issues, including consideration of associated facilities and previous land acquisition using Pakistan's Land Acquisition Act (LAA) emergency clause.

Economic and Financial Analysis

37. The consultant team will conduct economic and financial analysis of the project in line with ADB Guidelines for the Economic Analysis of Projects (2017), ADB Preparing and Presenting Cost Estimates for Projects and Programs Financed by the Asian Development Bank (2014), and ADB Financial Management and Analysis of Projects (2005). The consultant may benefit from the report Strengthening Integrated Flood Risk Management: A Guide to Integrated Flood Risk Management Economics Consultant's Report (2022).[18] The analysis is expected to be conducted for each representative subproject. The analysis is expected to include cost-benefit analysis, analysis of alternatives, sustainability analysis, risk and sensitivity analysis, analysis of distribution of project costs and benefits, and identification of indicators and baselines for project design and monitoring framework. The analysis should consider major political economic issues related to access to water and water resources and protection infrastructure. The analysis is expected to include but not be limited to: (i) estimate project costs; (ii) identify and estimate project benefits; (iii) prepare financing plan and investment scenarios; (iv) carry out economic analysis of the project; (v) conduct sensitivity analysis using various scenarios of costs, benefits, and implementation schedules; and (vi) assess the financial sustainability of the project to confirm that adequate funds are available for maintenance of the various facilities created with project funds. The analysis is expected to consider benefits of avoided flood and erosion impact, agriculture productivity, livelihoods restoration, ecosystem services, and reduced greenhouse gas emissions.

Financial Management Assessment

38. The consultant team will conduct financial management assessment of the project in line with ADB Technical Guidance Notes on Financial Management Assessment (2015) and Project Financial Reporting and Auditing (2015), and ADB Financial Management and Analysis of Projects (2005). The financial analysis should cover the executing/implementation agencies as required considering implementation arrangements and fund flow, expected to be Sindh Irrigation Department and Sindh Forestry and Wildlife Department. A fiscal assessment of the government departments also needs to be conducted to assess their capacity to spend their budgets allocated.

[18] ADB. 2022. Strengthening Integrated Flood Risk Management: A Guide to Integrated Flood Risk Management Economics Consultant's Report (2022).

The team's activities are expected to include but not be limited to: (i) assessing whether previous financial management assessments have been conducted by ADB or other agencies and, if so, reviewing the results and ascertaining whether these can be used as input; (ii) assessing capacity for planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems; (iii) reviewing and recommending proposed disbursement and funds-flow arrangements; (iv) concluding on the financial management risk rating and identifying and confirming measures for addressing identified deficiencies through a time-bound financial management action plan; (v) supporting the preparation and agreement of cost estimates and a financing plan, which are based on verifiable data and are sufficient to support project implementation; (vi) preparing financial projections and conducting financial analyses of the executing and implementing agencies, and incremental recurrent costs, to determine financial sustainability; (vii) conducting financial evaluations (financial cost-benefit analyses) including sensitivity analyses of project components that have a cost-recovery objective; (viii) where significant risks are identified to project financial sustainability or viability, proposing relevant financial performance indicators to be incorporated in financial covenants; and (ix) assessing and reaching agreement on financial reporting, auditing and public disclosure arrangements for the project, and, as appropriate, identifying and agreeing arrangements for receiving financial statements from executing and/or implementing agencies.

Strategic Procurement Planning and Procurement Risk Assessment

39. The consultant team will prepare a project procurement risk assessment with (i) a strategic procurement plan appropriate for project requirements; and (ii) sector-related market risk assessment for planned procurement activities. The strategic procurement plan will assess the feasibility and approach for the envisaged co-design contract model for mangroves plantation and other procurement packages. For the general strategic procurement plan format, see Appendix 1 of ADB Guidance Note on Procurement: Strategic Procurement Planning. The market risk assessment should follow the ADB Guidance Note on Procurement: Procurement Risk Framework. The consultant team will prepare the draft procurement section of the project administration manual, including contract packaging in line with best international practices, ADB's procurement procedures, and the ADB Guidance Note on Procurement: Strategic Procurement Planning. ADB Guidance Notes on Procurement can be found at: https://www.adb.org/documents/guidance-notes-on-procurement.[19]

G. Terms of the Assignment and Counterpart Support

40. The expected duration of the assignment is 15 months, and the assignment of experts is intermittent in nature. The terms will be revised based on consultations between the parties involved in the assignment per changes and/or additional requirements identified during implementation.

41. The government will provide counterpart support in the form of counterpart staff, office space (primarily in Sindh Irrigation Department premises in Hyderabad, with satellite space in Karachi as required), and other in-kind contributions such as coordination with all the relevant agencies and the stakeholders including data and information access, and access to meeting facilities. The consultant team will report to the ADB project officer and will duly consult and coordinate with the designated officials from the Government of the Sindh.

[19] See also: https://www.adb.org/documents/adb-procurement-policy

H. Reports

42. **Reports.** The consulting firm will prepare and submit as a minimum the reports specified below.

(i) **Inception Report.** 1 electronic copy to ADB and 4 printed plus 4 electronic copies to government to be submitted within 4 weeks after the commencement of the Services. The report will include an update of the proposed approach and methodology for key tasks under each output, detailed workflow, staffing schedule, and schedule of deliverables.

(ii) **Midterm Report.** 1 electronic copy to ADB and 4 printed plus 4 electronic copies to government to be submitted within 22 weeks after the commencement of the Services. The midterm report is expected to present the results of the assignment output 1 and interim studies and deliverables as per agreed work schedule (see Table 3 below).

(iii) **Draft Final Report.** 1 electronic copy to ADB and 4 printed plus 4 electronic copies to government to be submitted within 52 weeks after the commencement of the Services. The draft final report is expected to present draft final deliverables, including all draft documentation for ADB Board consideration (see Table 3 below).

(iv) **Updated PC-1 Report.** Firm will support preparation of draft PC-1 report will be prepared following the format of Planning Commission Performa for the projects, which may include the project rationale and concepts, a brief of technical and economic feasibility, financing and implementation arrangements and design and drawings. Following government finalization of the report, the firm will arrange 50 copies to be printed and submitted to government within 54 weeks after the commencement of the Services. The schedule of the PC-1 submission may be advanced in accordance with the government's requirements.

(v) **Final Report.** 1 electronic copy to ADB and 4 printed plus 4 electronic copies to the government to be submitted within 63 weeks after the commencement of the Services. The consulting team will address and incorporate comments from ADB and the government on the Draft Final Report on as-needed basis to support the ADB Board approval process.

(vi) **Progress summaries** will be submitted every 4 weeks after the inception workshop. The report will record information required by ADB on project progress, including but not limited to (i) status of progress of each output in relation to the schedule, (ii) record of key meetings and consultations, (iii) assessment of challenges and ways to overcome them, and (iv) upcoming major tasks, meetings, etc. It is strongly encouraged that the progress summaries also include in-progress drafts of the midterm or final report (as appropriate) for advanced review and comment by the ADB project team.

Table 3: Expected schedule of submission of studies and deliverables

	Inception Report	Midterm Report	Draft Final Report
Supporting Studies and Documents			
1. Stakeholder Engagement Plan	Outline	Complete Draft	Draft Final
2. Integrated Flood and Erosion Risk Management study	Outline	Regional-level study	Consolidated regional and detailed study
3. Wetlands, *dhoras* (natural drainage), and lakes study	Outline	Regional-level study	Consolidated regional and detailed study
4. Capacity needs assessment	Outline	Complete Draft	Draft Final
5. Water quality survey	Outline	Complete Draft	Draft Final
6. Bidding documents and invitation for bids including draft bill of quantities and drawings[20]			Draft Final
Draft ADB Board Documents[21]			
1. Project Administration Manual			Draft Final
2. Summary Sector Assessment and Development Coordination			Draft Final
3. Detailed Sector Assessment and Strategic Framework		Complete Draft	Draft Final
4. Summary Economic and Financial Analysis			Draft Final
5. Detailed Economic and Financial Analysis			Draft Final
6. Gender Action Plan			Draft Final
7. Poverty Gender, and Social Assessment	Outline	Complete Draft	Draft Final
8. Summary Poverty Reduction and Social Strategy			Draft Final
9. Risk Assessment and Risk Management Plan			Draft Final
10. Attached Technical Assistance Report		Outline scope	Draft Final
11. Financial Management Assessment			Draft Final
12. Strategic Procurement Plan including Project Procurement Risk Assessment		Draft Strategic Procurement Plan	Draft Final
13. Climate Change Assessment	Outline	Draft Final (climate projections)	Draft Final (with adaptation options)
14. Technical Feasibility Study			Draft Final
15. Initial Environmental Examinations (IEEs) or Environmental Impact Assessments (EIAs)			Draft Final
16. Environmental Assessment and Review Framework (EARF)			Draft Final
17. Social Safeguards Due Diligence Reports or Land Acquisition and Resettlement Plans (LARPs)			Draft Final
18. Land Acquisition and Resettlement Framework (LARF)			Draft Final
19. Asset Management and Operation and Maintenance Plan			Draft Final
Government Documents			
20. Draft Planning Commission PC-1			Draft Final

43. **Language and formats.** All reports to ADB shall be produced in English. Urdu and Sindhi language translations of executive summaries of environment and social safeguards reports shall be prepared.[22] Reports shall be provided in both printed and electronic form. The consulting firm

[20] For first main works contract under the ADB loan.
[21] Sample documents are available on: https://www.adb.org/projects. Updated Word templates will be provided on request after mobilization.
[22] Translation and distribution cost shall be covered in consultant's proposal, under report preparation.

shall provide ADB with electronic versions of the reports and associated outputs/deliverables/analysis. All handouts, slide presentations, and related material for meetings and workshops must be in English. The consulting firm will be expected to budget all interpretation and translation services.

I. Meetings and Workshops

44. In assistance with the sub-consultants, the main consultant will organize and participate in meetings and workshops with ADB, the government counterparts, local community organizations and other stakeholders, and development partners to foster quality project outputs and stakeholder ownership. The meetings and workshops listed below are the minimum such sessions expected. If appropriate, the consultant firm is encouraged to conduct additional workshops and stakeholder sessions as deemed necessary.

(i) **An inception workshop** will be conducted to summarize and discuss the initial findings for the draft inception report and to agree on next steps.
(ii) **An midterm workshop** will be conducted to summarize and discuss the findings of the draft midterm report, finalize selection for feasibility study, and to agree on next steps for project processing.
(iii) **A final workshop** will be conducted to summarize and agree the findings of the draft final report.
(iv) **Extensive stakeholder consultations** should be undertaken with government counterparts, local community organizations and other stakeholders, and development partners as part of the delivery of each output.
(v) **Periodic progress review meetings** will be conducted with ADB and government counterparts, tentatively every 4 weeks.

J. Key and Non-Key Expertise Required

45. The consultant firm will preferably have demonstrated experience in designing, preparing, or implementing three (3) similar externally financed projects. A time-based contract will be awarded against the terms of reference.[23] ADB requires a minimum set of key experts, including a team leader, as tabulated in Table 4 below with estimated inputs. Additional non-key experts are also indicated. Firms may in their proposal add/combine/remove non-key specialists from the tabulated list in accordance with their proposed approach and methodology. A team leader will be selected from the international experts and is expected to be near full time in the project office.[24] Firms may propose an alternative international specialist as team leader, who will be evaluated against the team leader criteria.

46. The assignment is estimated to require 33 person-months international inputs and 104 person-months national inputs (key and non-key specialists).[25] The firm must determine and indicate in their proposal the number of person-months for each key and non-key expert. The firm should also provide a clear mapping of all their key and non-key experts to the required team outputs and tasks. Administrative and support roles (e.g., firm's own financial and contract

[23] Subject to negotiation.
[24] Firms may assume in their budgeting that visa extensions may be obtained in-country.
[25] These values are ADB's own estimates. The "minimum" person-months shown in the RFP data sheet are required from a systems perspective and do not represent the expected inputs of the Consultant. The Consultant shall insert the actual number of person months of staff time it deems are required to deliver the outputs required under the Contract. ADB will review the proposed time allocation of the Consultant as part of the technical evaluation of proposals.

management) should not be included as non-key experts. Such costs should instead be factored into the overall bid price.

47. Proposing entities should describe how they will ensure close coordination with several diversified stakeholders under their “communication and consultation strategy”.

48. The following provisional sums (non-competitive items) will be included in the consultant contract for subcontracting: (i) stakeholders engagement and consultation; (ii) acquisition of data, models, and other software licenses; (iii) topographic survey and preliminary geotechnical investigations including condition survey of drains, embankments, and associated structures; (iv) socio-economic and agricultural surveys; (v) environmental surveys including water quality and bio-diversity surveys; (vi) workshops and seminars; and (vii) PC-1 printing and distribution.

Table 4. Team Composition and Estimated Inputs

Position	Key/ Non-key	Person-Months
International		
Delta Hydrology and Flood Specialist (Team Leader)	**Key**	10
Coastal Engineer	**Key**	8
Environmental Specialist	**Key**	2
Natural Resource Economist	**Key**	3
Coastal Management Specialist	Non-key	6
Wetland and Ecosystems specialist	Non-key	4
Sub-total (International)		**33**
National		
Water Resources Management Specialist (Deputy Team Leader)	**Key**	12
Hydrodynamics Specialist	Non-Key	8
Climate Change Specialist	Non-Key	4
Wetland and Nature Based Solutions Specialist	Non-Key	4
Natural Resource Economist	Non-Key	4
Flood and Drainage Engineer	**Key**	6
Survey Engineer	Non-Key	4
Hydraulic Engineer	Non-Key	6
Structural Design Engineer	Non-Key	4
Geotechnical Engineer	Non-Key	3
Junior Engineer	Non-Key	8
GIS	Non-Key	4
AutoCAD Specialist	Non-Key	4
Quantity and Cost Estimation Engineer	Non-Key	4
Environment Specialist	Non-Key	4
Resettlement Specialist	**Key**	6
Social Development and Gender Specialist	**Key**	6
Biodiversity Specialist	Non-Key	2
Communication Specialist	Non-Key	4
Procurement Specialist	Non-Key	4
Financial Management Specialist	Non-Key	3
Sub-total (National)		**104**
Total (International and National)		**138**

Note: The Delta Hydrology and Flood Specialist is envisaged to be team leader. Firms in their proposal may recommend an alternative international key specialist as team leader, who will be evaluated against the Team Leader criteria.

K. Outline TOR for Key Experts

49. This section outlines the required qualifications and expected tasks of the experts. However, the list of tasks is indicative and actual tasks will depend on the approach and methodology and personnel schedule proposed by the firm, and the mapping of the key and non-key experts to tasks and outputs. In addition to the technical inputs specified below, each expert will support the team leader in (i) identifying relevant developments in government strategy, policy, and legislation; (ii) identifying best-practice techniques and lessons learned from previous and ongoing studies and projects of the relevant sectors as well as options to improve the project design; (iii) identifying project design and capacity building requirements specific to their field of expertise; and (iv) preparing relevant sections in the reports.

International Specialists

50. **Team Leader (International).** The Team Leader will lead the consultant team, manage relationships with the Government of Sindh, ADB, and other stakeholders and coordinate all TA inputs and outputs. This is expected to include but not be limited to (i) communication with the responsible ADB project officer and government counterpart focal points; (ii) planning and coordinating assignment scheduling and resource inputs; (iii) integrated project formulation; and (iv) oversight of due diligence, institutional assessment, safeguards, project packaging, document formulation, and reporting. The Team Leader must have at least a graduate degree (preferably post graduate degree) in water resources management, coastal engineering, project management, or related field. The Team Leader should ideally have 12 years' experience in preparing, designing, and implementing similar projects in water management or related fields with ADB or other similar development partners, with ideally 5 years' experience in a similar team leadership role. Country and regional experience in similar projects is preferred.

51. **Delta Hydrology and Flood Specialist (International).** The specialist will set directions and provide guidelines for hydrological assessment of the delta and the coastal area of Sindh from flood and drainage perspective. The specialist will, among others lead the I-FERM study. They will be responsible to analyze the situation, supervise the relevant analytical and modelling work on the screening, ranking and selection of subprojects, detailed feasibility study, capacity needs assessment, and project formulation and documentation including for the proposed projects' attached technical assistance. The specialist will provide quality assurance on relevant deliverables under the TA and will contribute to the relevant parts of the due-diligence documents. The Specialist must have at least a graduate degree (preferably post graduate degree) in coastal management, hydrology, or related field. The Team Leader should ideally have 12 years' experience in preparing, designing, and implementing similar projects in delta management or related fields. Experience with advanced approaches to delta flood risk management is preferred. Country and regional experience in similar projects is preferred.

52. **Coastal Engineer (International)**. The coastal engineer will lead the prioritization and development of project interventions. The specialist will lead a review of the past efforts via a screening, ranking and selection process to provide suitable sustainable and holistic concept designs under present day and future conditions, followed by a detailed feasibility study utilizing the I-FERM modelling. They will lead or support the Wetlands study. The specialist will provide quality assurance on relevant deliverables under the TA and will contribute to the relevant parts of the due-diligence documents. The Coastal Engineer must have at least a graduate degree (preferably post graduate degree) in coastal management, civil engineering, or related field. The Coastal Engineer should ideally have 10 years' experience in preparing, designing, and implementing similar projects in delta management or related fields. Experience with advanced

approaches to delta flood risk management is preferred. Country and regional experience in similar projects is preferred.

53. **Environmental Specialist (International).** The specialist will lead the work on environmental assessment in line with ADB and government's requirements. The specialist's tasks are expected to include but not be limited to: (i) develop TOR for the environment and ecological survey sub-consultant, (ii) assist procurement specialist to select the sub-consultant, (iii) supervise the survey and review the outputs of the sub-consultant and be responsible for it, (iv) undertake screening and categorization as per ADB's Safeguards Policy Statement (2009); (v) prepare a scoping document for carrying out the environmental assessment studies (initial environmental examination [IEE] or Environmental Impact Assessment [EIA]); (iii) undertake impact assessment covering design, construction, and operation stages of the project and propose mitigation measures to minimize and/or mitigate the impacts; (vi) provide input in the Stakeholder Engagement Plan (SEP) and prepare and undertake stakeholder consultations; (vii) conduct baseline surveys and detailed assessment on soil/slope stabilization and erosion, hydrology, waste, health and safety including (but not limited to) occupational health, biodiversity, air quality, noise, surface water, groundwater, traffic, archaeology and cultural heritage, safety, community severance, etc.; (viii) prepare required environmental assessment studies, i.e. IEE or EIA reports, including the environmental management plans (EMP), and environmental assessment and review framework (EARF) for the project; (ix) oversee preparation of biodiversity assessment incorporating results into project document. The specialist must have at least a graduate degree (preferably post graduate degree) in environmental sciences, biology, development studies, engineering, or related field, with ideally 10 years' experience in environmental due diligence or similar contexts. Country and regional experience in similar delta projects is preferred.

54. **Natural Resource Economist (International)**. The economist will lead background economic valuation studies and project economic analysis. They will support screening, ranking and selection of subprojects and detailed feasibility study that results in sound economic basis of protection of wetlands, delta, and coastal area. The specialist must have at least a graduate degree (preferably post graduate degree) in economics or related field, with ideally 10 years' experience in economic due diligence or similar contexts. Experience with advanced economic valuation of ecosystems and natural capital accounting approaches is a benefit. Country and regional experience in similar projects is preferred.

National Specialists

55. **Water Resources Management Specialist/Deputy Team Leader (National).** The specialist, with the international specialist, will conduct data collection and analysis, subproject identification, feasibility study and design, incorporating relevant adaptation options. As deputy team leader, the specialist will assist and act as team leader in the absence of the Team Leader. The specialist must have a graduate degree (preferably post graduate degree) in water resources or related fields and a minimum of 12 years of experience working on similar projects. Experience in similar projects, particularly with ADB or other similar development partners, is preferred.

56. **Flood and Drainage Engineer (National).** The specialist will be responsible for all the assessments, scenario development and design of management options for all the flood risks and drainage related issues associated either with engineering or non-engineering measures. The specialist will be responsible for all analytical work and associated technical management in coordination with other experts and the stakeholders. Under the guidance of international specialists and with support from the relevant national experts, the specialist will play catalytic

role and selection of subprojects and preparation of advanced feasibility study and preparation of due-diligence documents. The flood and drainage engineer must have a graduate degree (preferably post graduate degree) in water resource, flood and drainage engineering, or related fields and a minimum of 10 years of experience working on similar projects. Experience in similar projects, particularly with ADB or other similar development partners, is preferred.

57. **Resettlement Specialist (National).** The specialist will lead the work on land acquisition and resettlement safeguards in line with ADB and government's requirements. The specialist's tasks are expected to include but not be limited to: (i) prepare and undertake stakeholder consultations and surveys and initial subproject categorizations; and (ii) prepare land acquisition and resettlement due diligence report(s) (DDRs) and/or land acquisition and resettlement plans (LARPs) and land acquisition review framework (LARF). The specialist must ensure meaningful consultations are undertaken with affected persons; assess adequacy of government compensation rates for affected land and non-land assets and confirm whether an independent valuation study will be required; and consult with relevant government agencies on proposed mitigation measures. The specialist will (i) advise on the safeguards readiness of sites that may require land acquisition (trigger the Land Acquisition Act) including the necessary milestones that need to be achieved for ADB processing; (ii) assess any legacy resettlement/social issues that may need to be considered and for which a corrective action plan may be needed; (iii) advise on the early establishment and structure of the grievance redress mechanism [GRM] including notification of the grievance redress committees; and (iv) provide input to the stakeholder engagement plan prepared by the social development/gender specialist, and other relevant board documents. The specialist must have at least a graduate degree (preferably post graduate degree) in social sciences, development studies, or related field, with ideally 7 years' experience in resettlement planning and social safeguards due diligence, including application of social safeguards of ADB, World Bank or agency with similar social safeguards policies. Experience in similar projects, particularly with ADB or other similar development partners, is preferred.

58. **Social Development and Gender Specialist (National).** The specialist will lead and oversee the preparation of the stakeholder engagement plan; poverty, social, and gender assessment; and formulation of the gender action plan (GAP), summary poverty reduction and social strategy (SPRSS), and other relevant gender due diligence reports. The tasks are expected to include but not be limited to analyzing the data collected and ensure that the results of social and gender analyses are fully reflected in the social and gender assessment report, which in turn are reflected in the initial GAP and SPRSS that s/he will prepare. The specialist must have at least a graduate degree (preferably post graduate degree) in social sciences, gender studies, development studies, or related field, with ideally 7 years' experience in social science and gender development sector or similar assignments, and 5 years' work experience on gender mainstreaming in multilateral development organizations. Experience in similar projects, particularly with ADB or other similar development partners, is preferred.

APPENDIX 1: DRAFT PRELIMINARY DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with Resilience of local communities against the adverse impacts of climate change enhanced.[a] Impacts of flood events to coastal communities minimized[b]			
Results Chain	**Performance Indicators**	**Data Sources and Reporting Mechanisms**	**Risks and Critical Assumptions**
Outcome Risks of recurring damage to livelihoods, land, and freshwater from natural hazards and climate change in the coastal region reduced	By 2033: a. X million people (of which 50% are women) benefitting from reduced risks from climate-related hazards[c] (2022 baseline: xx) (OP 2.5; OP 3.2) b. X km of roads and water conveyance structures and X ha of crop land benefiting from reduced risks from climate-related hazards (2022 baseline: xx) (OP 3.2.1; OP 5.3) c. XX CO_2 emissions reduced from improved forests and wetlands (2022 baseline: xx) (OP 3.1)	a–c. Pakistan Bureau of Statistics: Pakistan's annual social and living standard measurements; annual district data; annual land use and agricultural data.	R: Extreme weather conditions damage settlements and critical infrastructure. A: The government of Sindh continues to prioritize development of coastal region.
Outputs 1. Climate resilient integrated water resources, drainage, and flood risk management solutions developed	By 2032: 1a. XX number of well-connected and climate resilient drainage systems improved (2022 baseline: XX) (OP 3.2.5) 1b. X of climate resilient outfall structures and cross drainage structures installed or upgraded (2022 baseline: XX) (OP 3.2.5) 1c. XX km of natural waterways and XX ha of natural depressions restored (2022 baseline: none) (OP 3.2.5)	1a–c. QPRs by PMU; annual reports by SID.	R: Extreme weather conditions interrupt the construction and engineering of nature works significantly. A: Government of Sindh supports integrated cross-sectoral infrastructure development.
2. Nature-based solutions for coastal protection restored	2a. X ha of coastal area forest, mangroves, and wetlands restored,	2a–b. QPRs by PMU; annual reports by SFD	

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
	enhanced, or protected (2022 baseline: none) (OP 3.2.1; OP 5.3) 2b. XX number of community members participated/engaged (XX% women) in mangrove and other coastal protection activities (2022 baseline: none) (OP 2.5.1, OP 3.2.2)		
3. Institutional and community capacity for strategic action planning strengthened	3a. Gender-sensitive coastal area strategic action plan with coastal zone management plans including climate change considerations prepared[d] (2022 baseline: xx) (OP 2.3.2; OP 3.2.4) 3b. XX number of community members (of which XX% are women) report improved knowledge in climate risks and water resources management (2022 baseline: none) (OP 2.5; OP 3.2) 3c. XX number of government staff (of which XX% are women) report improved knowledge in delta and coastal area management including climate risk management (2022 baseline: xx) (OP 2.5; OP 3.2) 3d. XX tidal, water resources, and hydrometeorological gauging and measurement equipment installed in the coastal region (2022 baseline: XX) (OP 3.2.5)	3a–d. Quarterly progress reports by PMU	

Key Activities with Milestones

1. Climate resilient integrated water resources, drainage, and flood risk management solutions

Key Activities with Milestones

developed

1.1 Identify, screen, and prioritize water storage and waterway requirements by XX 202X.
1.2 Measure, assess and design the drains or networks for improved efficiency and connectivity by XX 202X.
1.3 Establish monitoring and reporting regime for water and sediment conveyance and quality by XX 202X.
1.4 Prepare mechanism for asset management and maintenance of the built or natural waterways by XX 202X.

2. Nature-based solutions for coastal protection restored

2.1 Assess and prioritize proposed nature-based solutions by XX 202X.
2.2 Co-design subprojects with the participating communities by XX 202X.
2.3 Establish mechanism for asset management, including forest carbon monitoring and stewardship by XX 202X.
2.4 Implement capacity building for managing and planning forest carbon resources by XX 202X.

3. Institutional and community capacity for strategic action planning strengthened

3.1 Update and complete needs assessment for capacity building by XX 202X.
3.2 Establish consortium of key federal, provincial, academic, nongovernment organizations structured into a collaborative task force by XX 202X.
3.3 Establish Sindh coastal modelling and management system by XX 202X.
3.4 Conduct provincial and international knowledge sharing events by XX 202X.

Project Management Activities

Establish a project management unit office and procure consulting and surveying services by XX 202X.
Prepare contract packages and award the contract/s by XX 202X.
Supervise construction activities and carry out performance evaluation by XX 202X.
Prepare project completion report by XX 202X.

Inputs

ADB: $65.0 million (regular OCR loan)
$60 million (concessional OCR loan)
Green Climate Fund: $20.0 million (grant) and $20.0 million (loan)[e]
Attached TA: $3.0 million (grant)[f]
IFAD: $60.0 million (loan)[g]
Government: $15.0 million (taxes and duties)

A = assumption, ADB = Asian Development Bank, CO_2 = carbon dioxide, ha = hectare, IFAD = International Fund for Agricultural Development, km = kilometer, OCR = ordinary capital resources, OP = operational priority, PMU = project management unit, QPR = quarterly periodic report, R = risk, SFD = Sindh Forestry and Wildlife Department, SID = Sindh Irrigation Department, TA = technical assistance.

[a] Government of Pakistan. 2021. *Pakistan's Updated Nationally Determined Contribution.* Islamabad.
[b] Government of Pakistan. 2018. *National Flood Protection Plan IV*. Islamabad.
[c] Reduced risks estimated through ex-ante flood and erosion risk modelling.
[d] The strategic action plan will include targets and actions to (i) strengthen women's representation in senior and technical positions coastal area management decision-making positions and structures and (ii) enhance capacity on gender assessment of coastal area risks and vulnerabilities.
[e] Subject to the approval of ADB's proposed Community Resilience Partnership Program by the Green Climate Fund and fulfillment of the effectivity conditions.
[f] Attached TA to support implementation of Output 3. Funding sources of the attached TA will be explored and confirmed during project processing.
[g] Parallel cofinancing from IFAD to be explored during project processing.

Contribution to Strategy 2030 Operational Priorities:

In the RRP, the expected values and methodological details for all OP indicators to which this operation will contribute results will be detailed in the Contribution to Strategy 2030 Operational Priorities linked document.
Source: Asian Development Bank.