



GLOBAL
CENTER ON
ADAPTATION

Deltares

Water Adaptation Community Webinar

Mobilizing Finance for Climate Adaptation in Deltas

26th May 2023, 13:00 CEST

Webinar Knowledge Kit



Knowledge Kit Content

- Background
- **Presentation:** Climate adaptation in the Netherlands, financing the Delta Programme
- **Presentation:** Climate Bridge Fund (CBF): an innovative finance mechanism to improve adaptive capacity and resilience in Bangladesh
- **Presentation:** IHE Delft - ProCAD and BuildCAD Project in Colombia
- **Presentation:** Prioritizing and Mobilizing Finance in Coastal Cities: Experience from Accra, Ghana
- Related Links
- Stay Connected

Background

Chair:

Ms. Meike van Ginneken, Governing Board Member IHE, Incoming Water Envoy for the Netherlands

Speakers:

- Dr. Amgad Elmahdi, Water Sector Senior Specialist, Green Climate Fund
- Mr. Peter Glas, Delta Commissioner of the Netherlands
- Dr. Md Golam Rabbani, Head of Climate Bridge Fund Secretariat, Bangladesh Rural Advancement Committee (BRAC)
- Mr. Leonardo Alfonso, Associate Professor of Hydro informatics. IHE Delft
- Mr. Christopher Chung, Senior Urban Specialist Global Center on Adaptation

Watch the recording [here](#).

- Marine transportation and ocean tourism are trillion-dollar industries. Without climate adaptation measures, damage to infrastructure, losses in crop production, and reduced fishing yields could cause average GDP losses of up to 19.5 percent in the world's deltas similarly, it is estimated that flooding due to climate change could affect 20% of global GDP. As the impacts of climate change continue to intensify, flooding risk will increase, putting infrastructure valued between US\$7.9 and US\$12.7 trillion at risk, as well as the lives of hundreds of millions of people. With 40% of the global population living within 100 km of the coast and 11% living in low-lying coastal areas, the impacts of sea level rise could be felt as soon as 2050. Accelerating adaptation efforts is essential to protect people, landscapes, economies, and even the very existence of some islands and deltaic coasts.
- "Futureproofing Water and Climate Adaptation" is a webinar series focused on adaptation strategy, practices, and financing for deltas, urban deltas, small islands and coastal areas. The series is designed to support the ambition of the International Panel on Deltas and Coastal Areas - to build capacity for effective adaptation planning, governance and finance – through online knowledge sharing and creation. This series of webinars consists of sharing good practices, panel discussions and interactive community dialogues. The "Mobilizing Finance for Climate Adaptation in Deltas" webinar illustrates how deltaic countries leading in climate adaptation have used high-ambition decision-making and large-scale investment to prepare for future challenges.

Related Links

- [Delta Programme Webpage](#)
- [Climate Bridge Fund Webpage](#)
- [GCA's City Adaptation Accelerator](#)
- [GCA blog: Three Ways to Bridge the Adaptation Funding Gap in Africa](#)
- [Webinar Recording](#)



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Climate adaptation in the Netherlands, financing the Delta Programme

GCA webinar Mobilizing Finance
For Climate Adaptation in Deltas
May 26, 2023

Peter C.G. Glas MSc LLM
Delta Programme Commissioner

NATIONAL
DELTA PROGRAMME





The Netherlands, a delta country



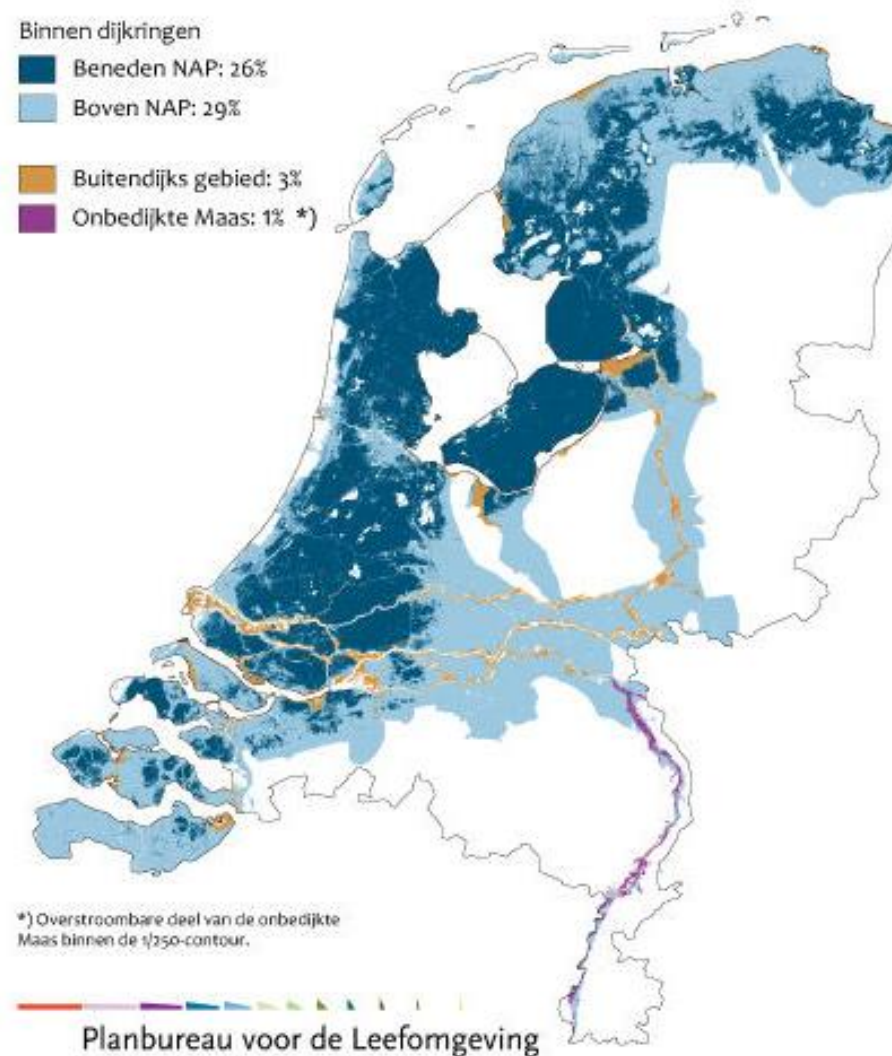
Binnen dijkringen

■ Beneden NAP: 26%

■ Boven NAP: 29%

■ Buitendijks gebied: 3%

■ Onbedijkte Maas: 1% *)





Delta Programme (2010 – present)

2008 Delta Committee (long term developments)

2010 1st Delta Commissioner appointed

2011-pres. Annual Delta Programme:

- Flood protection
- Fresh water availability
- Spatial Adaptation

2012 Delta Act & Delta Fund

2015 Delta decisions & strategies adopted

2017 New flood safety standards codified by law

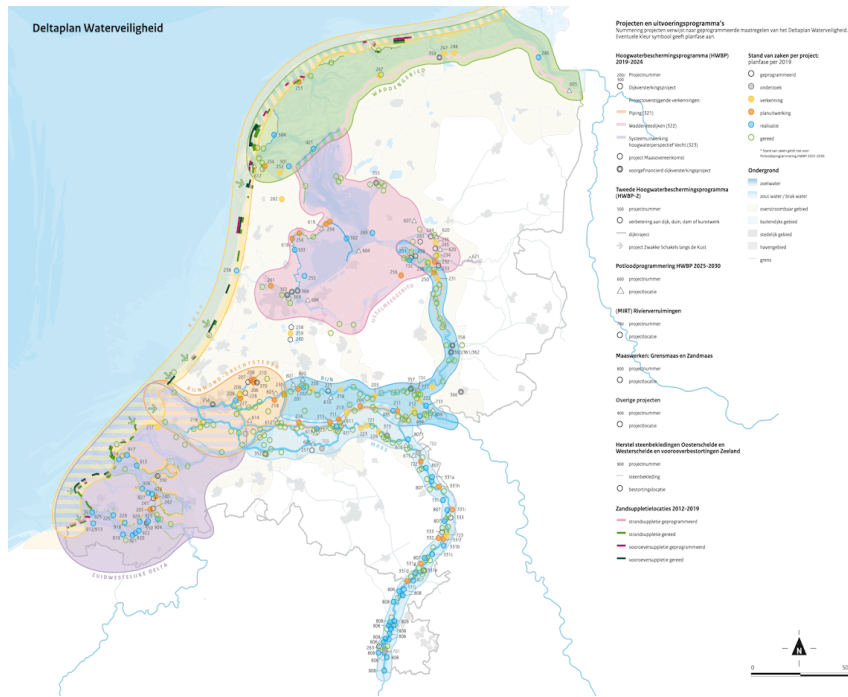
2020 1st 6yr Recalibration of decisions and strategies

2026 2nd 6yr Recalibration





Delta programme regions – co-financing of three annual Delta Plans



Flood protection

- 1500 km dykes by 2050 (43%)
- € 400 mln./yr
- 50/50 central government – water boards



Freshwater availability

- 2015-2021 € 400 mln.
- 2022-2028 € 800 mln.
- € 1 / € 3 central government /decentral gov. agencies



Spatial adaptation

- 2021-2027 € 600 mln.
- € 1 / € 2 central government /decentral gov. agencies



Government Water Institutions: Main Structure

Water framework directive
Municipal water directive
Drinking water directive
Ground water directive
Regional flood risk directive



European Union



National water policy, legal standards, supervision,
operational tasks national water infrastructure

National Government

Ministry for Infrastructure and Water Management
Delta Commissioner
Rijkswaterstaat (Nat. Water Agency)



Regional water policy, licensing the major
groundwater abstractions and supervision on
Regional Water Authorities and Municipalities

Flood protection,
water quantity and
quality management,
waste water
treatment

Drinking water
production and
supply

Sewage system, storm
water collection and
urban groundwater
level





All water services in The Netherlands are publicly owned and operated

- All water tasks together cost appr. €8 bln per year (appr 1% of GDP of the Netherlands)
- Appr 20% is financed by central government (mainly through the Delta Fund),
- Appr 80% is financed by local and regional branches of government (and drinking water companies) through taxes and tariffs paid by households, businesses, infrastructure, land owners and farmers

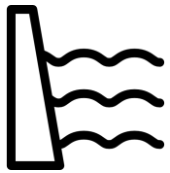


A changing financial climate adaptation landscape

- Dutch Central Bank (DNB) Sustainable Finance: Climate Adaptation Workforce (scenarios, adaptation and financing), report expected by end of 2023
- Deloitte Impact Foundation: Netherlands Climate Adaptive study, to be presented to the Delta commissioner November 2023
- *Rethink The Delta*: initiative between private and public sector on future long term adaptive strategies for impact mitigation and prevention financing
- Annual Dutch Delta conference (November 9 in Groningen)
 - 2022: keynote by financial sector: “the cost of doing nothing”
 - 2023: special session by the Financial Sector



Three lines of defense, public-private flood risk financing and insurance



Risk prevention

- Green Dutch State Loans (€16 bn, financing ao Deltafund)
- NWB Water Bonds (€5.7 bn, financing regional Water Authorities)
- NWB Water Innovation Fund
- Dutch Financial Sector (Pension Funds and Insurance Companies) invests in Green Dutch State Loans and Water Bonds



Risk mitigation

- Decentral governmental climate resilience subsidies
- Building requirements decree
- Mortgage and Insurance conditions related to flood risks and climate adaptation



Risk recovery

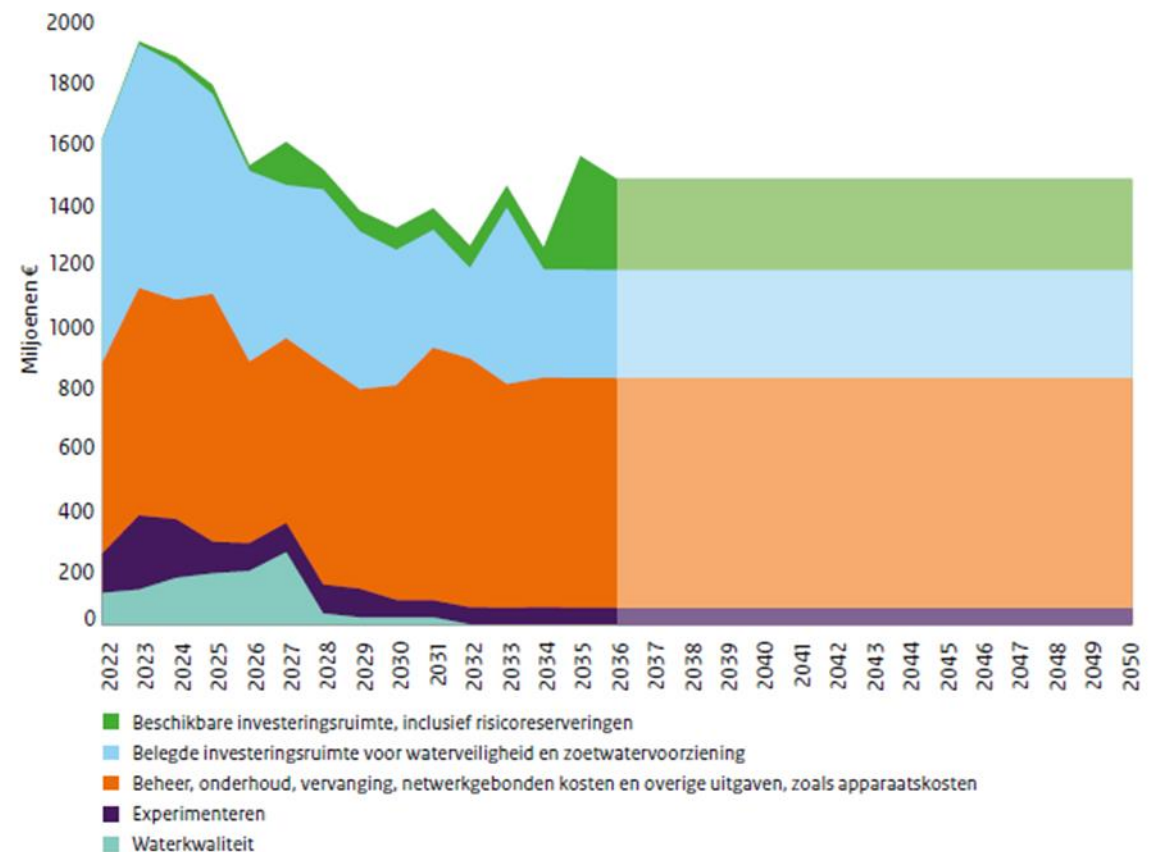
- Disaster Compensation Act (WTS): (partial) compensation for uninsurable, unavoidable, and non-recoverable damage from disaster. Depends on a political decision.
- Voluntary Flood Insurance: available for businesses and individuals, covering local flooding and regional flooding (not primary defense floods)



Structural and adaptive character of the Delta Fund

- Structural financing up to €1,5 bln/year
- Appr. 52% available for investments in the Delta Programme (co-financing)
- Appr 48% for costs of maintenance RWS, not part of the Delta Programme
- Delta Fund: € 21 bln reserved 2023-2036
€ 22 bln projected 2036- 2050
- Stable and adaptive financial outlook: long term availability of financing, and annual adjustments

Tentatieve extrapolatie Deltafonds





Lessons Learned from the adaptive character of the Delta Programme and Delta Fund



Decision making in an uncertain future

→ Calls for adaptive strategies:

- Clear in objectives,
- Adaptable to actual conditions
- Avoid lock-ins
- Linking short term agenda's with long term water challenges

Implementation in an uncertain future

→ Benefits from:

- Flexible measures (“speed up/slow down”)
- Building with Nature or robust design
- Spatial planning (water and soil conditions prioritize)
- Stable budgetary outlook (2023 → 2036 → 2050)



**Thank you for
your attention**



Peter C.G. Glas MSc LLM
Delta commissioner



@delta_comm

@deltaprogramma

info@deltacommissaris.nl

<https://english.deltaprogramma.nl/delta-programme>



Mobilizing Climate Finance for Climate Adaptation in Deltas

Climate Bridge Fund (CBF): an innovative finance mechanism to improve adaptive capacity and resilience in Bangladesh

Dr. Golam Rabbani
Head, Climate Bridge Fund Secretariat

26 May 2023



Implemented by:
KFW

Climate Bridge Fund

- Established on November, 2019 by BRAC, with support from German government through KfW in Bangladesh
- Innovative, direct climate finance mechanism, supporting registered NGOs of Bangladesh for urban adaptation measures in the context of climate induced migration.
- Currently funding projects cover 26 districts of Bangladesh
- Stakeholders: Govt. agencies, I/NGOs, LGAs, local communities, CBF Secretariat, trustee board, advisory body.
- Financial mechanism: Grant support received from German govt., co-financing is also welcomed.

What Makes the funding innovative and unique?



Local ownership

The project concepts are prepared in close cooperation and consultation with local authorities, e.g. city corporations and Pourashavas (municipalities). The project concepts must be in line with key policies and plans. Ips must be a local organization



Gender and socially inclusive

Gender inclusion is a major criteria for selecting and supporting projects. The fund prioritizes projects that are inclusive, addressing gender and the most vulnerable groups and communities.



Bottom-up approach

The project ideas are developed in discussion with local communities who are vulnerable.



Bridging short term to sustainable model

The CBF has been set up to “bridge” the financial gap from short-term project funding to the sustainable provision of services and infrastructure for climate-induced migrants.



Innovative practice

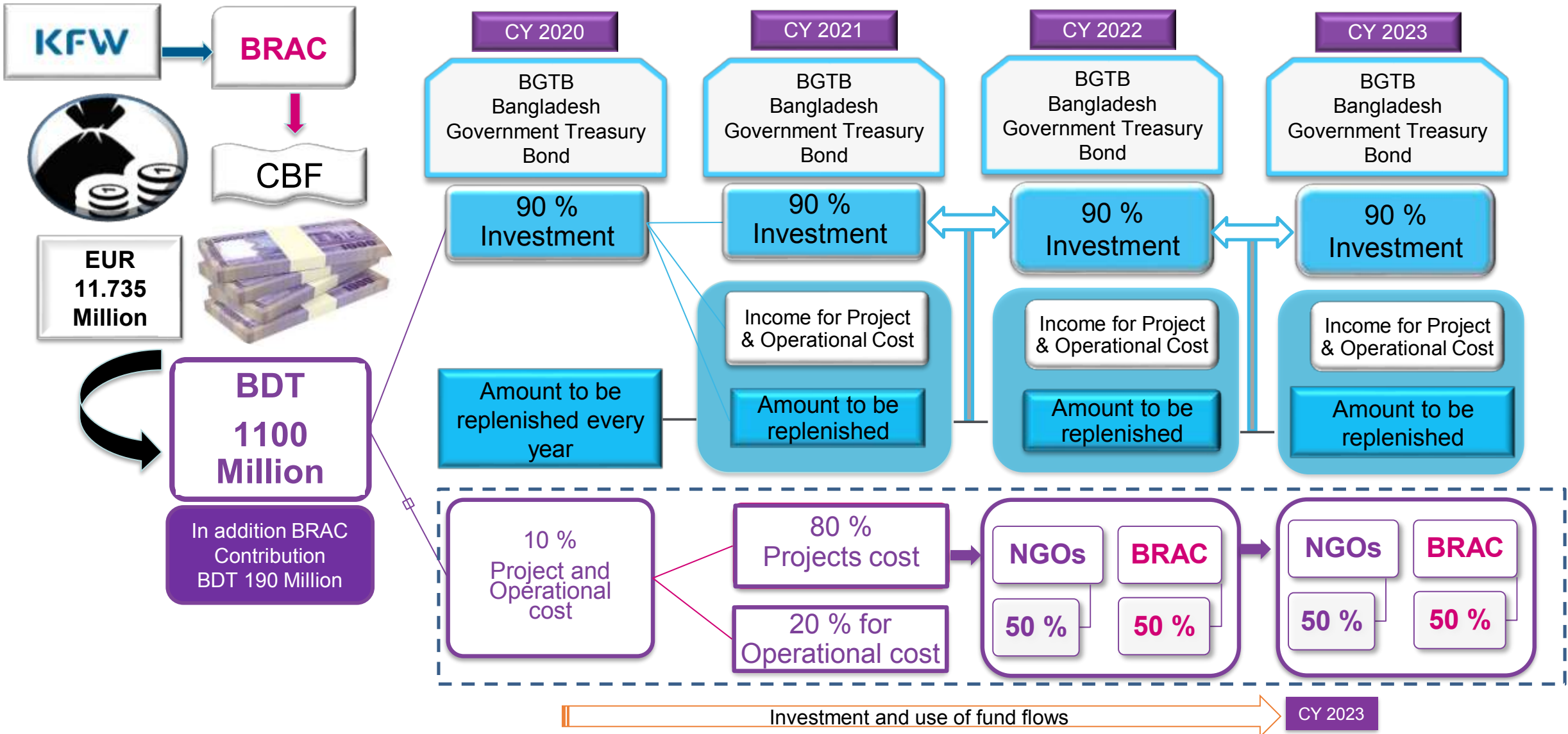
The fund promotes innovative ideas for effective adaptation in vulnerable locations.



Generating knowledge and evidence

CBF supports research to identify knowledge gaps on climate change induced migration and develop strong evidence.

How did the fund get started?



How does CBF works now?

Major Stakeholders

BRAC

- Legal partner for Financing Agreement
- Settlor of the Fund.
- Employer of the Trustees

KFW

- Development partner
- Provide no objection
- Progress review and fiduciary supervision

Principal Organs

Board of Trustees

- All strategic decisions
- Oversee fund management investment and disbursement

ACCF

- Advises the trustees on strategic decisions
- Selection of funded projects / awards grants

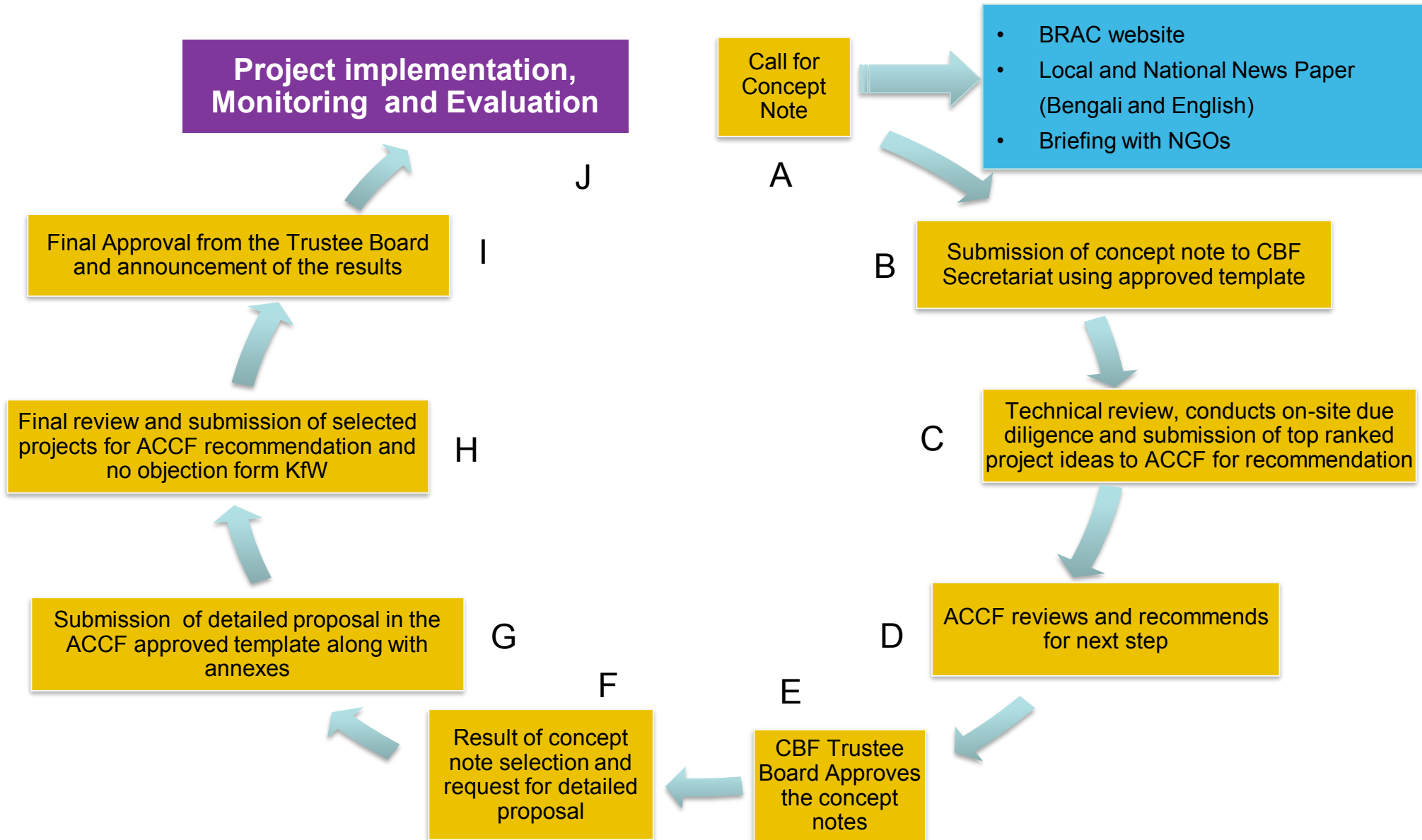
CBF Secretariat

- Overall coordination, administration, effective and efficient management of fund and implementation

Implementing Partners

- Implement the funded project
- Monitor and report to the Fund Secretariat on progress of the funded projects
- Ensure that the grant is prudently managed and solely used for project purposes

Project Selection Processes: How priorities are set? Who approves the budget?



Lessons learnt

Technical learning

-Integration of future climate projections to ensure effectiveness of adaptation

Process Learning

-Analysing needs to identify co-benefits in project designing

Field based learning

- Engagement of target communities and local authorities are crucial to identify the key problems and adaptation solutions
- Ownership of the land- target communities are primarily vulnerable climate migrants living in informal settlements (lands are owned by either Government and others)
- Vulnerability and needs are huge but provided support is comparatively small

Policy Learning

-Changes of government policy may affect the financial scenario and associated investment income

Thank You!



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**Institute for
Water Education**



unesco

Centre
Under the auspices
of UNESCO

ProCAD and BuildCAD

Small projects contributing to coastal
adaptation in Colombian deltas

Leonardo Alfonso, Associate Professor IHE Delft

Webinar: Mobilizing Finance for Climate Adaptation in Deltas

26 May 2023



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Content

- Introduction and Context
- Funding
- Overview of projects
 - ProCAD
 - BuildCAD
- Findings / lessons learned

Introduction and context

Strategic alliance between Colombia and the Netherlands

- Cooperation in Climate Adaptation
 - Sustainable Development Goals
 - Paris Climate Agreement



The world's first international coalition of governments to address inclusive and sustainable development in deltas, combining economic development with resilience building and CCA measures



International network of knowledge-driven institutions with a mission to enhance the resilience of the world's deltas against the pressures of population growth, industrialization, and a changing climate

Colombia



Ambiente

**Ministry of Environment and Sustainable Development
(MADS)**



Vice ministry
Territorial Environmental Planning


Direction
Climate Change and Risk Management




MADS interests in Delta Alliance / Coalition

- To help implementing Ministry's Action Plan for sustainable development of deltas
- To learn about how other countries are approaching similar challenges
 - to establish working relations with international organisations
 - to revise, select and share good practices for adaptation projects
 - ...

Oportunidades de ejecución del Plan de Acción  El ambiente es de todos  Minambiente

 **Objetivo:** Desarrollar una base de conocimiento y utilizar una fuente de conocimiento e información ya existente para el desarrollo sostenible de Deltas y zonas costeras

No	Objetivos	Eventos	Periodo de tiempo	Agencia líder / Organización
		1. Establecer relaciones de trabajo con: institutos de conocimiento, socios nacionales e internacionales. Organizaciones como Delta Alliance, BUET, Instituto de Modelado del Agua (IWM), Centro para Información ambiental y geográfica Servicios (CEGIS), Instituto Global de Crecimiento Verde, Global Water Partnership (GWP), India Water Fundación (IWF), Unión Internacional para Conservación de la Naturaleza (UICN) , Japan Riverfront Centro de Investigación (RFC), Estocolmo Internacional Instituto del Agua (SIWI), Consejo Mundial del Agua en Alemania, Centro Nacional de Investigación del Agua de Egipto.	2022	Secretaría y Miembros
2	Facilitar el desarrollo e intercambio de conocimientos sobre deltas, resiliencia, desarrollo sostenible de deltas urbanos y rurales	3. Revisar, seleccionar y compartir buenas prácticas de proyectos de gestión y adaptación al cambio climático sobre los deltas	2022	Miembros
		4. Presentar anualmente las buenas prácticas de cada país miembro durante la Conferencia Ministerial y Reuniones del grupo de trabajo	2022	Secretaría y Miembros
		5. Revisar y compartir desafíos y soluciones en espacios de intercambio como los realizados por Global Water Partnership (GWP), Iniciativa en Myanmar-Bangladesh y mostrar buenas prácticas en el boletín durante seminarios web y sesiones de trabajo con diferentes países miembros	2022	Miembros



Financing of ProCAD



Ambiente



Ministerie van Infrastructuur
en Waterstaat



Reino de los Países Bajos



Rijksdienst voor Ondernemend
Nederland



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ProCAD
Jun-Dec 2021

Financing of BuildCAD

Memorandum of Understanding
(20 year)



Ministerie van Infrastructuur
en Waterstaat

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Ambiente



Reino de los Países Bajos



BuildCAD
Mar 2023

ProCAD – Projects and Capacities in Colombian Deltas

- ProCAD aimed to help the Ministry of Environment of Colombia (MADS) to:
 - Identify and prioritise existing formulated projects of climate adaptation in three coastal deltas in Colombia
 - Identify knowledge gaps and capacity needs
 - Promote collaboration with Argentina, in particular via Delta Alliance / Delta Coalition (a direct request by MADS)



Rijksdienst voor Ondernemend
Nederland

NL team:

L. Alfonso
U. Wehn
A. Dastgheib
A. Bilbao

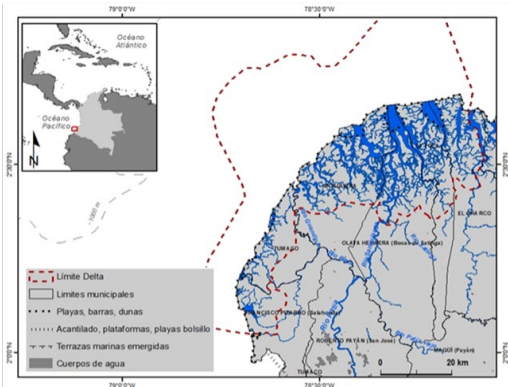
Colombian team:

Alexandra Arévalo
Cristina Pereira
Carol Salcedo
Adriana Puello

ProCAD

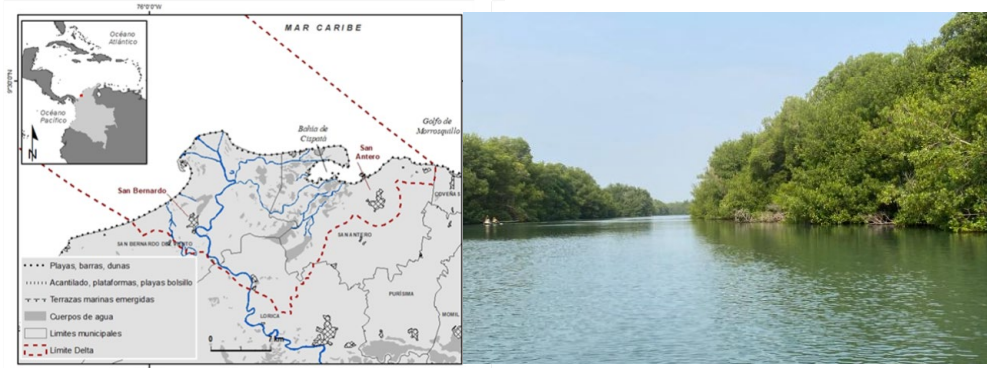


Patía



1. El Charco
2. Francisco Pizarro
3. La Tola
4. Mosquera
5. Olaya Herrera

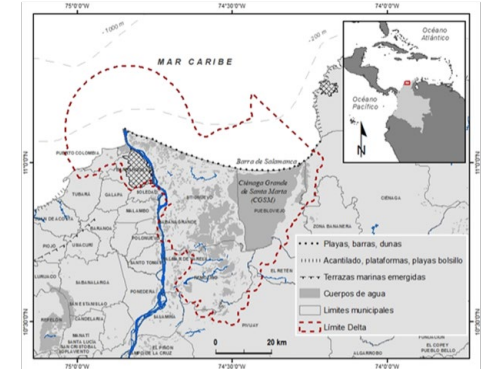
Sinú



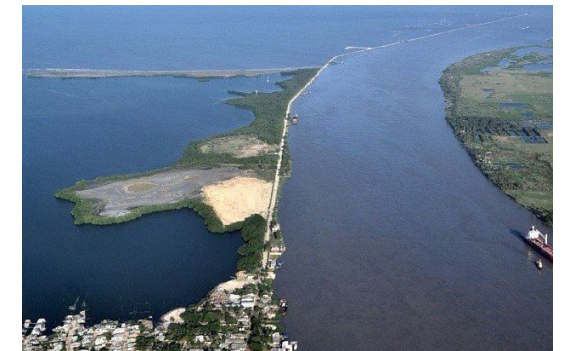
1. San Antero
2. San Bernardo del Viento



Magdalena



1. Ciénaga
2. Puebloviejo
3. Remolino
4. Sitionuevo
5. Barranquilla
6. Puerto Colombia



Projects' prioritisation

Collection of projects – criteria for selection – application of criteria

Enfoque de ACC y GRD en ecosistemas costeros

Característica	Puntaje
AbE	2
AbC	
Manglar	2
Laguna costera	

Respuesta a principales necesidades de adaptación al CC

Relación con indicador TCNCC	Puntaje
Estado de salud y prioridad de restauración de Ecosistema Manglar (SE)	5

Contribución a los instrumentos de planeación

Característica	Puntaje
PIGCCT	4
PDGRD	
NDC	1
PNGRD	

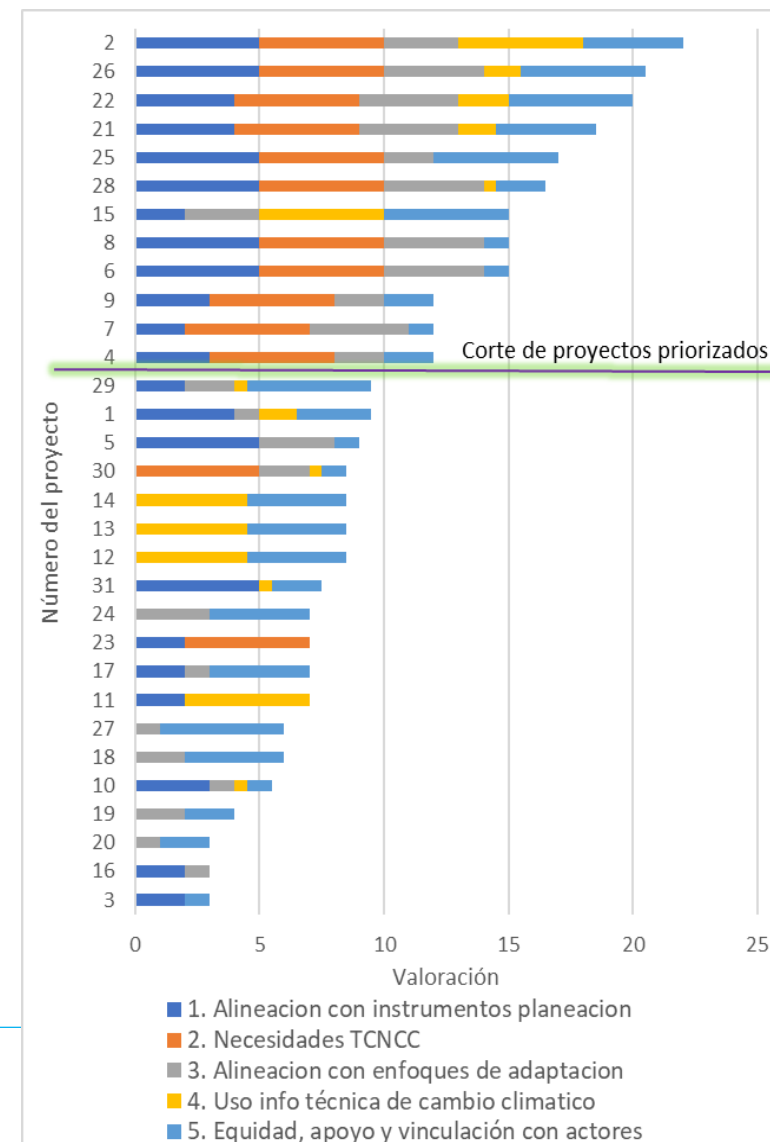
Tipo de información de soporte

Información de soporte	Puntaje
Estudios técnicos de entidades reconocidas	1,5

Equidad y vinculación con actores

Característica	Puntaje
Beneficios para grupos de población vulnerable	3
Acuerdos y gestión con otras entidades	1
Socialización con comunidades, beneficiarios, entidades y otros	1

Total: 20,5

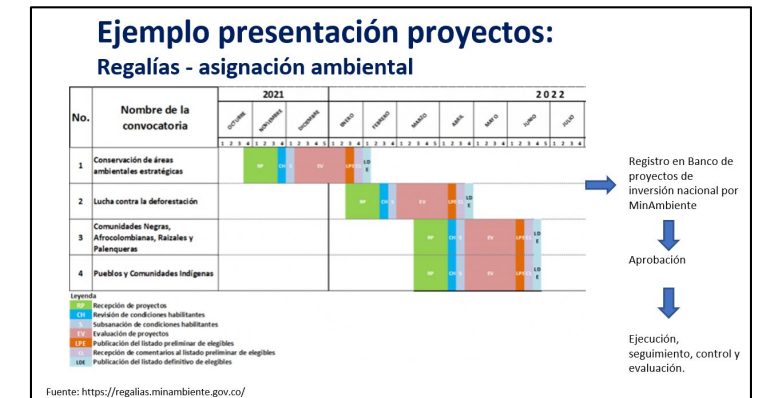


Communication of possible financial sources

Sources



Example of procedures to apply



Examples national and international funds

Ejemplos de fuentes de recursos

Nacionales

Nombre	Temas de los proyectos	Quién puede presentarlos	Mecanismo de presentación	Monto
Regalías – Asignación ambiente	Sostenibilidad y mitigación del cambio climático, biodiversidad, conocimiento y prevención para GRD y ACC, instituciones ambientales modernas	Entidades públicas y comunidades étnicas	Convocatorias periódicas de MinAmbiente y DNP https://regalias.minambiente.gov.co/	\$154.276 millones total para 2021–2022
Regalías - Ciencia, tecnología e innovación ambiental	Temas prioritarios de cada departamento definidos por los Consejos Departamentales de Ciencia, Tecnología e Innovación (CTel)	Entidades reconocidas por Colciencias, entidades territoriales con experiencia en CTel	Convocatorias MinCiencias https://minciencias.gov.co/pl-an-convocatorias-astci-2021-2022	\$246.842 millones CTel de Ambiente y Desarrollo Sostenible 2021–2022
Fondo de Compensación Ambiental	Funcionamiento, inversión y servicio de la deuda de las corporaciones beneficiarias	15 Corporaciones autónomas de menor presupuesto total vigente	A través del Sistema unificado de inversión y finanzas públicas (SUIFP)	Varía cada año según los aportes de las CAR de mayores ingresos

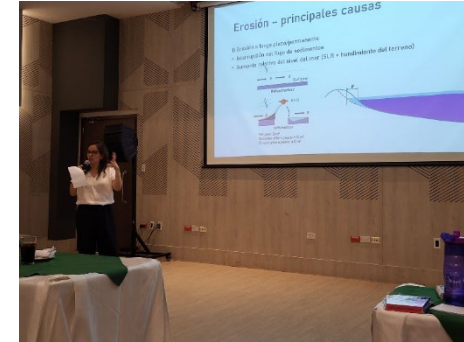
Ejemplos de fuentes de recursos

Cooperación internacional para la escala local

Nombre	Temas de los proyectos	Quién puede presentarlos	Mecanismo de presentación	Monto por proyecto
Iniciativa climática internacional (IKI)	Prioridades de las conferencias de las naciones unidas cambio climático y biodiversidad	Entidades territoriales Organizaciones comunitarias, ONG	Cambia según las convocatorias, que se realizan cada año	22.000 a 900.000 USD
Fondo Francés para el ambiente	Agricultura, silvicultura y uso del suelo, SbN, océanos y costas	Entidades territoriales Organizaciones comunitarias, ONG	Presentar ideas de proyectos a una de las 6 instituciones del Fondo	No indica
Fondo Regional para la tecnología agropecuaria (FONTAGRO)	Innovación en agricultura familiar, competitividad y seguridad alimentaria	Entidades públicas nacionales y subnacionales	Convocatorias anuales en la página web: https://www.fontagro.org/en/	Max. 200,000 USD

BuildCAD

- Disseminate the results of the ProCAD project to the communities and authorities of the deltas
- Get feedback on results and possible next steps in a participatory way
- Sharing experiences international researchers in adaptation

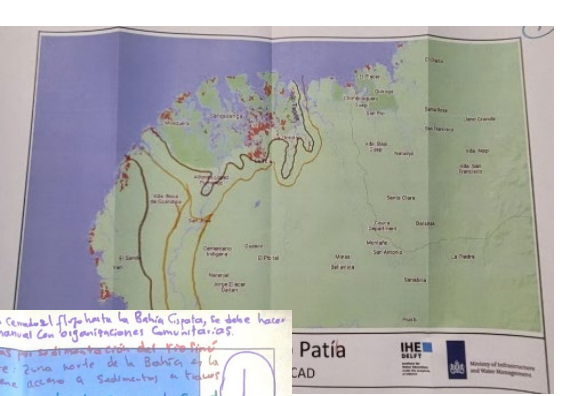


Team:

Leonardo Alfonso
Alexandra Arévalo
Aleyda Ortega
Adriana Botero
Monica Parra

BuildCAD





1. Caso grande: Estación sedimentaria en 7 Km y 14 Km Central flujante la Bahía Cuyales, se debe hacer extracción de Bioturbia Solamente manual con Organizaciones Comunitarias.

2. Boca de Lora y Mitoña con Canales por sedimentación del Río Sinú.

3. Sector la Honda, Matizo y de Monte, zona norte de la Bahía, es la zona más erosionada pero también tiene acceso a Sedimentos a través del río Sinú.

4. Crear la Corona bajo sobrepoblamiento de tumbos que acaba con el Manguar.

5. Formación de Salitral en la zona Norte de la Bahía.

Grupo trabajo:
APRACAS
Alcalde San Antero
ASOMAGTIC
ASOMASAN
Cali Campesino

Delta del Río Sinú
Proyecto BuildCAD

MINISTERIO DE AMBIENTE Y DESARROLLO SOSTENIBLE | IHE Delft | Ministry of Environment and Water Management



1



Dicen expresos... son por... los incidentes locales los... especies...
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Delta del Río Sinú
Proyecto BuildCAD

MINISTERIO DE AMBIENTE Y DESARROLLO SOSTENIBLE | IHE Delft | Ministry of Environment and Water Management

CLIMATE CENTRAL

CHOOSE MAP

COASTAL RISK SCREENING TOOL

LAND BELOW 1.0 METERS OF WATER

A water level of 1.0 meters above the high tide line could be reached through combinations of sea level rise, tides, and storm surge.

DETAILS AND LIMITATIONS

WATER LEVEL 1.0 m

Meters Feet

CHANGE OTHER SETTINGS

Coastal Futures (CoFu)

A one stop viewer for 21st century projections of climatic impact-drivers (CIDs) leading to coastal impacts and risk (including coastal CID data sets assessed in IPCC AR6 WGI)

Regional Sea Level Change

→ Go to page

Extreme Sea Level

→ Go to page

Coastal Flooding

→ Go to page

Shoreline Change

→ Go to page

Extreme Waves

→ Go to page



2100 - 1.0m

2040 - 50cm

Findings / lessons learned

- Local communities tend to focus on their immediate problems
 - Basic needs are not covered, including safe drinking water, food, connectivity
 - Therefore, short-term future climate problems are secondary
- Working with local experts pays off
 - Local professionals can work in their context, have local knowledge, networks
 - Tariffs of local expert ~5 times European / Dutch tariffs
- Building capacities in formulation of proposals is essential
 - A recurrent problem at different scales
 - Encourage communities to work with universities to formulate proposals



www.un-ihe.org

PRIORITIZING CLIMATE ADAPTATION INVESTMENT IN ACCRA, GHANA

From Risk Assessment to Project Identification

MAY 2023

Christopher J. Chung (Senior Urban Specialist, GCA)



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Challenge

- Delta as unique geography – sea, river, low-lying geography (similar exposures)
- Climate change is a daily reality in Accra
 - Flooding
 - Coastal Erosion
 - Water Scarcity
- Disproportionate impact on the most vulnerable (e.g. informal settlements)
 - Riverside and coastal communities
 - Flood plains

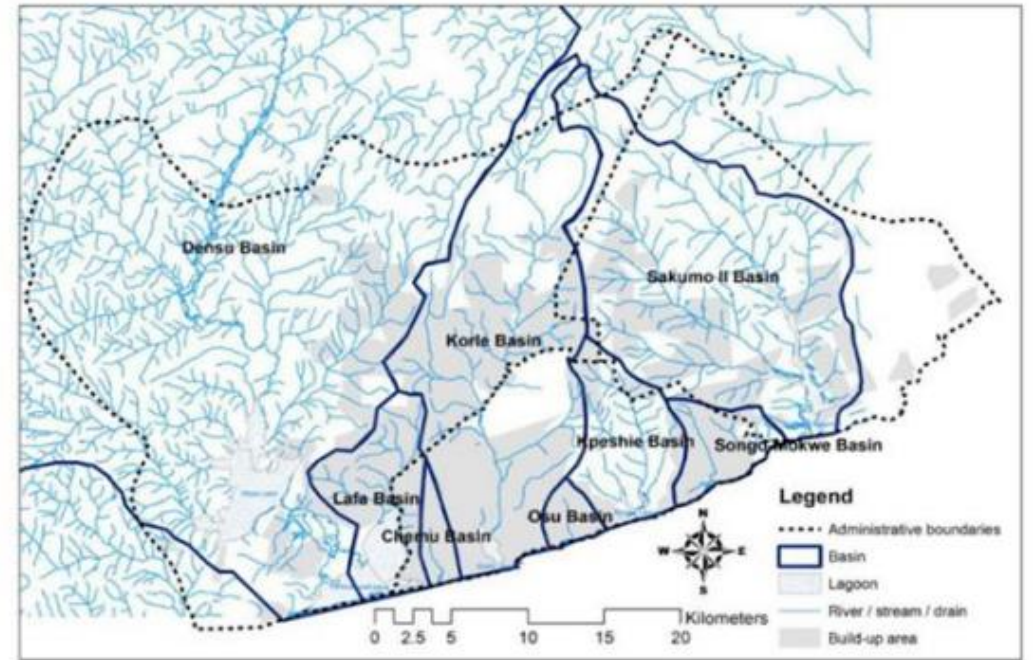


Figure 1: River Catchments of Greater Accra Region



Figure 4: Elevation of (core) of Accra Metropolis

Climate Vulnerability Stats

○ Flooding

- If no intervention in Accra, expected annual damage (EAD) due to flooding expected to increase 16% (\$106 Million in 2000s → \$124 Million in 2030s)

○ Coastal Erosion

- Between 2005 – 2014, average rate of erosion 0.54 m / year
- By 2050, 615k+ m² will be inundated due to sea level rise (and will increase to 2.1 million+ m² by 2080)
- By 2080, shoreline will advance inland 52 m (on average) and some areas 161 m (Glefe Area)



Glefe area eroding over 161 m from 2014 position

○ Water Scarcity

- Water infrastructure highly climate vulnerable (flooding)
- Sufficient water per capita but projected climate variability can jeopardize widespread availability

50-year Return Period (2000s)



50-year Return Period (2050s RCP8.5)



Process / Timeline



Risk Assessment

May 2021 - April 2022

- Climate Analysis (precipitation, temperature extremes)
- Coastal Erosion Modeling
- Flood Modeling
- Hazard Exposure and Risk Estimation of Compound Flooding
- Participatory Hazard, Vulnerability and Capacity Assessment

Gap Analysis

August 2022 -
December 2022

- Current state and desired state of water-related infrastructure
- Challenges and opportunities in water-related climate adaptation
- Menu of bankable investment options
- Cost-estimation of identified options

Investment Prioritization

January 2023 –
February 2023

- Validation workshops with national and municipal stakeholders
 - Accra Metropolitan Assembly
 - Regional Coordination Council (RCC)
 - National ministries
- Prioritized Climate Adaptation Investment List
- Pitchbook for investors (MDB, donors, private sector)

Investment Opportunities

Summary

- Scope: GAMA+ (Greater Accra Metropolitan Area + adjacent river catchment areas)
- 20 project ideas identified, organized into 6 climate adaptation priorities; concept proposals prepared
 - Coastal Protection & Climate Resilience
 - Flood Forecasting & Early Warning
 - Densu River Basin + Delta Adaptation
 - Climate Resilient Water Supply
 - Low-Income Urban Community (LIUC) Revitalisation & Adaptation
 - Urban Drainage & Resilience
- Total investment required: US\$ 466.6 million
- Third-party investment opportunity: US\$ 378 million
- Project development investment: US\$ 23.3 million.

	Project Costs		Investment Opportunity	
	Development Phase	Full Project	Development Phase	Full Project
	million US\$	million US\$	Million US\$	million US\$
1. Coastal Protection & Climate Resilience	7.8	156.2	7.8	130.0
2. Flood Forecasting & Early Warning	0.6	12.9	0.6	8.0
3. Densu River Basin + Delta Adaptation	3.6	72.6	3.6	60.0
4. Climate Resilient Water Supply	5.2	103.5	5.2	80.0
5. LIUC Revitalisation and Adaptation	2.9	57.4	2.9	45.0
6. Urban Drainage & Resilience	3.2	64.0	3.2	55.0
Total (million US\$)	23.3	466.6	23.3	378.0

3. DENSU BASIN + DELTA CLIMATE ADAPTATION

Project rationale

- Soil erosion in upper Densu basin leading to siltation of Weija reservoir → lower storage capacity, water scarcity
- Release of flood waters and encroachment of lower Densu floodplain → increased flood risk of downstream communities

Strategic Direction

- Need to strengthen upper Densu basin soil erosion control
- Downstream protective measures and adjusted dam releases should be implemented to reduce downstream flood risk.

Beneficiaries

- People, businesses and assets located in upper and lower Densu basin, especially low-income communities in flood plains.

Gender considerations

- Reduction of floods in Densu floodplain will positively impact women in the area as impact on households will be less severe.

Potential climate mitigation co-benefits

- Climate mitigation co-benefits could arise from restoration of floodplain and coastal wetlands and related carbon sequestration in (semi)natural ecosystems.



3. DENSU BASIN + DELTA CLIMATE ADAPTATION

Project Parameters			
Project Type	Densu River Basin and Delta Climate Adaptation through IWRM	Size	Densu river basin size: 2,490 km ² Floods extension: ca. 250 km ²
Location	GAMA and Densu basin	Development Status	<ul style="list-style-type: none"> • Initial ○ Early ○ Mid ○ Late
Potential beneficiaries	0.6 million people	Lead Government Agency	Lead: Water Resources Commission Supporting: Hydrological Services Authority, Minister Works and Housing, Ministry Lands and Natural Resources, MMDAs - Metropolitan, Municipal and District Assemblies
Initial Estimated Total Project Costs	CAPEX: US\$ 72.6 million Development Phase: US\$ 3.6 million	Total External Funding Required	CAPEX: US\$ 60 million Development Phase: US\$ 3.6 million



3. DENSU BASIN + DELTA CLIMATE ADAPTATION

Description

Component 1. Densu Upper Catchment & Weija Reservoir - Reforestation, Runoff & Sediment Control

- 1.1 Assessment of sources of sediment entering the Weija reservoir (i.e., slopes, farms, farmland, mining areas, riparian zones, river channels) (using DTM, modelling, field surveys)
- 1.2 Pre-feasibility of erosion control and sediment reduction from the main sources of sediment (modelling, field survey)
- 1.3 Feasibility and detailed design of a sediment control programme (i.e., riparian zone conservation, farm run-off control actions, reforestation) and ESIA
- 1.4 Stakeholder consultations and design of community development programme
- 1.5 Implementation of Densu basin erosion and sediment control programme (5 years)

Projected Outcome

- Enhanced understanding of current and future anticipated opportunities for sediment control options in the upper Densu basin
- Increased climate resilience due to implementation of sediment control measures in the upper Densu basin

Component 2. Lower Densu Basin Flood Risk Reduction: Spatial Planning, Enforcement and Nature-based Solutions Infrastructure

- 2.1 Update spatial planning for Weija Assembly, especially the Densu floodplain
- 2.2 Prepare (pre-)feasibility study for floodplain rehabilitation and protection (incl. ESIA)
- 2.3 Implement key flood defence interventions on critical locations between Weija Dam and Densu Delta Ramsar Site (incl. channel deepening, use of dikes and levees and wetlands for water storage, dump-site lining)

Projected Outcome

- Enhanced understanding of current and future anticipated opportunities for flood risk reduction in the upper Densu basin
- Increased climate resilience due to implementation of flood control and management measures in the lower Densu basin

3. DENSU BASIN + DELTA CLIMATE ADAPTATION

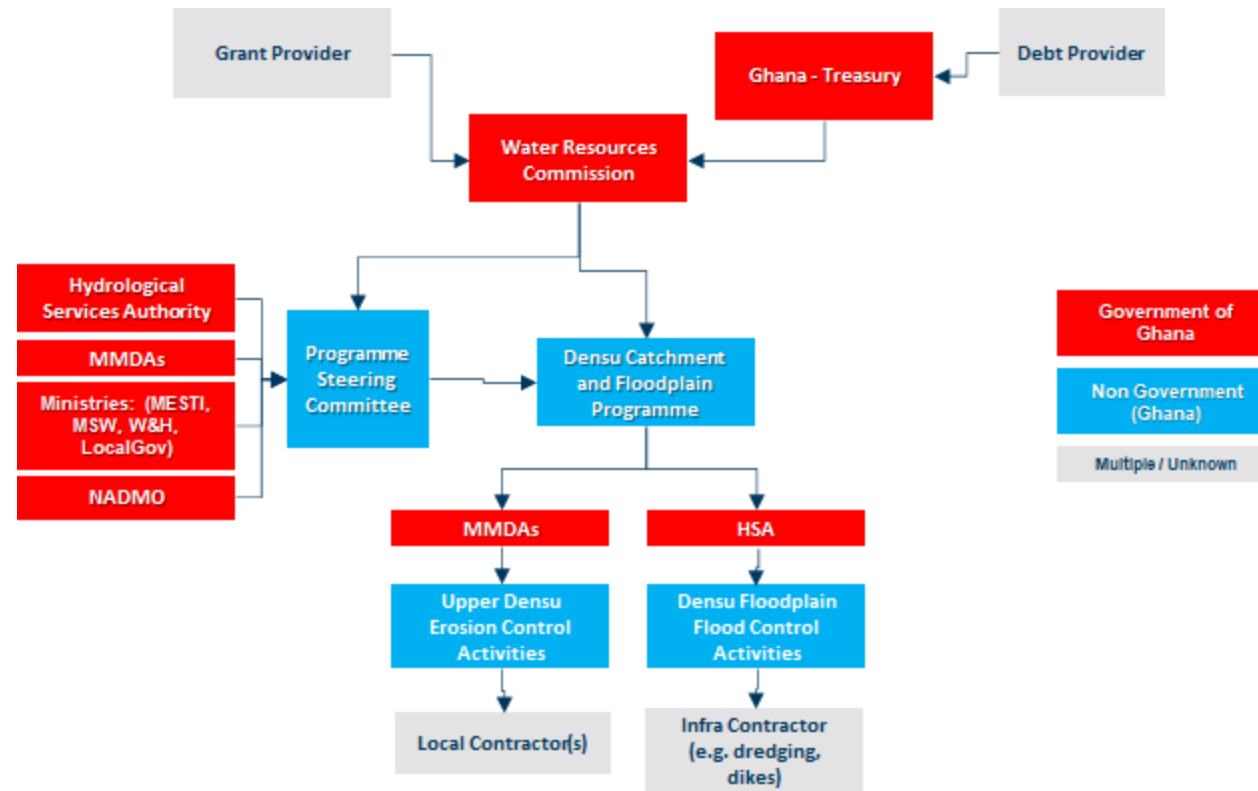
Budget: US\$ 72.6 Million

	CAPEX Total	5-Year Running Costs Total	Grand Total
	US\$	US\$	US\$
Component 1. Densu upper catchment & Weija reservoir - reforestation, runoff & sediment control	26,218,800	3,735,000	29,953,800
1.1 Assessment of sources of sediment entering the Weija reservoir	75,000		
1.2 Pre-feasibility of erosion control and sediment reduction	75,000		
1.3 Feasibility and detail design of a sediment control programme and ESIA	250,000		
1.4 Stakeholder consultations and design community development programme	100,000		
1.5 Implementation of Densu basin erosion and sediment control & community development programmes (5 years)	25,718,800	3,735,000	

Component 2. Lower Densu basin: flood risk reduction	37,690,000	450,000	38,140,000
2.1 Update spatial planning for Weija Assembly, especially the Densu floodplain	150,000		
2.2 Prepare (pre-)feasibility study for floodplain rehabilitation and protection (incl. ESIA)	500,000	-	
2.3 Implement key flood-defence interventions on critical locations between Weija dam and Densu Delta Ramsar Site (3 years)	37,040,000	450,000	
Total	63,908,800	4,185,000	68,093,800
Development phase			1,150,000
Management fee		3,404,690	3,404,690
Grand Total			72,648,490

3. DENSU BASIN + DELTA CLIMATE ADAPTATION

Institutional Set-up



Development Timeline

Milestone	Erosion Sources Study	Pre-Feasibility Studies	Feasibility Studies	Project Design	RFP	Contractor Selection	Contract(s)
Time (month)	6	9	15	15	18	21	24

Quick Lessons Learned

- **SCOPE:** Deltas relationship with rivers requires understanding and addressing challenges at a basin level
- **GEOGRAPHY:** Similar challenges identified across deltas globally: (a) flooding, (b) coastal erosion, (c) water scarcity
- **JURISDICTIONS:** Involves understanding interlinkage between municipal, regional and national government actors – this often determines ability to access and implement finance. It's not just about money, but often about institutions.
- **FINANCE:** Understanding revenue generation potential of investments help identify appropriate financiers (e.g. government/MDB, donor, private finance).



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