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

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.

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.
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
Climate adaptation in the Netherlands, financing the Delta Programme

May 26, 2023

Peter C.G. Glas MSc LLM
Delta Programme Commissioner
The Netherlands, a delta country
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

26 May 2023
Government Water Institutions: Main Structure

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

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

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

Sewage system, storm water collection and urban groundwater level

European Union

12 Provinces

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

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

Drinking water production and supply

342 Municipalities

21 Regional Water Authorities

10 Public Drinking Water Companies

27 October 2015
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 Adapative 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
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
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.
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.

Bottom-up approach
The project ideas are developed in discussion with local communities who are vulnerable.

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

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.

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.

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?

KFW → BRAC → CBF → BGTB

Bangladesh Government Treasury Bond

EUR 11.735 Million

BDT 1100 Million

In addition BRAC Contribution BDT 190 Million

CY 2020

90% Investment

Amount to be replenished every year

Income for Project & Operational Cost

BRAC: 50%

NGOs: 50%

CY 2021

90% Investment

Amount to be replenished

Income for Project & Operational Cost

BRAC: 50%

NGOs: 50%

CY 2022

90% Investment

Amount to be replenished

Income for Project & Operational Cost

BRAC: 50%

NGOs: 50%

CY 2023

90% Investment

Amount to be replenished

Income for Project & Operational Cost

BRAC: 50%

NGOs: 50%

Investment and use of fund flows

Investment and use of fund flows
## How does CBF works now?

<table>
<thead>
<tr>
<th>Major Stakeholders</th>
<th>BRAC</th>
<th>KFW</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Legal partner for Financing Agreement</td>
<td>Development partner</td>
</tr>
<tr>
<td></td>
<td>Settlor of the Fund.</td>
<td>Provide no objection</td>
</tr>
<tr>
<td></td>
<td>Employer of the Trustees</td>
<td>Progress review and fiduciary supervision</td>
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</table>

<table>
<thead>
<tr>
<th>Principal Organs</th>
<th>Board of Trustees</th>
<th>ACCF</th>
<th>CBF Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All strategic decisions</td>
<td>Advises the trustees on strategic decisions</td>
<td>Overall coordination, administration, effective and efficient management of fund and implementation</td>
</tr>
<tr>
<td></td>
<td>Oversee fund management investment and disbursement</td>
<td>Selection of funded projects / awards grants</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementing Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement the funded project</td>
</tr>
<tr>
<td>Monitor and report to the Fund Secretariat on progress of the funded projects</td>
</tr>
<tr>
<td>Ensure that the grant is prudently managed and solely used for project purposes</td>
</tr>
</tbody>
</table>
**Project Selection Processes: How priorities are set? Who approves the budget?**

**Call for Concept Note**

- Submission of concept note to CBF Secretariat using approved template

**Technical review, conducts on-site due diligence and submission of top ranked project ideas to ACCF for recommendation**

**ACCF reviews and recommends for next step**

**CBF Trustee Board Approves the concept notes**

**Result of concept note selection and request for detailed proposal**

**Submission of detailed proposal in the ACCF approved template along with annexes**

**Final review and submission of selected projects for ACCF recommendation and no objection form KfW**

**Final Approval from the Trustee Board and announcement of the results**

**BRAC website**

**Local and National News Paper (Bengali and English)**

**Briefing with NGOs**

**Project implementation, Monitoring and Evaluation**

- [Image] BRAC website
- [Image] Local and National News Paper (Bengali and English)
- [Image] Briefing with NGOs
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!
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
• 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
• 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
  • ...
Financing of ProCAD

Ambiente ↔ Ministerie van Infrastructuur en Waterstaat ↔ Reino de los Países Bajos

Rijksdienst voor Ondernemend Nederland

IHE Delft—Institute for Water Education under the auspices of UNESCO

ProCAD
Jun-Dec 2021
Financing of BuildCAD

Memorandum of Understanding (20 year)

Ministerie van Infrastructuur en Waterstaat

IHE DELFT Institute for Water Education under the auspices of UNESCO

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)

NL team:
L. Alfonso
U. Wehn
A. Dastgheib
A. Bilbao

Colombian team:
Alexandra Arévalo
Cristina Pereira
Carol Salcedo
Adriana Puello
ProCAD

Sinú

1. San Antero
2. San Bernardo del Viento

Magdalena

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

Patía

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

Special deltas
Projects’ prioritisation

Collection of projects – criteria for selection – application of criteria

Enfoque de ACC y GRD en ecosistemas costeros

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<tr>
<th>Característica</th>
<th>Puntaje</th>
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<tr>
<td>ABc</td>
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<td>ABC</td>
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<tr>
<td>Manglar</td>
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<tr>
<td>Laguna costera</td>
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Respuesta a principales necesidades de adaptación al CC

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<th>Relación con indicador TCNCC</th>
<th>Puntaje</th>
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<tr>
<td>Estado de salud y prioridad de restauración de Ecosistema Manglar (SE)</td>
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Contribución a los instrumentos de planeación

<table>
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<td>PDGRD</td>
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<td>NDC</td>
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<td>PNGRD</td>
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Tipo de información de soporte

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<th>Información de soporte</th>
<th>Puntaje</th>
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<td>Estudios técnicos de entidades reconocidas</td>
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Equidad y vinculación con actores

<table>
<thead>
<tr>
<th>Característica</th>
<th>Puntaje</th>
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<tr>
<td>Beneficios para grupos de población vulnerable</td>
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<tr>
<td>Acuerdos y gestión con otras entidades</td>
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<tr>
<td>Socialización con comunidades, beneficiarios, entidades y otros</td>
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Total: 20,5

Corte de proyectos priorizados

Número del proyecto

Valoración

- 1. Alineacion con instrumentos planeacion
- 2. Necesidades TCNCC
- 3. Alineacion con enfoques de adaptacion
- 4. Uso info técnica de cambio climatico
- 5. Equidad, apoyo y vinculacion con actores
**Communication of possible financial sources**

### Sources

**Fuentes de recursos viables por tipos de proyectos**

1. **Rehabilitación de la conectividad hidráulica**
   - **Regalías ambientales**
   - **Regalías hidráulicas**

2. **Integración**
   - **Fomento al uso de recursos hidráulicos**

3. **Consecuencias y uso de la información**
   - **Consecuencias y uso de la información**

### Example of procedures to apply

**Regalías – asignación ambiental**

1. Registro en el Plan de proyectos de inversión realizado por Medioambiente
2. Aprobación
3. Implementación

### Examples national and international funds

#### Ejemplos de fuentes de recursos

**Nacionales**

<table>
<thead>
<tr>
<th>Nombre</th>
<th>Tema del proyecto</th>
<th>Tipo de proyectos</th>
<th>Mecanismo de presentación</th>
<th>Muestra</th>
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<tbody>
<tr>
<td>Regalías – asunción ambiental</td>
<td>Capacitación</td>
<td>Regalías</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
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<tr>
<td>Regalías – Ciencia, tecnología e innovación ambiental</td>
<td>Economía</td>
<td>Regalías</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
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<tr>
<td>Regalías – Consecuencias y uso de la información</td>
<td>Medioambiente</td>
<td>Regalías</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
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**Internacionales**

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<th>País</th>
<th>Mecanismo de presentación</th>
<th>Muestra</th>
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<tr>
<td>Banco Interamericano de Desarrollo (BID)</td>
<td>Coordinación con las naciones en desarrollo</td>
<td>BID</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
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<tr>
<td>Fondo Mundial para el Medioambiente</td>
<td>Agricultura, pescado y uso del suelo, ODM, exámenes del nivel</td>
<td>ODM</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
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<tr>
<td>Fondo Regional Interamericano para el Medioambiente (FOMAE)</td>
<td>Innovación en agricultura</td>
<td>ODM</td>
<td>Sistemas de información (SDI)</td>
<td>2013</td>
</tr>
</tbody>
</table>

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**Ejemplo presentación proyectos:**

- Regalías – asignación ambiental
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
Coastal Futures (CoFu)

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

Regional Sea Level Change
Extreme Sea Level
Coastal Flooding
Shoreline Change
Extreme Waves

Go to page
Go to page
Go to page
Go to page
Go to page
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
PRIORITIZING CLIMATE ADAPTATION INVESTMENT IN ACCRA, GHANA

From Risk Assessment to Project Identification

MAY 2023

Christopher J. Chung (Senior Urban Specialist, GCA)
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
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)

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

![Glefe area eroding over 161 m from 2014 position](image)
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.

<table>
<thead>
<tr>
<th>Project Costs</th>
<th>Investment Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Development Phase</td>
</tr>
<tr>
<td></td>
<td>million US$</td>
</tr>
<tr>
<td>1. Coastal Protection &amp; Climate Resilience</td>
<td>7.8</td>
</tr>
<tr>
<td>2. Flood Forecasting &amp; Early Warning</td>
<td>0.6</td>
</tr>
<tr>
<td>3. Densu River Basin + Delta Adaptation</td>
<td>3.6</td>
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<tr>
<td>4. Climate Resilient Water Supply</td>
<td>5.2</td>
</tr>
<tr>
<td>5. LIUC Revitalisation and Adaptation</td>
<td>2.9</td>
</tr>
<tr>
<td>6. Urban Drainage &amp; Resilience</td>
<td>3.2</td>
</tr>
<tr>
<td>Total (million US$)</td>
<td>23.3</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Project Parameters</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Project Type</strong></td>
<td>Densu River Basin and Delta Climate Adaptation through IWRM</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Densu river basin size: 2,490 km²; Floods extension: ca. 250 km²</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>GAMA and Densu basin</td>
</tr>
</tbody>
</table>
| **Development Status** | • Initial  
  o Early  
  o Mid  
  o 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**

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

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

| Grand Total | US$ 72,648,490 | | |
3. DENSU BASIN + DELTA CLIMATE ADAPTATION

Institutional Set-up

Development Timeline

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Erosion Sources Study</th>
<th>Pre-Feasibility Studies</th>
<th>Feasibility Studies</th>
<th>Project Design</th>
<th>RFP</th>
<th>Contractor Selection</th>
<th>Contract(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (month)</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
</tr>
</tbody>
</table>
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).
<table>
<thead>
<tr>
<th>Community Web Portal</th>
<th>Events Page</th>
<th>LinkedIn Group</th>
<th>Newsletter</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://communities.adaptationportal.gca.org/" alt="QR Code" /></td>
<td><img src="https://gca.org/gca-events/" alt="QR Code" /></td>
<td><img src="https://www.linkedin.com/groups/14262070/" alt="QR Code" /></td>
<td><img src="https://gca.us7.list-manage.com/subscribe?u=6dfa0ea942c9f12e85f30d962&amp;id=70f1cb250c" alt="QR Code" /></td>
</tr>
<tr>
<td>• Online space for articles and case studies, access content posted by others</td>
<td>• Register for events or watch event recordings</td>
<td>• Connect deeper and more informally with the other members with to share questions, resources &amp; opportunities</td>
<td>• Subscribe to the newsletter GCA Adaptation Update and the Water Adaptation Community Newsletter</td>
</tr>
</tbody>
</table>

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