CONNECTIVE CITIES

Federal Ministry
for Economic Cooperation
and Development

Mainstreaming climate adaptation in Mozambican urban water, sanitation and drainage sector

09 August 2021

Community of Practice for Sustainable Urban Development
Regional Network Sub-Saharan Africa

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Mainstreaming climate adaptation in Mozambican urban water, sanitation and drainage sector

An opportune assignment

- Exposed and vulnerable country
- Already (severely) impacted
- National climate policies
  - Least Developed Country – NAPA
  - National Climate Change Strategy
  - (i) Nationally Determined Contribution
  - National Disaster Risk Reduction Plan

➡ Adaptation commitments

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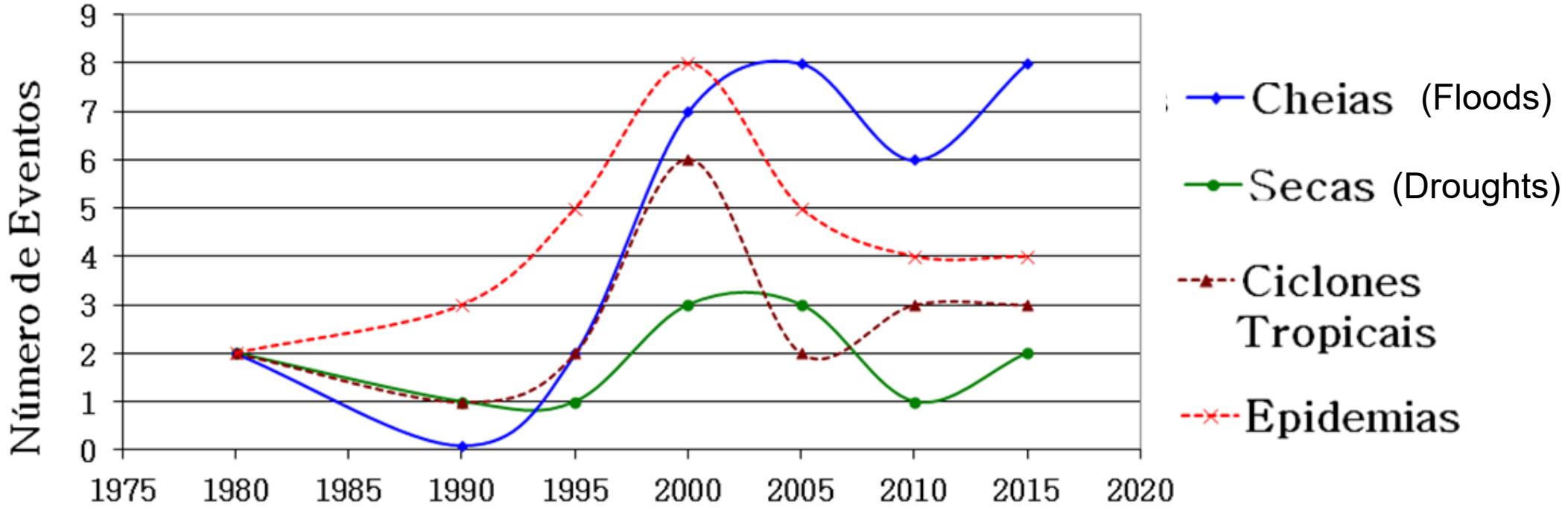
An opportune assignment

- Natural disaster records



An opportune assignment

- **Idai, Kenneth (March & April 2019)**
  - 2.8 million people affected
  - US$ 3.2 billion recovery and reconstruction

- **Extremely intense droughts**
  - 1.78 million people suffered severe food insecure between September and December 2018

- **Future climate may increase threat levels**

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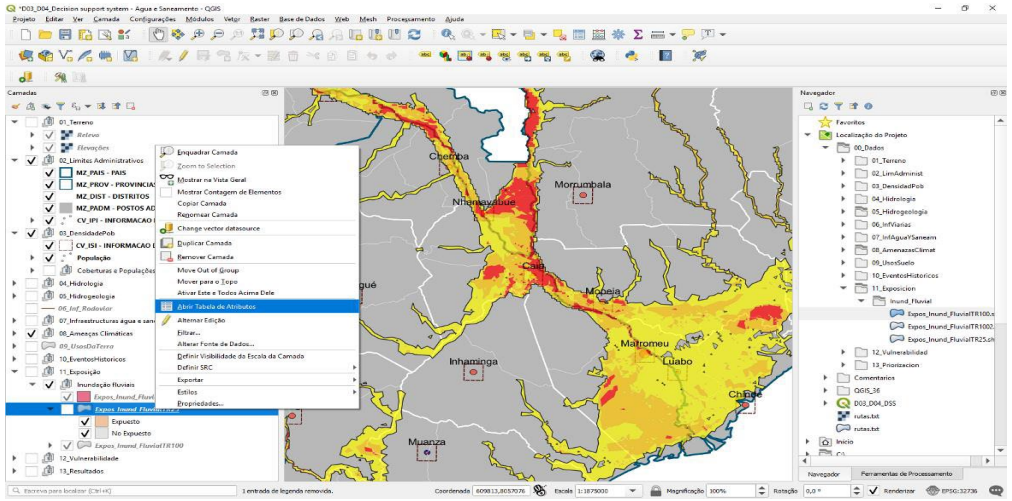
An opportune assignment

- **The Capacity Development Programme**
  - National Counterpart: *Administração de Infra-estruturas de Água e Saneamento* (AIAS)
  - Financing entity: Nordic Development Fund
  - Project duration: 26 months (Sep 17–Dec 19)
- **CDP's Scope**
  - Institutional strengthening
  - Capacity building
  - Resilient urban water management studies

AIAS
2 selected cities
(Beira and Matola)

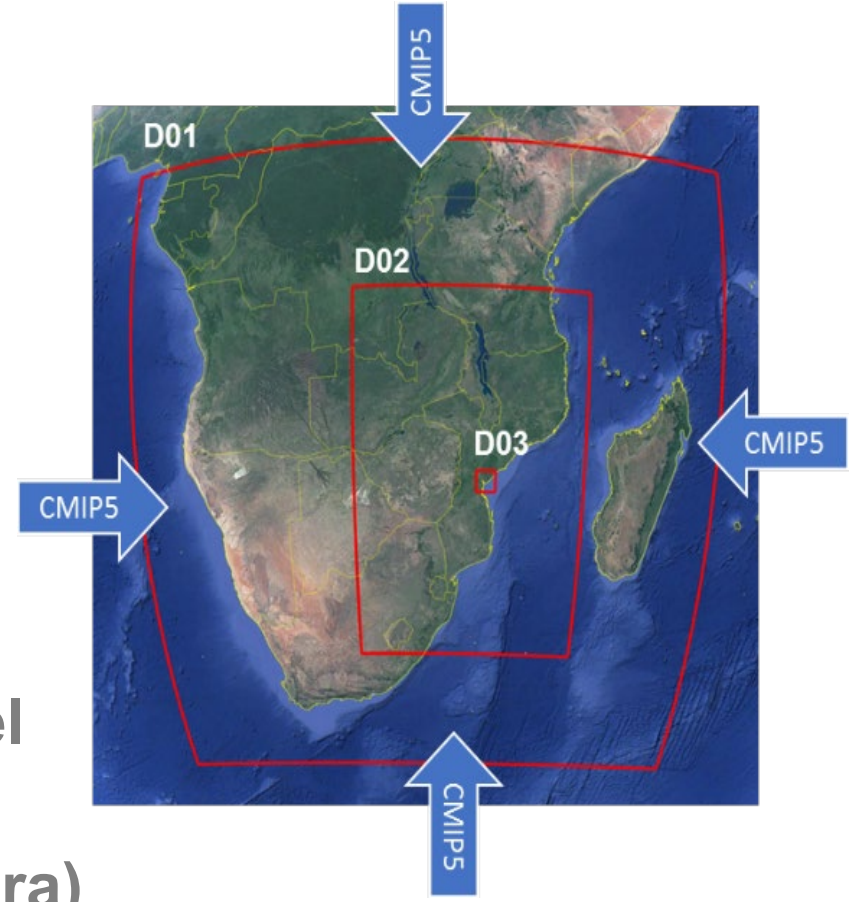
Institutional strengthening

- Stakeholder mapping exercise (role / influence)
- Interinstitutional cooperation agreements
- AIAS website
- GIS Decision Support System



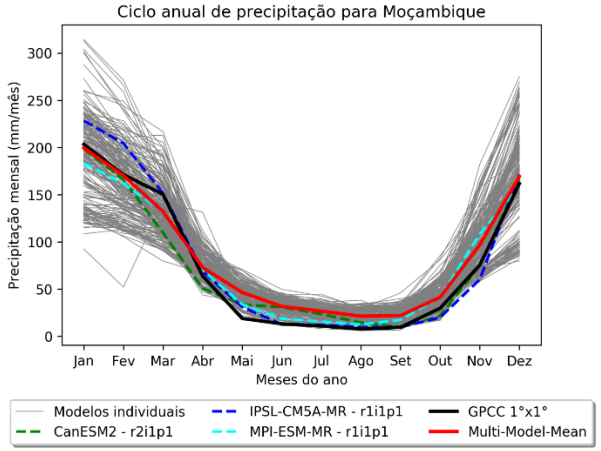
Capacity building

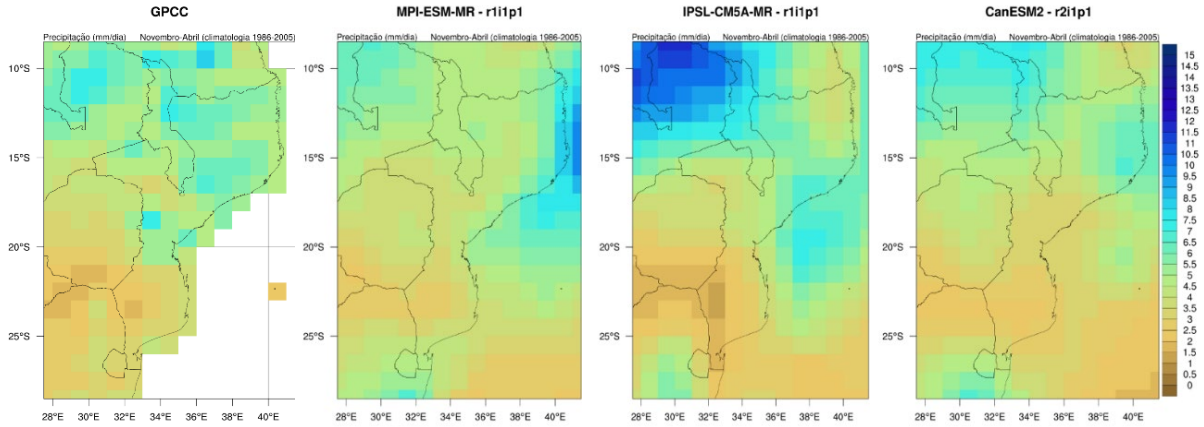
- **Climate modelling - Resources**
  - Lack of meteorological observations: Climate Forecast System Reanalysis (CFSR)
  - Global Climate Models (GCMs): Coupled Model Inter-comparison Project Phase 5 (CMIP5)
  - **Dynamic downscaling:** Weather Research and Forecast (WRF) model 3 nested domains: D01 (27x27km), D02 (9x9 km, Mozambique), D03 (3x3 km, Beira)



Capacity building

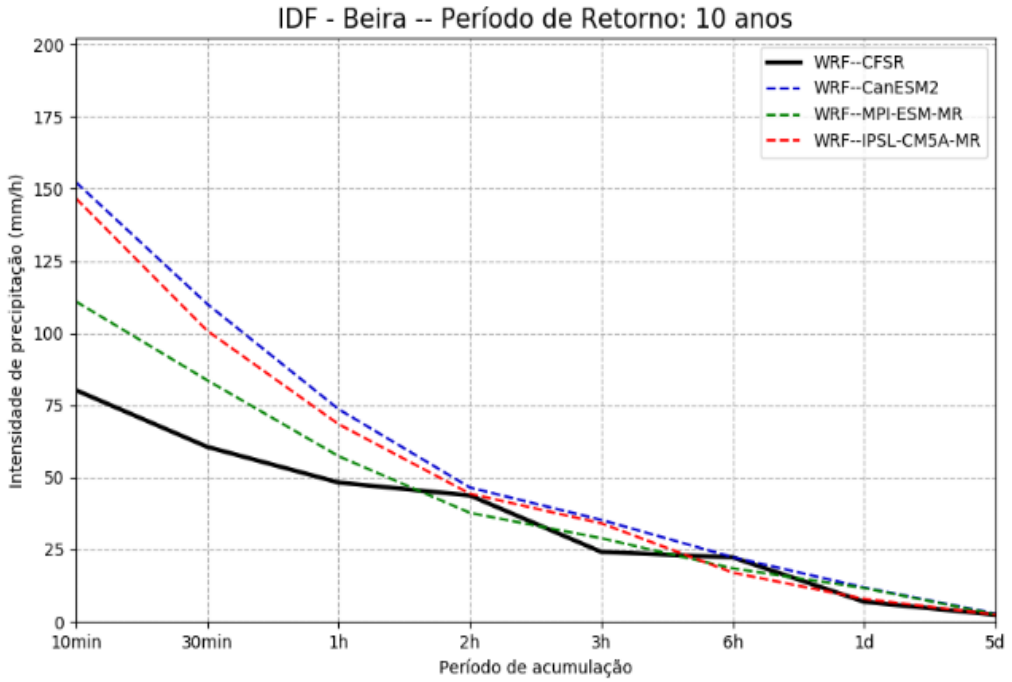
- ## Climate modelling - Configuration
  - Validation against the Global Precipitation Climatology Center (GPCC) precipitation dataset (3 CMIP5 models selected)
  - Historical/reference period: 1986-2005 (CFSR)
  - Future period: 2026-2045 (3 CMIP5 models)
  - RCP8.5





Capacity building

- **Climate modelling - Results**
  - Mean annual precipitation
  - Annual precipitation cycle
  - Dry spell (consecutive number of days with daily precipitation < 1 mm)
  - Intensity-Duration-Frequency (IDF) curves (10 minutes to multiple days; recurrences from 1 to 500 years)
  - Comparison historical vs future
  - Categorical results?



Capacity building

- Review of existing regulations, technical standards and norms and design criteria in water, sanitation and flood control
- Identify inconsistencies-gaps
- Include the adaptation component (upon modelling results)

Terça-feira, 1 de Julho de 2003 — I SÉRIE — Número 26

BOLETIM DA REPÚBLICA

PUBLICAÇÃO OFICIAL DA REPÚBLICA DE MOÇAMBIQUE

SUPLEMENTO

IMPRENSA NACIONAL DE MOÇAMBIQUE

AVISO

A matéria a publicar no «Boletim da República» deve ser remetida em cópia devidamente autenticada,

Regulamento dos Sistemas Públicos de Distribuição de Água e de Drenagem de Águas Residuais

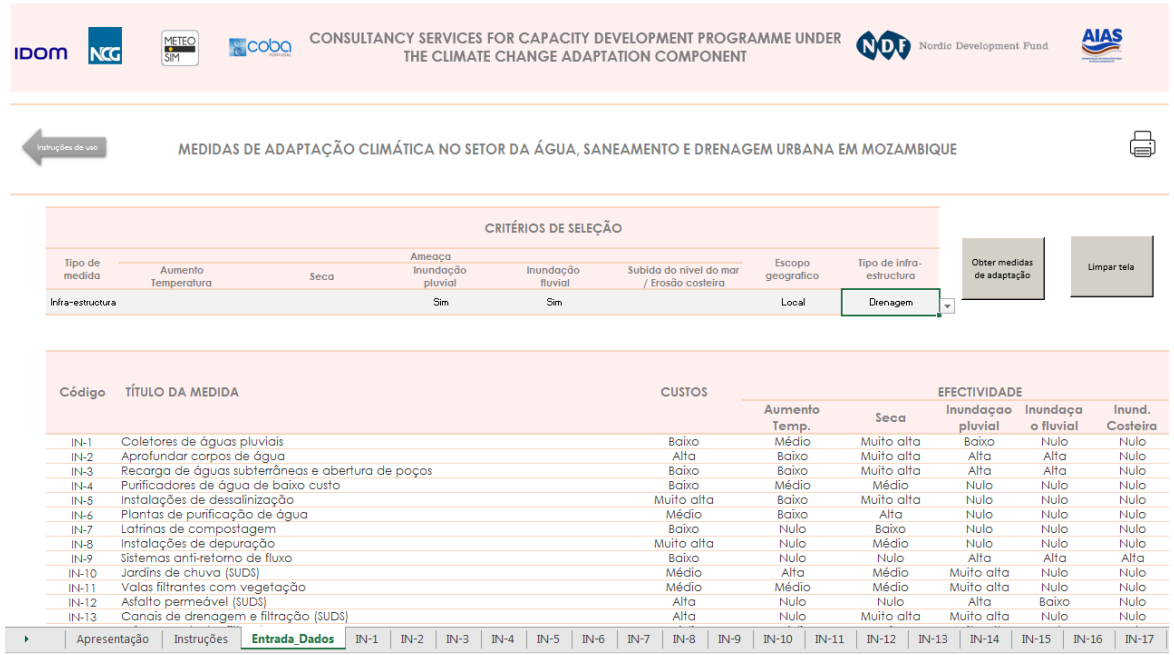
Título I - Disposições técnicas da distribuição pública de água

CAPÍTULO I

Generalidades

Capacity building

- Priority/decision making tool for investments on urban water management
- 47 adaptation measures (planning, design, O&M)
- Decision criteria: Vulnerability, Urgency, Synergy, No-regret, Efficacy, Feasibility, Flexibility and Cost-benefit



IDOM NCG METEO SIM coba CONSULTANCY SERVICES FOR CAPACITY DEVELOPMENT PROGRAMME UNDER THE CLIMATE CHANGE ADAPTATION COMPONENT NDF Nordic Development Fund AIAS

Instruções de uso

MEDIDAS DE ADAPTAÇÃO CLIMÁTICA NO SETOR DA ÁGUA, SANEAMENTO E DRENAGEM URBANA EM MOZAMBIQUE

CRITÉRIOS DE SELEÇÃO

Tipo de medida	Aumento Temperatura	Seca	Ameaça Inundação pluvial	Inundação fluvial	Subida do nivel do mar / Erosão costeira	Escopo geografico	Tipo de infra-estructura
Infra-estructura			Sim	Sim		Local	Drenagem

Obter medidas de adaptação | Limpar tela

Código	TÍTULO DA MEDIDA	CUSTOS	EFECTIVIDADE				
			Aumento Temp.	Seca	Inundaçao pluvial	Inundaçao fluvial	Inund. Costeira
IN-1	Coletores de águas pluviais	Baixo	Médio	Muito alta	Baixo	Nulo	Nulo
IN-2	Aprofundar corpos de água	Alta	Baixo	Muito alta	Alta	Alta	Nulo
IN-3	Recarga de águas subterrâneas e abertura de poços	Baixo	Baixo	Muito alta	Alta	Alta	Nulo
IN-4	Purificadores de água de baixo custo	Baixo	Médio	Médio	Nulo	Nulo	Nulo
IN-5	Instalações de dessalinização	Muito alta	Baixo	Muito alta	Nulo	Nulo	Nulo
IN-6	Plantas de purificação de água	Médio	Baixo	Alta	Nulo	Nulo	Nulo
IN-7	Latrinas de compostagem	Baixo	Nulo	Baixo	Nulo	Nulo	Nulo
IN-8	Instalações de depuração	Muito alta	Nulo	Médio	Nulo	Nulo	Nulo
IN-9	Sistemas anti-retorno de fluxo	Baixo	Nulo	Nulo	Alta	Alta	Alta
IN-10	Jardins de chuva (SUDS)	Médio	Alta	Médio	Muito alta	Nulo	Nulo
IN-11	Valas filtrantes com vegetação	Médio	Médio	Médio	Muito alta	Nulo	Nulo
IN-12	Asfalto permeável (SUDS)	Alta	Nulo	Nulo	Alta	Baixo	Nulo
IN-13	Canais de drenagem e filtração (SUDS)	Alta	Nulo	Muito alta	Muito alta	Nulo	Nulo

Apresentação | Instruções | Entrada_Dados | IN-1 | IN-2 | IN-3 | IN-4 | IN-5 | IN-6 | IN-7 | IN-8 | IN-9 | IN-10 | IN-11 | IN-12 | IN-13 | IN-14 | IN-15 | IN-16 | IN-17

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Capacity building

KAP methodology

Topic	Main contents
Climate change	Basic concepts. Causes and consequences. International action. Presentation of national public policies and achievements exposed by DINAB/MITADER representatives
GIS. Basic concepts	Main GIS features and utilities. Projections and coordinates systems Georeferecing. Raster and vector models. Spatial operations (geoprocessing). Layouts
Climate impacts on WASH systems	Climate risk concepts (Threats, Exposure, Vulnerability). WASH climate vulnerability. Adaptation measures.
GIS applied to hydraulic modelling	Digital elevation models. GIS hydrologic modules. Input data for hydraulic models. Outputs refinement
Climate modelling	Basic concepts on climatology and meteorology. General Circulation Models. Downscaling techniques (statistical, dynamic)
Urban adaptation planning	Urban planning relevance and concepts. Urban planning in Mozambique. Multidisciplinary approaches. Adaptation plans. Study cases: João Pessoa (Brazil) and Sevilla (Spain)
Adaptation measures	Sustainable Development Goals. Nature Based Solutions. Sustainable Urban Drainage Systems. Application in practice of the reviewed Regulation 30/2003, considering climate variability
Climate impacts on WASH systems	Hydrologic and hydraulic modelling. Application in practice, based on the completed drainage studies for Beira
Climate downscaling	Sharing of the obtained results from the climate modelling exercise. Operation guidelines for the climate database generated

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Resilient and sustainable urban development

- Beira and Matola
- Climate risk analysis
- Adaptation measures
- NbS / No-regret options
- Strengthening of autonomous water and sanitation entities

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Conclusions

- ✓ Climate impacts on urban systems are various and potentially severe
- ✓ Climate models show tendencies
- ✓ Promote no-regret options
- ✓ Urban resilience through Nature-based solutions
- ✓ Adaptation as a valid vehicle towards social cohesion
- ✓ Capacity building accelerate the process

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Recommendations and further steps

- Climate action approach to tackle climate concerns
- Synergies mitigation - adaptation
- Keep promoting interinstitutional coordination
- Hydrographic basin-level management
- Urban planning vs uncontrolled urban sprawl
- Urban adaptation plans (based on spatial risk analysis) as legal requirement

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INDUSTRY AND ENERGY	INFRASTRUCTURE	ARCHITECTURE	CONSULTING
OIL&GAS	COASTS AND PORTS	BUILDING	OPERATIONS AND LOGISTIC
RENEWABLE ENERGY	ROADS AND RAILWAYS	SUSTAINABILITY	CLIMATE CHANGE
ENVIRONMENTAL ENGINEERING	TELECOMMUNICATIONS	STRUCTURES	NATURAL CAPITAL
POWER AND TRANSMISSION	TRANSPORT. MOBILITY	PROJECT MANAGEMENT	COMPETITIVENESS, INNOVATION
MANUFACTURING	WATER CYCLE	CITIES	CIRCULAR ECONOMY

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Climate risk analysis and adaptation measure for Kenya's coastal infrastructure and communities

Threats, exposition and vulnerability mapping. Participatory approach

Urban re-qualification in Luanda

Urban Regeneration Plans for formal and informal settlements in eleven districts of the capital of Angola, on an action area that exceeds 2,800 hectares

Seawater desalination plant in Ghana

Basic engineering of a: reverse osmosis, ultrafiltration and re-mineralization plant with a 60,000 m^3- day capacity that will supply different towns near Accra

1st BUR Mauritius

National GHG inventory. Quality assurance. Emission factors adjustment. MRV schemes. Training and capacity building. Report to the UNFCCC.

Sant Louis University (Senegal)

Design of three new buildings and supervision of works.

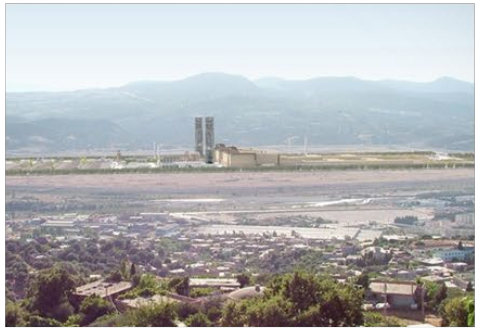
The project that have obtained different international awards.

Supply to the Sousse Region (Tunisia)

Water management plan for more than 400,000 inhabitants. Hydraulic modelling of the network, and Draft of the 1st phase of the process

United Nations Library in Addis Abeba

Complete reform project: Analysis of current state, conceptual and executive design. Supervision of construction works.



Bellara Steel Complex (Algeria)

PMC for the complete design and construction of a new plant that will produce 2 million tons/per year of construction steel

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More info: www.idom.com
Thank you!

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