

Madagascar



Strengthening regulatory framework and national capacity for monitoring effluent discharge, water and sediment quality in coastal marine areas of Madagascar

by

Centre National de Recherches sur l'Environnement (CNRE)

WIOSAP Project Steering Committee Meeting
Durban

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Centre National de Recherches sur l'Environnement (CNRE)

- Public institution created in 1987 under the administrative supervision of the Ministry of Higher Education and Research
- Main mission is to contribute to implementing national policy for the environment and sustainable development
- CNRE working in the areas related to environmental protection and management in general
- Made up of 4 departments: Aquatic and coastal Ecosystem (D1); Terrestrial Ecosystem (D2); Environment & Social Sciences (D3); Environment & Quality of life (D4)
- Capacity to work alone or with partners
- Led WIOLAB water/sediment quality component

Project Background and justification

- 55 % of the population living in the coastal areas
- Marine resources: main source of income (US\$ 1 400 000 /y)
- Inappropriate legal framework for managing LBSA affected marine and coastal environment
- LBSA ineffectively controlled and managed for lack of scientific support affecting rich biodiversity and sensitive areas (ex:deltas and estuaries)
- Lack of appropriate legal framework for emerging investment (oil and gas, mining), source of pollution for the coastal environment and water resources
- Capacity built up during WIOLAB to be valued to help set up appropriate and effective legal framework for LBSA management



Wastewater outlet discharging into sea

09/02/2007 10:27



Dump in a mangrove area



Solid waste in sewage



Solid waste dumped on the shore



Rubbish disposal on the beach



Industrial wastewater



Inadequate sanitation (migration leading to slum areas), with national access to improved sanitation of 6.9%;

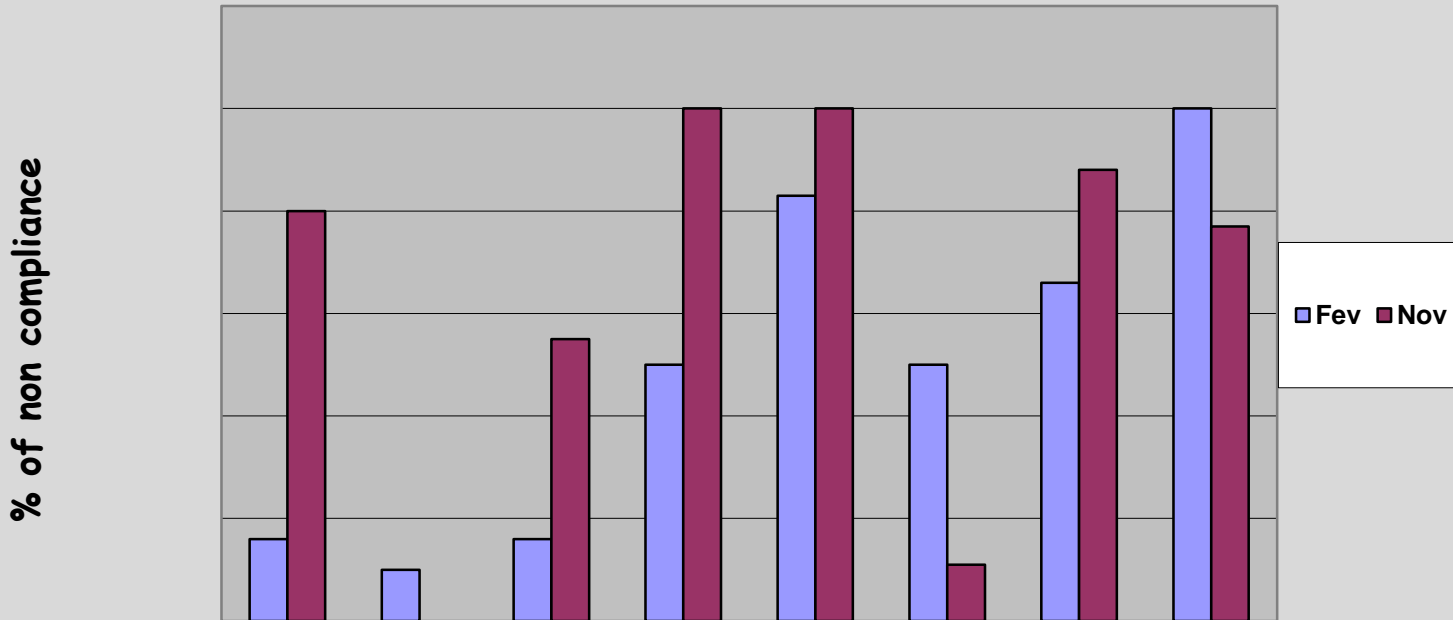


Telluric Pollution

Pointeur 15°44'56.12" S 46°29'02.35" E élév. 136 ft Mise au point 100% Altitude 37.89 mi

WIO LAB results: Conformity to WIO Environmental Quality Guidelines

Case of Mahajanga



Project Background and justification (continued)

- In short :
- challenging management of marine and coastal environment from LBSA pressure and impacts without supportive scientific capacity to guide in framing effective legislative and regulatory framework.
- Enhanced capacity and experiences at CNRE could provide that needed support through this demo project

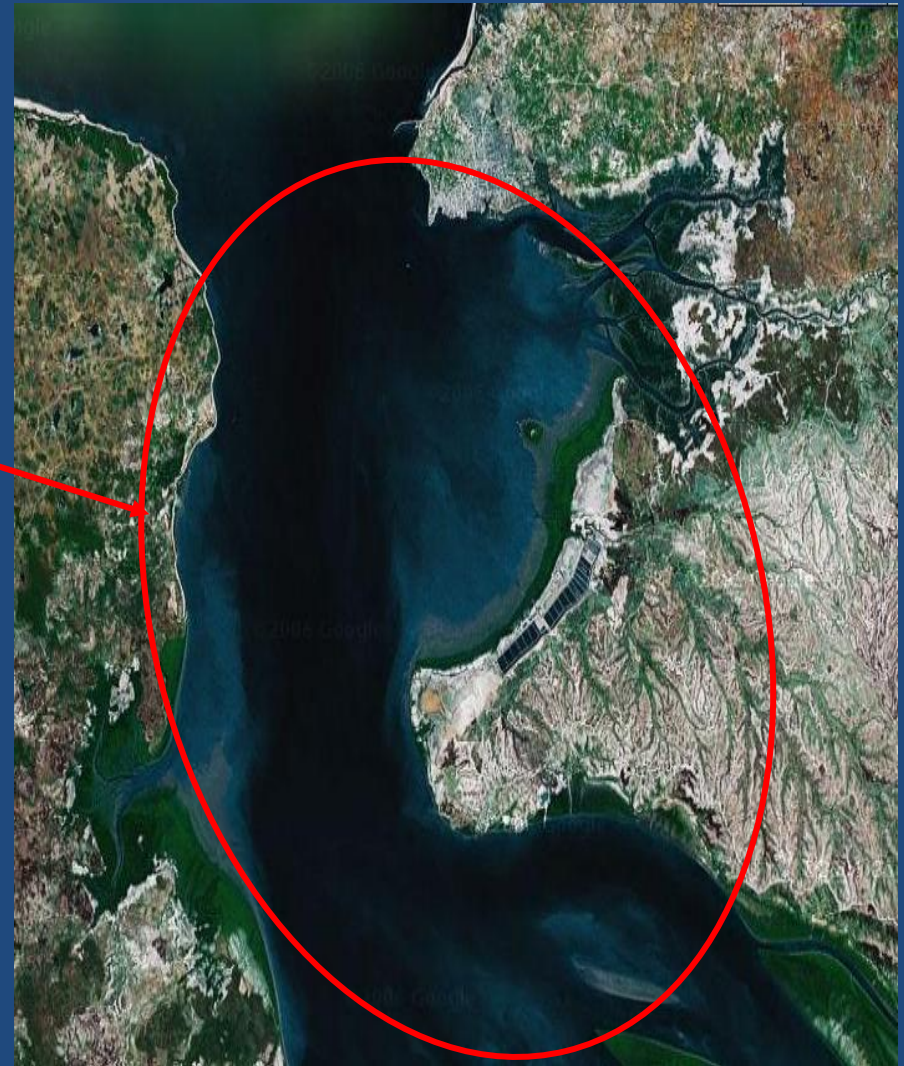
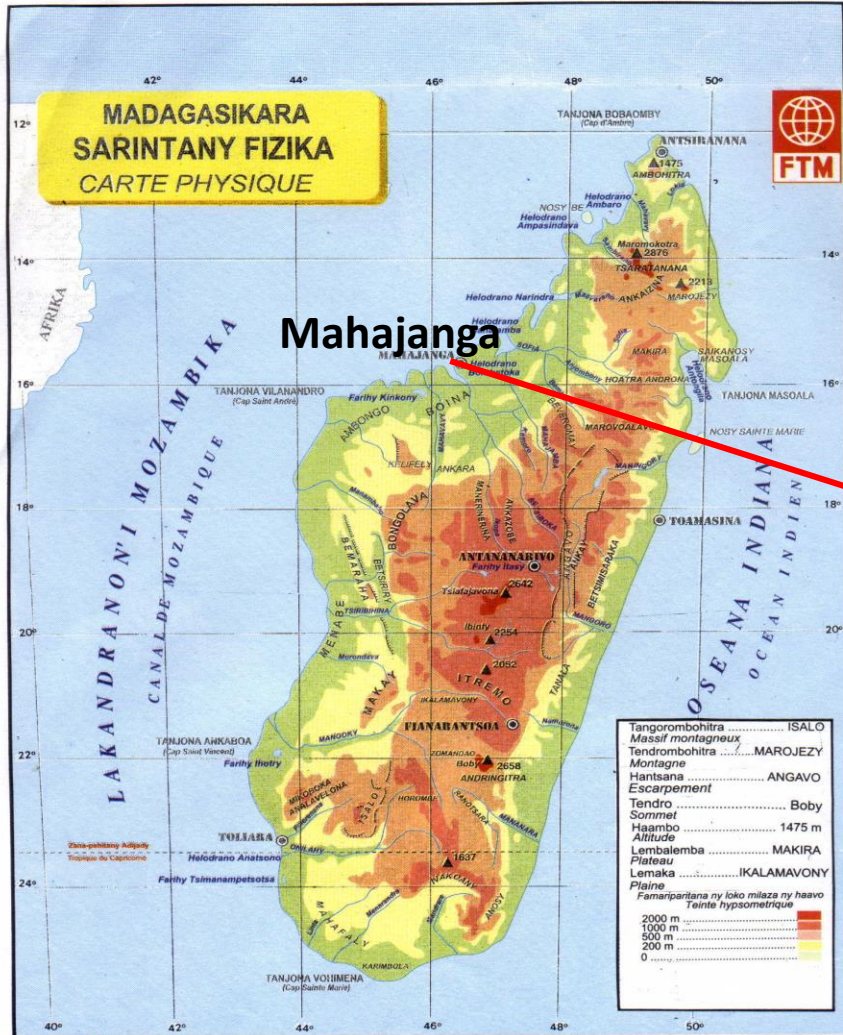
Among other LBSA consequences

- Sediment and biota contamination by heavy metals due to discharge of municipal waste and mine tailing;
- Beach unfit for recreational use due to bacteriological quality of water
- Suspected contamination of certain pelagic fish by cadmium that could impact on exportation
- Frequent case of food poisoning by fish consumption due to degradation of coral reef leading to extensive development of toxic algae
- Visible sign of eutrophication of certain bays

Project objectives

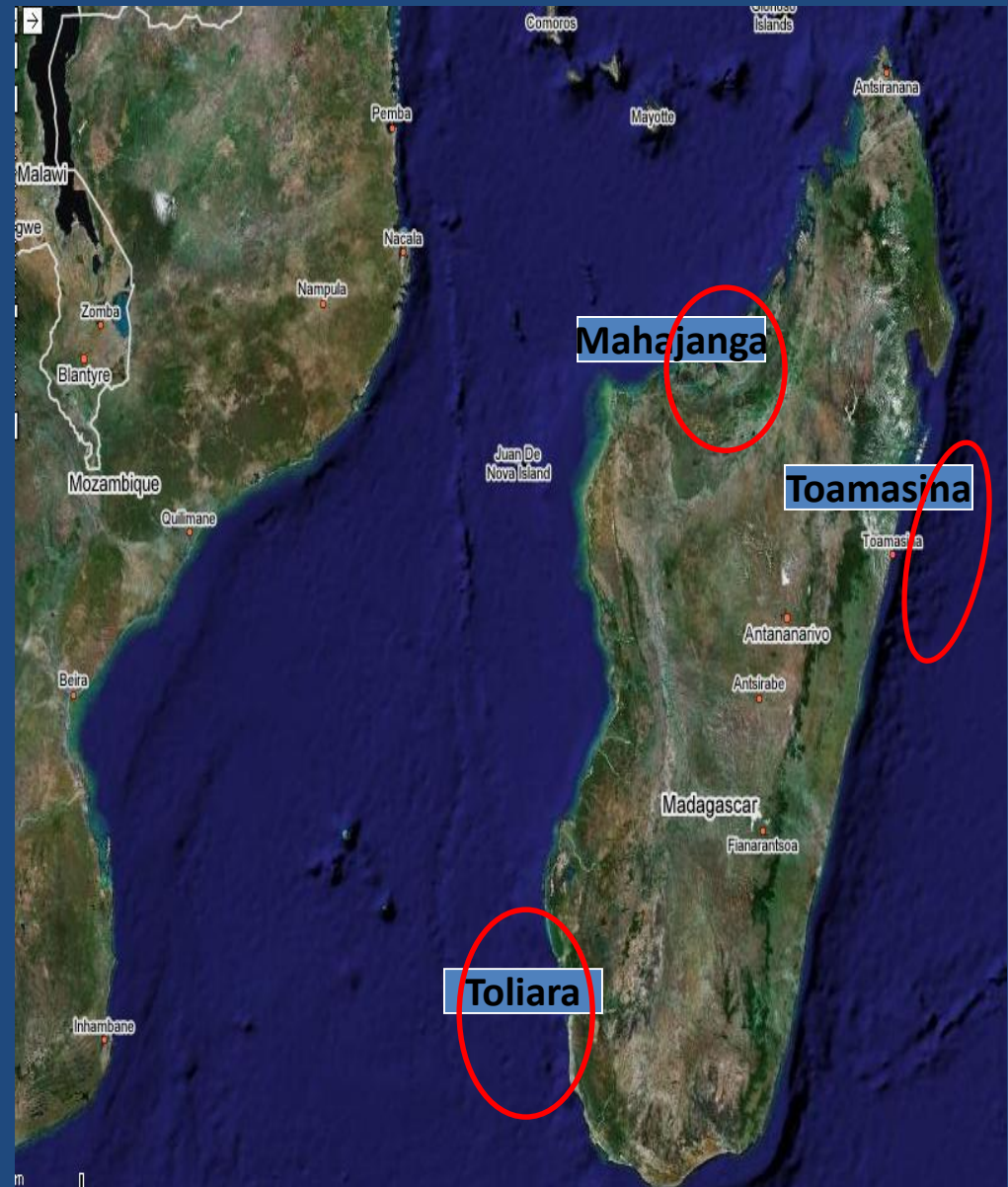
- **Main objective:** to improve the health status of LBSA affected marine and coastal ecosystems in the River Betsiboka estuary (including the Bombetoka Bay) through effective implementation and enforcement of an appropriate and regionally harmonized regulation framework.
- **Specific objectives:**
- **Objective 1.** Improve the MESD and its regional capacity to effectively manage and regulate land-based sources of pollution and activities
- **Objective 2.** Increase existing national monitoring capacity to help implement and monitor effluent discharges and water and sediment quality in receiving coastal and marine environment

The River Betsiboka estuary

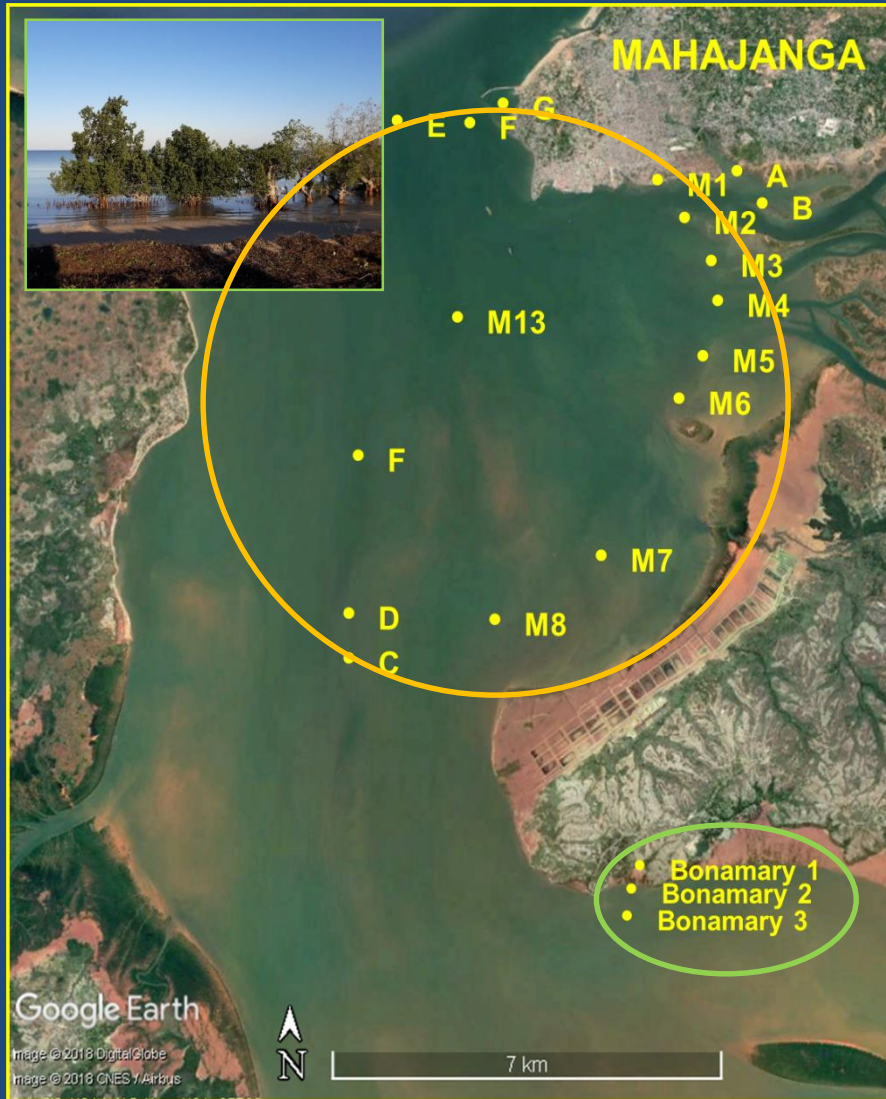


Monitoring LBSA impacts in 3 hotspots

- Monitoring activities as follow up of WIO-LaB project
- 2 hotspots in the west coast: Betsiboka river's estuary (Mahajanga), Great reef in Toliara
- 1 hotspot in the east coast: Toamasina



Monitoring areas



- Estuary
- Mangrove
- Bay
- Coral reef

Partners and their roles

- CNRE : lead institution, coordination and execution
- Ministry of Env & Sustainable development: execution (regulation framework) supervision, evaluation
- Regional direction of MESD in Mahajanga: beneficiary, tool user
- Other research institutions: working group for harmonized regulation and monitoring framework
- Foreign universities: capacity building in biological monitoring and decision making tool

Field sampling



Lab analyses

AAS analysis

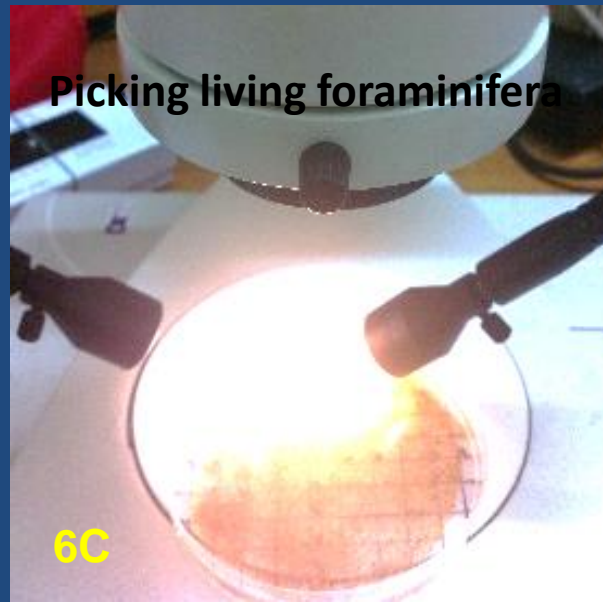


Sieving



6B

Picking living foraminifera



6C

Morphospecies identification



Linkages to ongoing initiatives

- ICZM – National Action Plan among other:
 - strategic axis 1: to improve and strengthen coastal and marine zones governance
 - strategic axis 3: to ensure protection and conservation of natural resources and coastal and marine ecosystems
- Manilla Protocole implementation
- GPA funded marine litter project
- Blue economy

Expected results

- Regionally harmonized and effective regulatory framework (effluent discharges, water/sediment quality)
- Decision support tool developed using indicators and indices
- Regional direction of MESD and other stakeholders management capacity improved and strengthened
- Regionally harmonized monitoring framework
- CNRE's monitoring capacity enhanced and strengthened

FSI

$9 \leq \text{FSI} \leq 10$ high

$5,5 \leq \text{FSI} \leq 9$ good

$2 \leq \text{FSI} \leq 5,5$ moderate

$1 \leq \text{FSI} \leq 2$ poor

azoic bad

Foram-AMBI

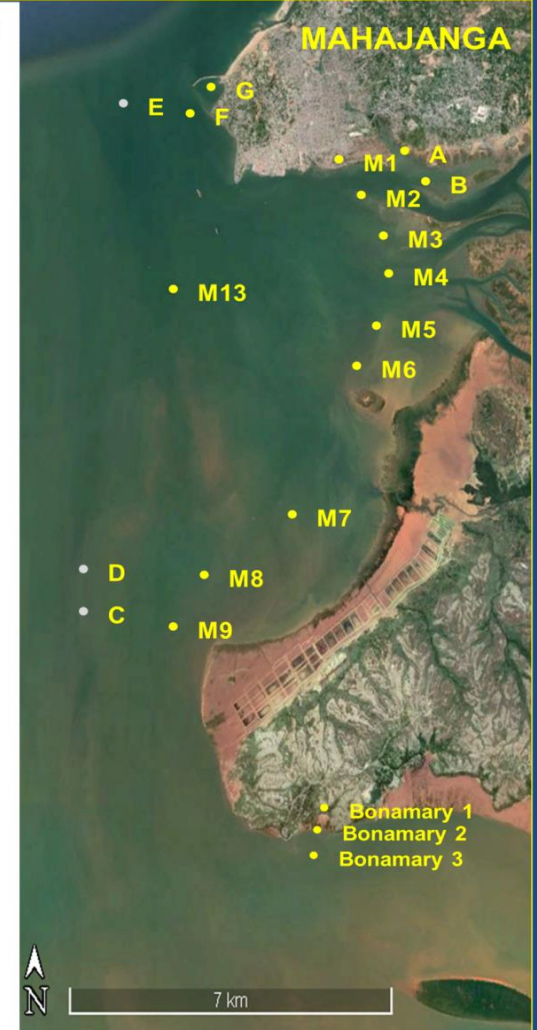
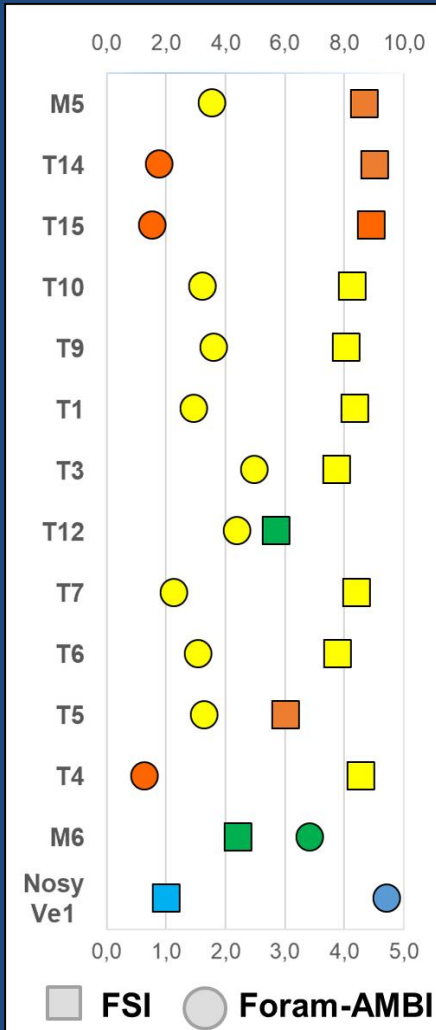
$\leq 1,2$ very good

$1,2 \leq x \leq 3,3$ good

$3,3 \leq x \leq 4,3$ moderate

$4,3 \leq x \leq 5,5$ poor

$5,5 \leq x \leq 6$ bad



Summary of the project working plan

- ***Specific objective 1:*** Improve the MESD and its regional capacity to effectively manage and regulate land-based sources of pollution and activities
 - ***Outcome 1.1:*** National regulatory framework and standards for effluent discharges and receiving water and sediment quality effectively implemented and enforced within the Betsiboka estuary catchment
 - ***Outcome 1.2:*** MESD regional direction in Boïna and concerned stakeholders for marine and coastal environment protection management capacity strengthened and improved
- ***Specific Objective 2:*** Increase existing national monitoring capacity in order to help implement and monitor effluent discharges and water and sediment quality in receiving coastal and marine environment
 - ***Outcome 2.1:*** National monitoring framework regionally harmonized, and fully implemented at the estuary's catchment level

Summary of the project budget

- **Output 1.1:** National regulatory framework for effluent discharge reframed and harmonized with the regional framework : US\$ 10 000
- **Output 2.1:** Decision support tool developed and adopted by MEEF representatives (at national level from the ministry and at regional level from the Boina region) : US\$ 20 000
- **Output 3.1:** National monitoring framework developed, validated and adopted by working group: US\$ 231 000
- **Co-financing:** US\$ 21 000
- **Administration:** US\$ 14 100
- **Total cost :** US\$ 296 100

In conclusion...

- **Good legal framework without strong monitoring capacity remain inefficient, and therefore useless**
- **The project could be one to materialise the Science to policy WIOSAP is committed to set up.**

Thank you