Side Event FAO
Atelier ICID

Decision making at the river basin level : OMVS

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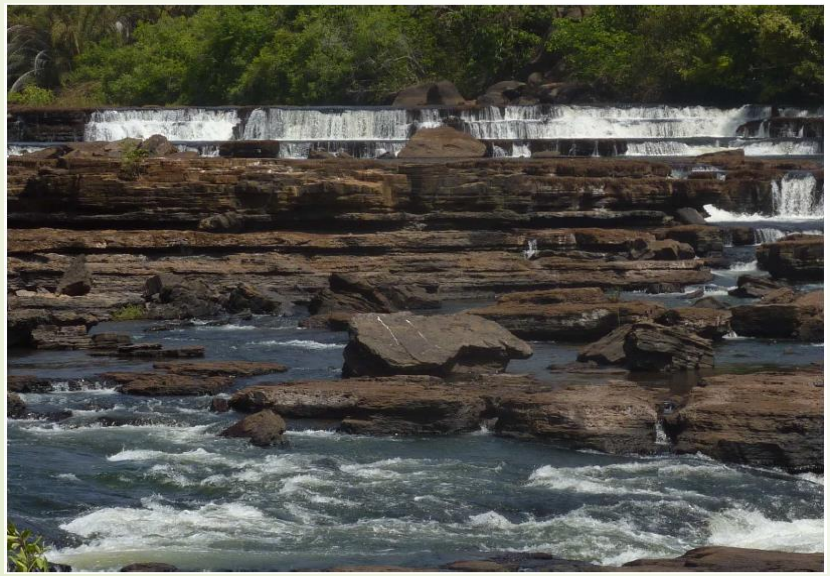


SUMMARY

1. OMVS : Presentation of River basin and OMVS
2. Main activities
3. Tools for decision / Models

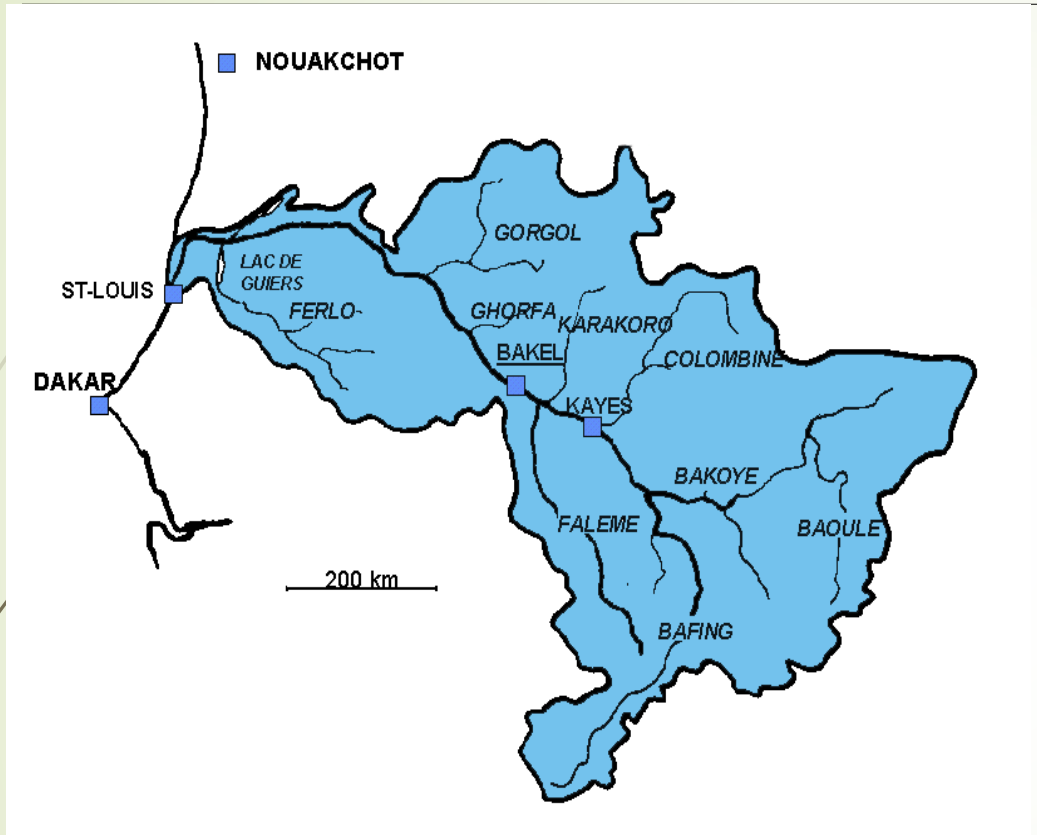
1

OMVS :Presentation of River basin and OMVS

River basin


Nouakchott
Aleg
Lac de Rkiz
Podor
Rosso
Sénégal
Bogué
O.Guélona
Gorgol Blanc
Mauritanie
Dagana
Richard-Toll
Doué
Kaédi
Gorgol Noir
Diama
Lac de Guiers
Gorgol
Foum-Gleïta
St-Louis
Sénégal
Mbout
Matam
O.Garfa
Maghama
Karakoro
Térékolé
Faria
Bakel
Le Sénégal
Dakar
Kayes
Kolimbiné
Mali
Bafoulabé
Bakoye
Baoulé
Gambie
Tambacounda
Falémé
Bafing
Bingassi
Manantali
Bamako
Guinée Bissau
Bakoye
République de Guinée

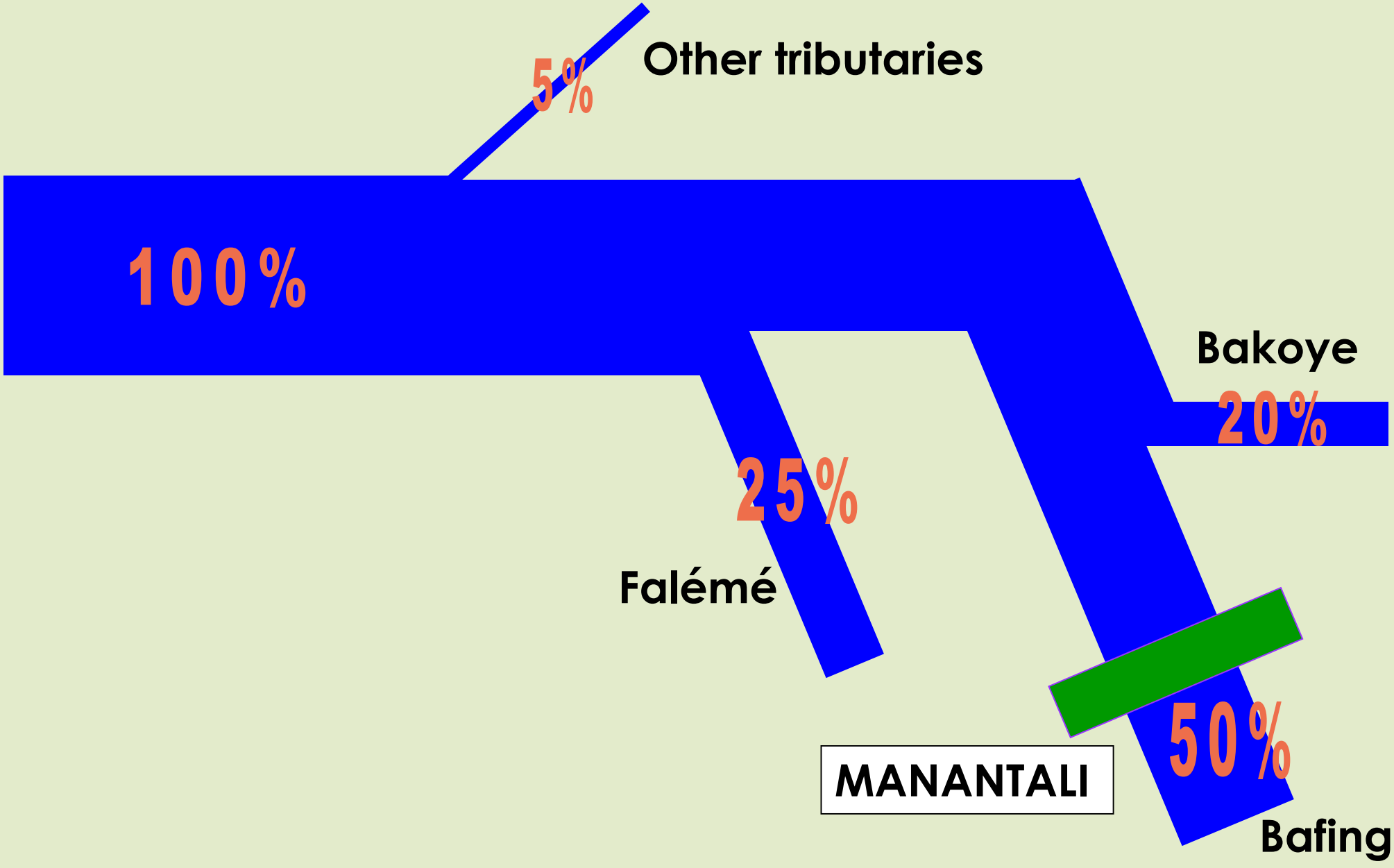
Main tributaries: the Bafing and Bakoye joining at Bafoulabé

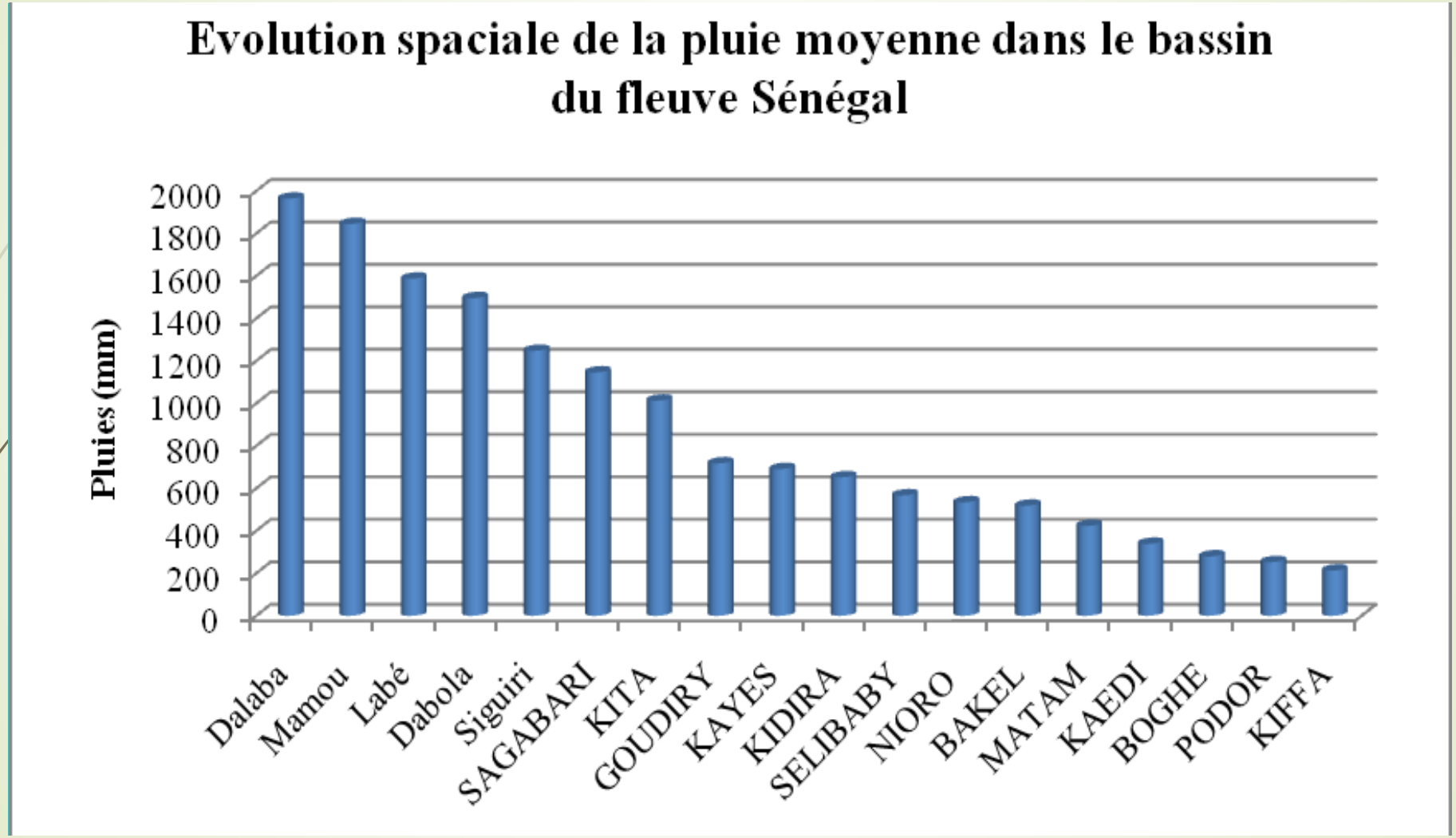


River length: 1800Km;
Surface area: 343 000 Km²;
Source: Fouta Djallon Mountains;
Extension: High Plateaux of Northern Guinea, Western part of Mali, southern regions of Mauritania and northern Sénégal.

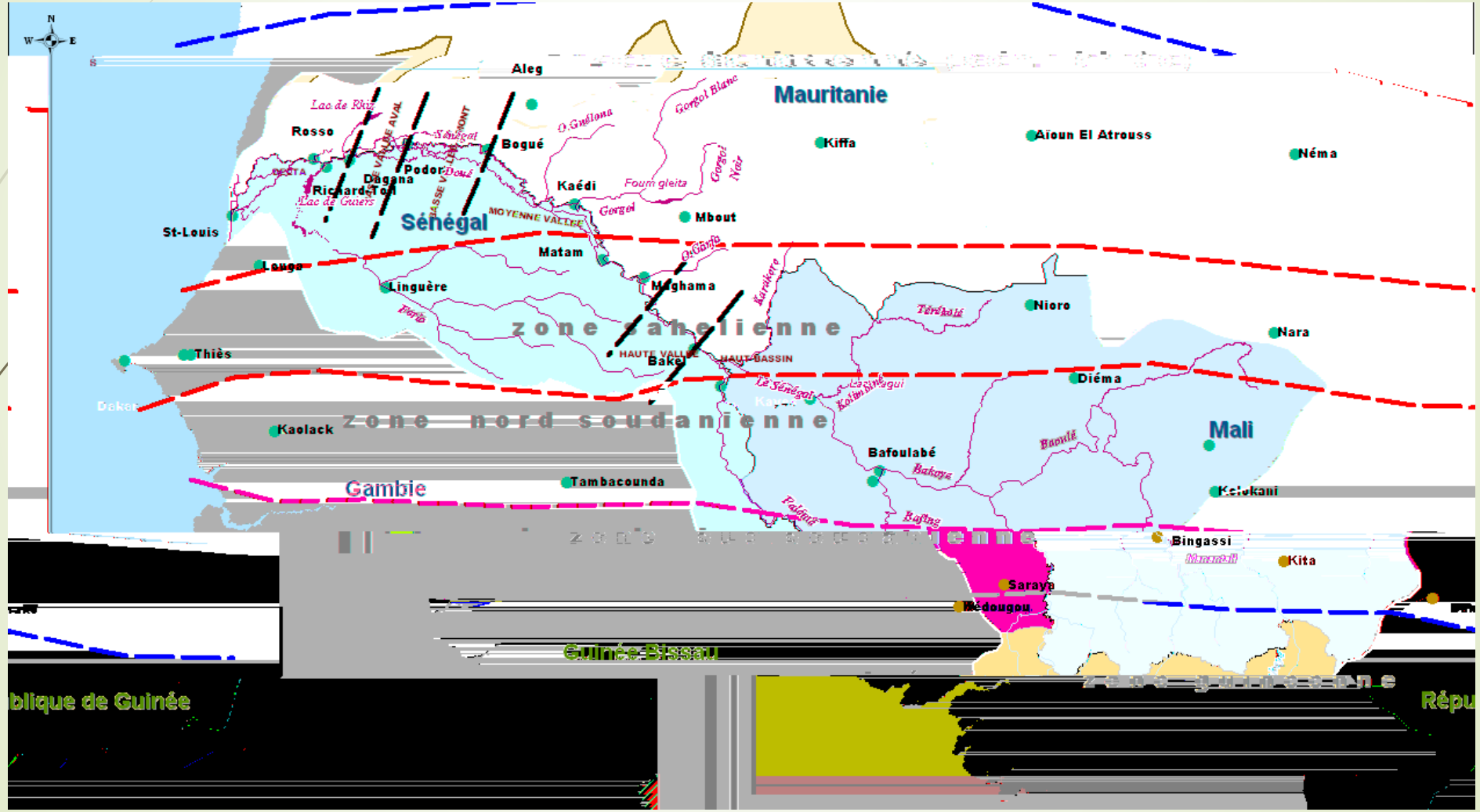
Other tributaries:
Faleme, Karakoro,Oued Ghorfa, Niordé, Gorgol

Senegal River- inflows distribution

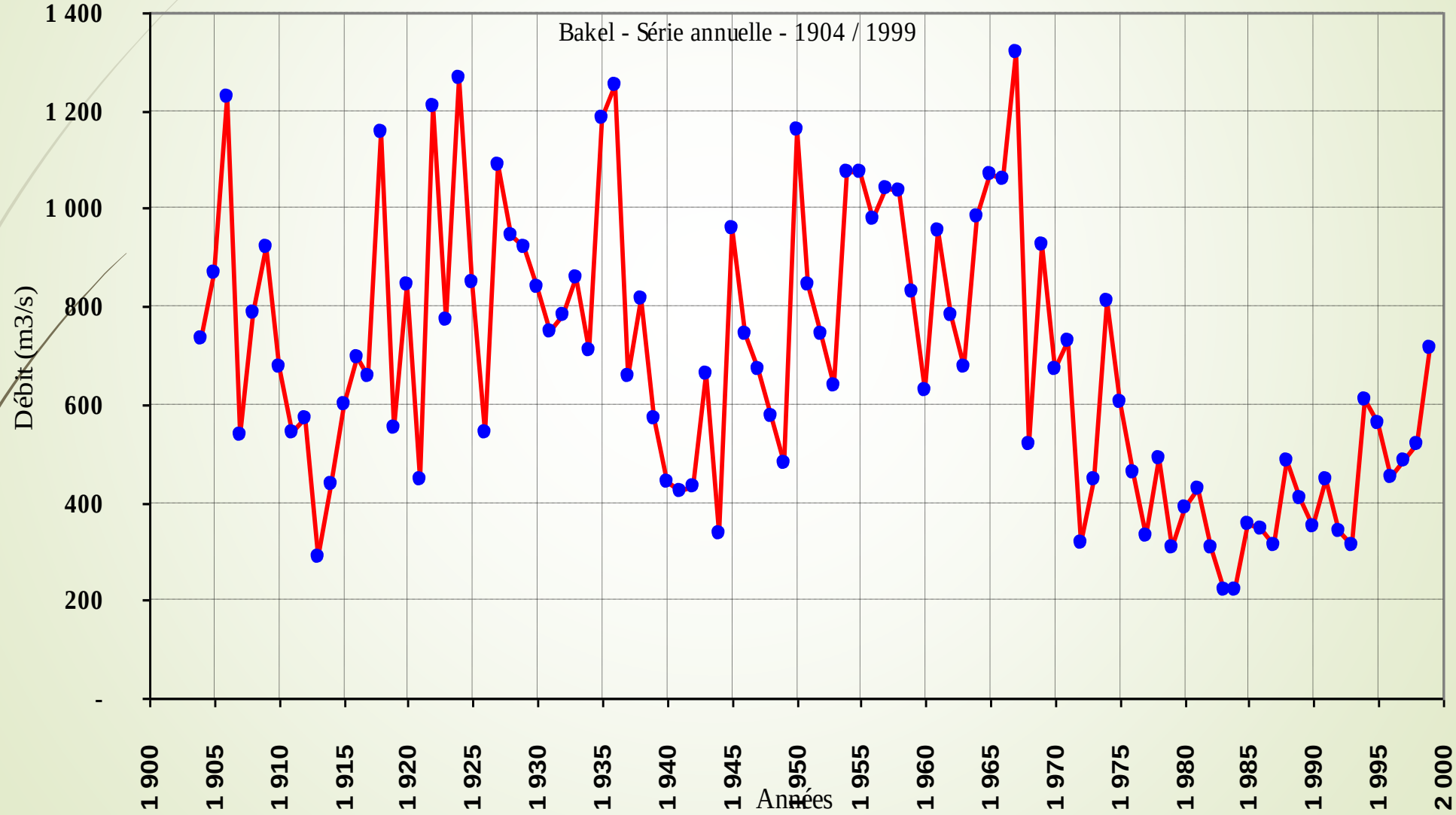



Evolution spaciale de la pluie moyenne dans le bassin du fleuve Sénégal
Pluies (mm)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Dalaba
Mamou
Labé
Dabola
Siguiri
SAGABARI
KITA
GOUDIRY
KAYES
KIDIRA
SELIBABY
NIORO
BAKEL
MATAM
KAEDI
BOGHE
PODOR
KIFFA

Climatic zones



Very variable resources



Attempts of cooperation (continued)

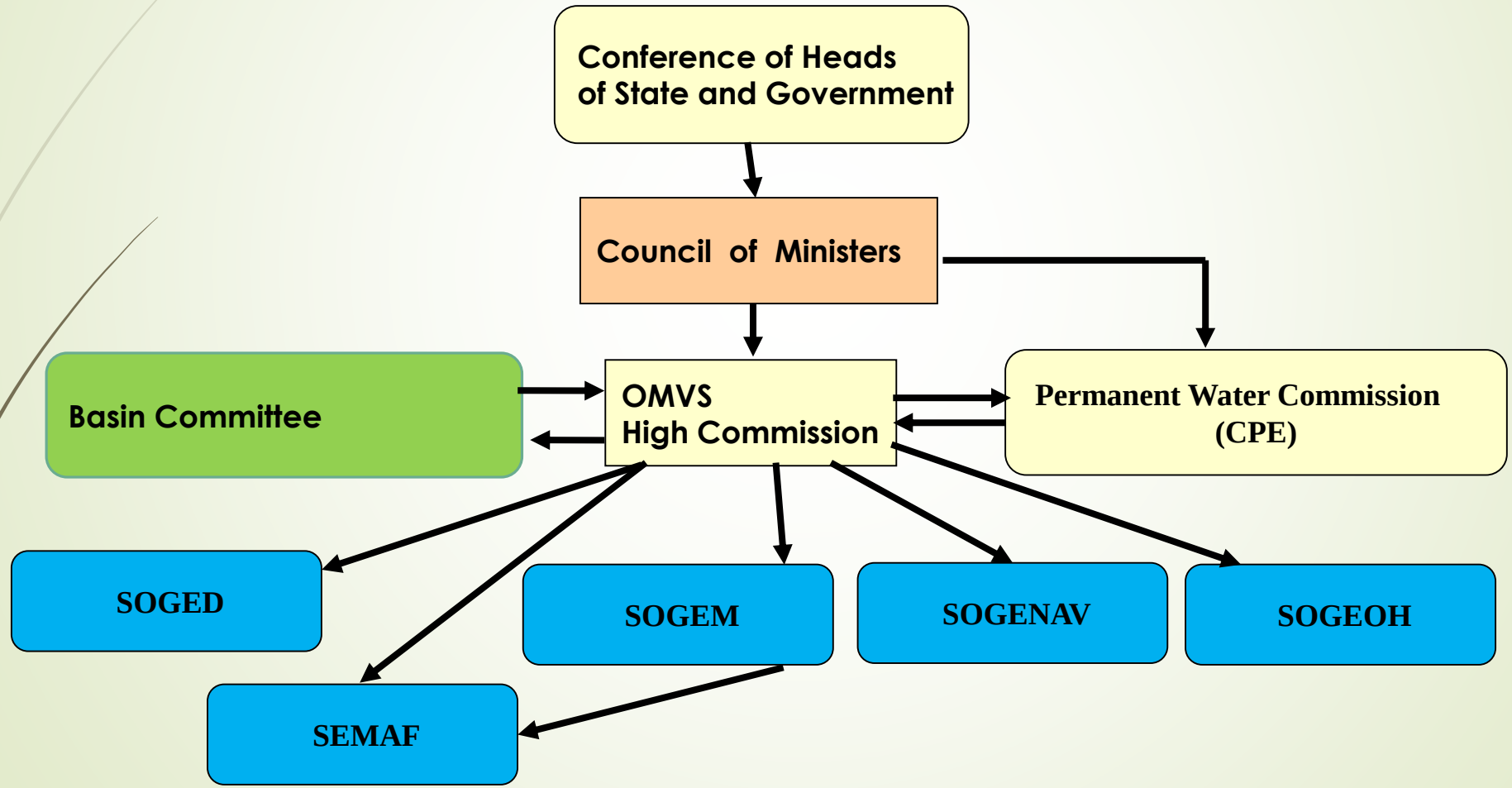
- Sectorial studies and development of the Lower Valley and the Delta by the MAS(Mission d'aménagement du Fleuve Sénégal)
- From 1959 to 1972 : establishment of a Joint Organization of the three states, the Inter-states Committee and the OERS – Organization of the Riparian States of the Senegal River
- Finally OMVS was born in 1972
  - The Senegal River Development Organization is a basin organization established in 1972 by Mali, Mauritania and Senegal
  - Guinea rejoined since March 17, 2006

OMVS : Senegal River Development Organization

Mission

- Ensure food security for all people within the river basin and the region;
- Increase incomes for the basin populations;
- Preserve ecosystems balance within the basin;
- Reduce economic vulnerability of OMVS Member-states to climate variability and external factors such as climate change;
- Scale up economic development within the Member-states.

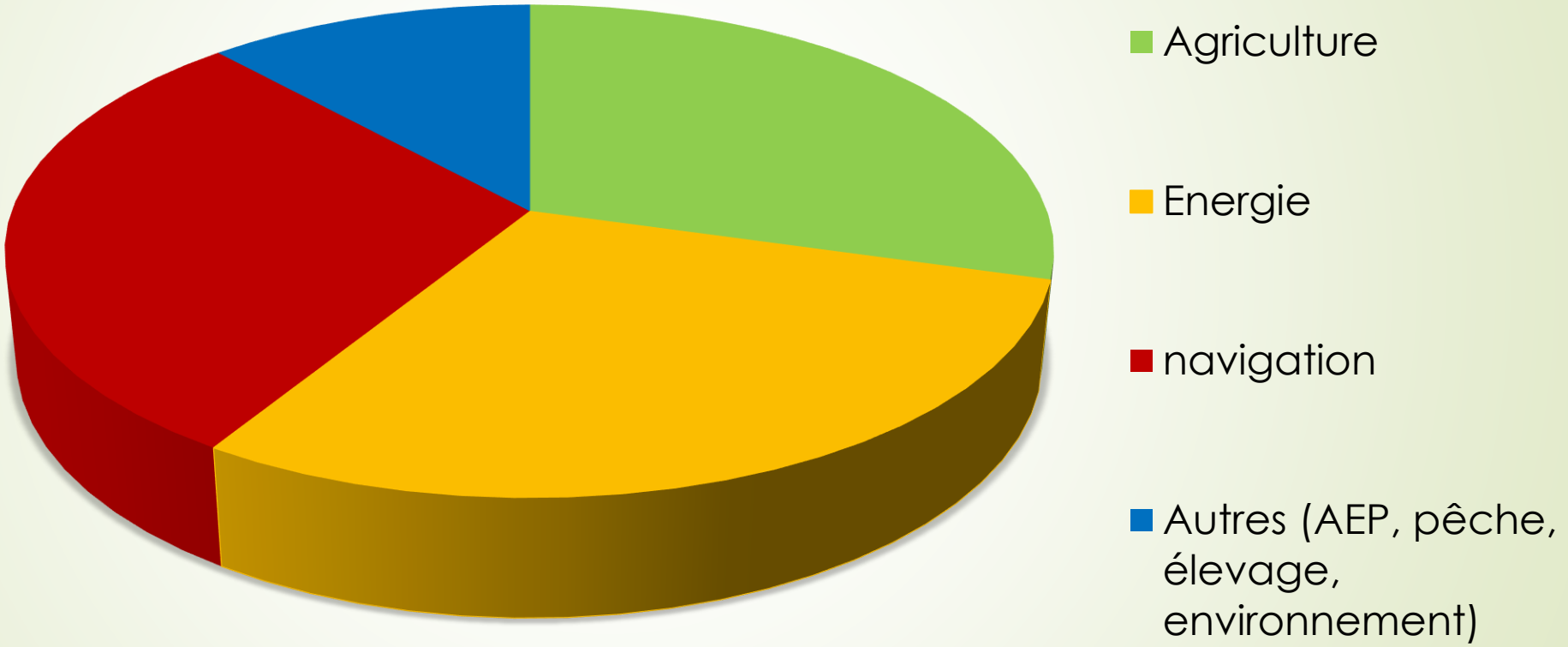
Institutional frame



2

Main activities

Water uses

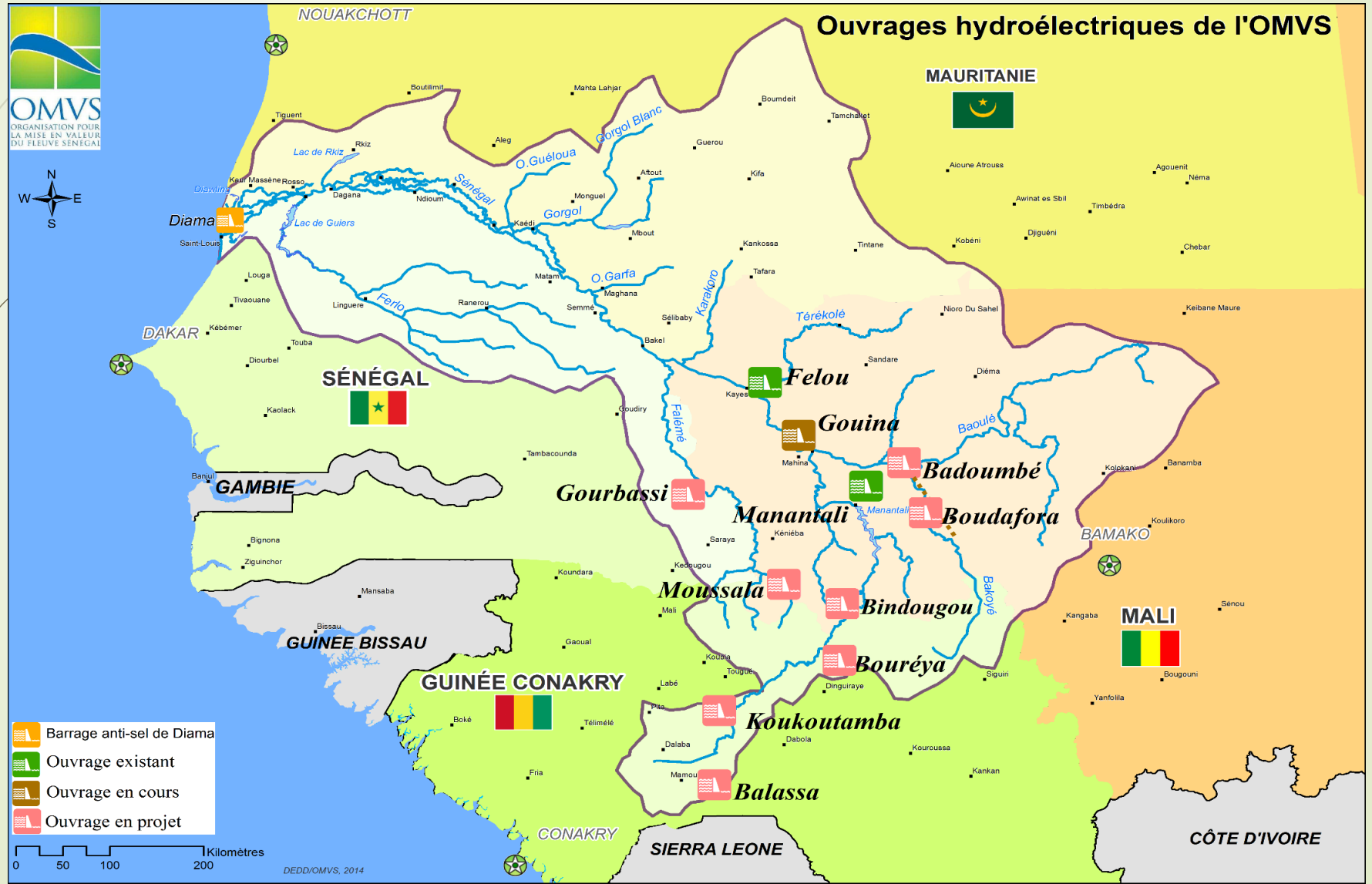

Agriculture
Energie
navigation
Autres (AEP, pêche, élevage, environnement)

Water uses

Irrigated agriculture;

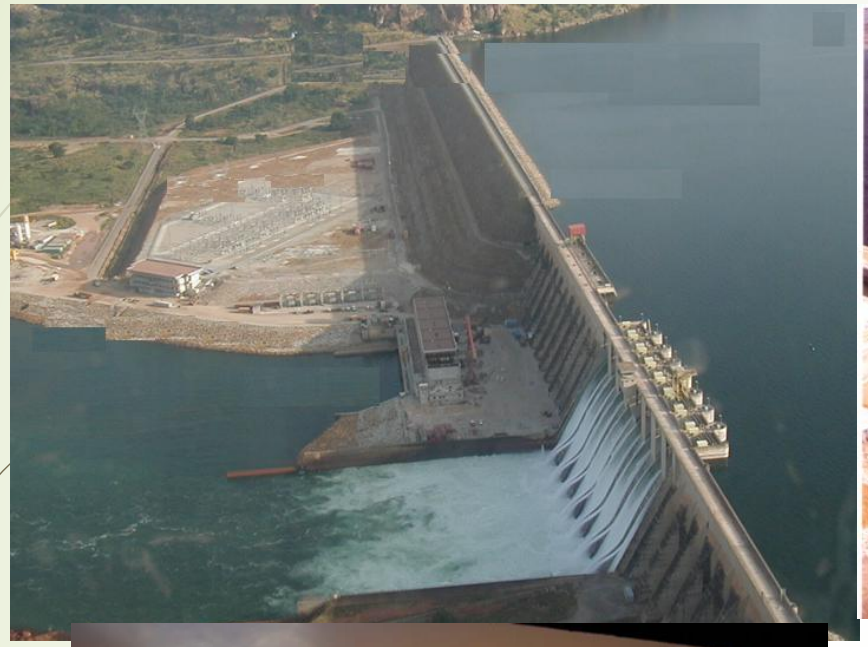
- Hydroelectric power production;
- Access to potable water and health;
- preservation of ecosystems;
- Perennial navigation on the river, under under the framework of a multimodal transport integrated system.

OMVS: Dams


Ouvrages hydroélectriques de l'OMVS
OMVS
ORGANISATION POUR LA MISE EN VALEUR DU FLEUVE SÉNÉGAL
NOUAKCHOTT
MAURITANIE
SÉNÉGAL
GAMBIE
GUINEE BISSAU
GUINÉE CONAKRY
MALI
SIERRA LEONE
CÔTE D'IVOIRE
DAKAR
BAMAKO
CONAKRY
Diama
Felou
Gouina
Badoumbé
Gourbassi
Manantali
Boudafora
Moussala
Bindougou
Bouréya
Koukoutamba
Balassa
Sénégal
Gorgol Blanc
O.Guéloua
Gorgol
O.Garfa
Karakoro
Térékolé
Ferlo
Falémé
Baoulé
Bakoye
Lac de Rkiz
Lac de Guiers
Barrage anti-sel de Diama
Ouvrage existant
Ouvrage en cours
Ouvrage en projet
Kilomètres
0 50 100 200
DEDD/OMVS, 2014

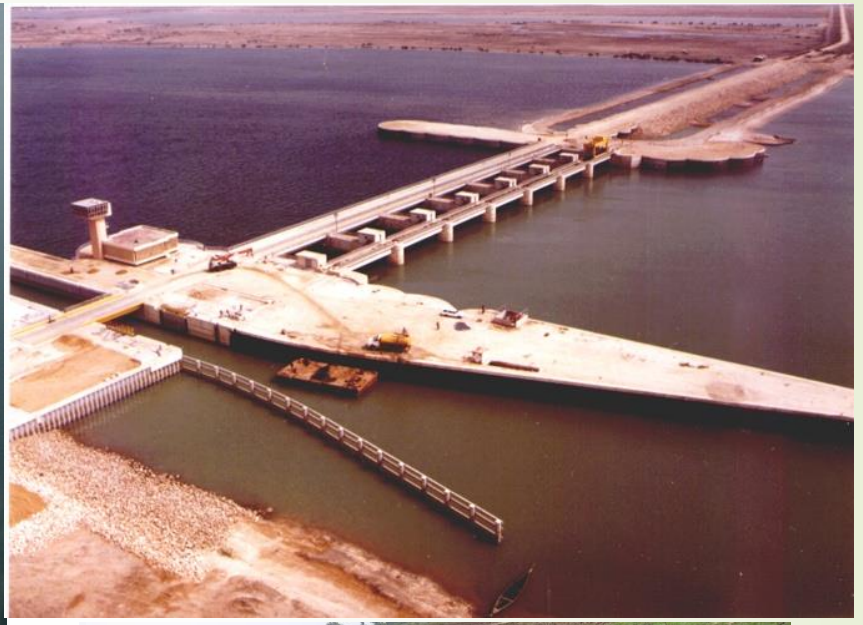
Manantali

Hydropower



Diama

Dam for irrigation



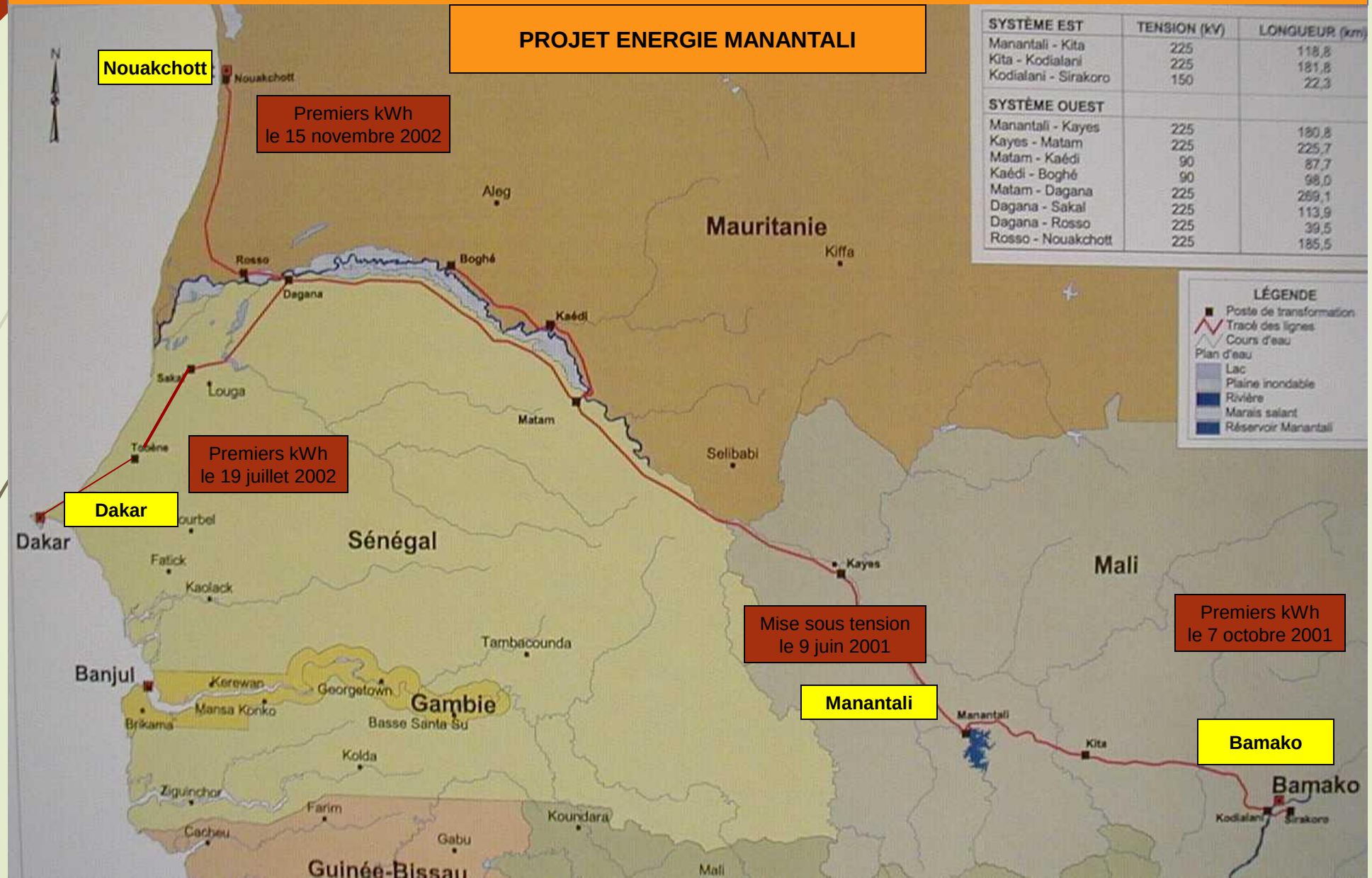
Manantali: reduce energy deficit - SOGEM

- Potential: 800GWh / year, guaranteed 9 years out of 10;
- A network of 1 500 km power transmission lines connecting the 3 riparian States;
- Cheap energy

Country	Cost (kw) of Manantali hydropower (in FCFA)	Cost (Kw) of thermal power (in FCFA)
Mali	30 FCFA	165 FCFA
Mauritania	31,5 FCFA	90 FCFA
Senegal	31,5 FCFA	60 FCFA

- Other benefits: River flow regulation for irrigation, artificial flooding, year-round navigability of the River

Le réseau 225kV est sous tension



Main uses

Irrigation

Navigation

Recession agriculture

Recession agriculture (sorgho)

Fish

Grass

Grazing

Environment

Groundwater recharge
Naural irrigation of forests
Provision of water for the national parcs
Preservation of plants
Habitat for animals

How to share and prioritize

3.

Tools for decision Models

LEGAL

- The Convention of 11 March 1972 on **the legal Status** of the River ;
- The Convention of 11 March 1972 relating to the **establishment** of the OMVS ;
- The Convention of 21 December 1978 on the **legal status of the Jointly Owned Structures ;**
- - The Convention of 12 May 1982 on the **financing modalities** of the **Jointly Owned Structures;**
- The Charter of the Senegal River Waters of 28 May 2002.
- **The International Code of** Navigation and Transport under ratification

Technical Tools

- Existence of a set of action and decision support tools : to give more weight to the force of the rule of law through sciences, techniques and technologies.
- **Permanent Water Commission renewed (CPE) :**
  - consultative body and decision support tool
- **Water Resources Dashboard(TBR) on Needs vs. Availability:**
  - _Assessment of water needs/ Availability of resources for various needs
- **Models :** Modèles , SIMULSEN, COREDIAM, Pluies/débit, Arpège avec MétéoFrance, Plan d'alerte
- **Master Plan for the development and management of the Senegal River Waters(SDAGE)**
  - Strategic and dynamic planning tool: long-term vision

Multicriteria analysis

- Economic analysis
- Costs – Benefits
- Multicriteria analysis

- Hydraulic simulations(100 scenarios)
- Economic analysis Costs – Benefits
- Multicriteria analysis

Multicriteria analysis

- Body of the cost-benefit study = cost - benefit analysis of different management and management scenarios
- Preceded by hydraulic balances of selected scenarios
- Complemented by a multi-criteria analysis on a limited number of scenarios, beyond a single C-B analysis
- Water balance resources-jobs of 100 scenarios built on the parameters e.g. hydro-agricultural development, navigation,
- Operating hydrograph of flood, distribution of crops
- Select and submit to an economic analysis the scenarios that best meet the balance sheets

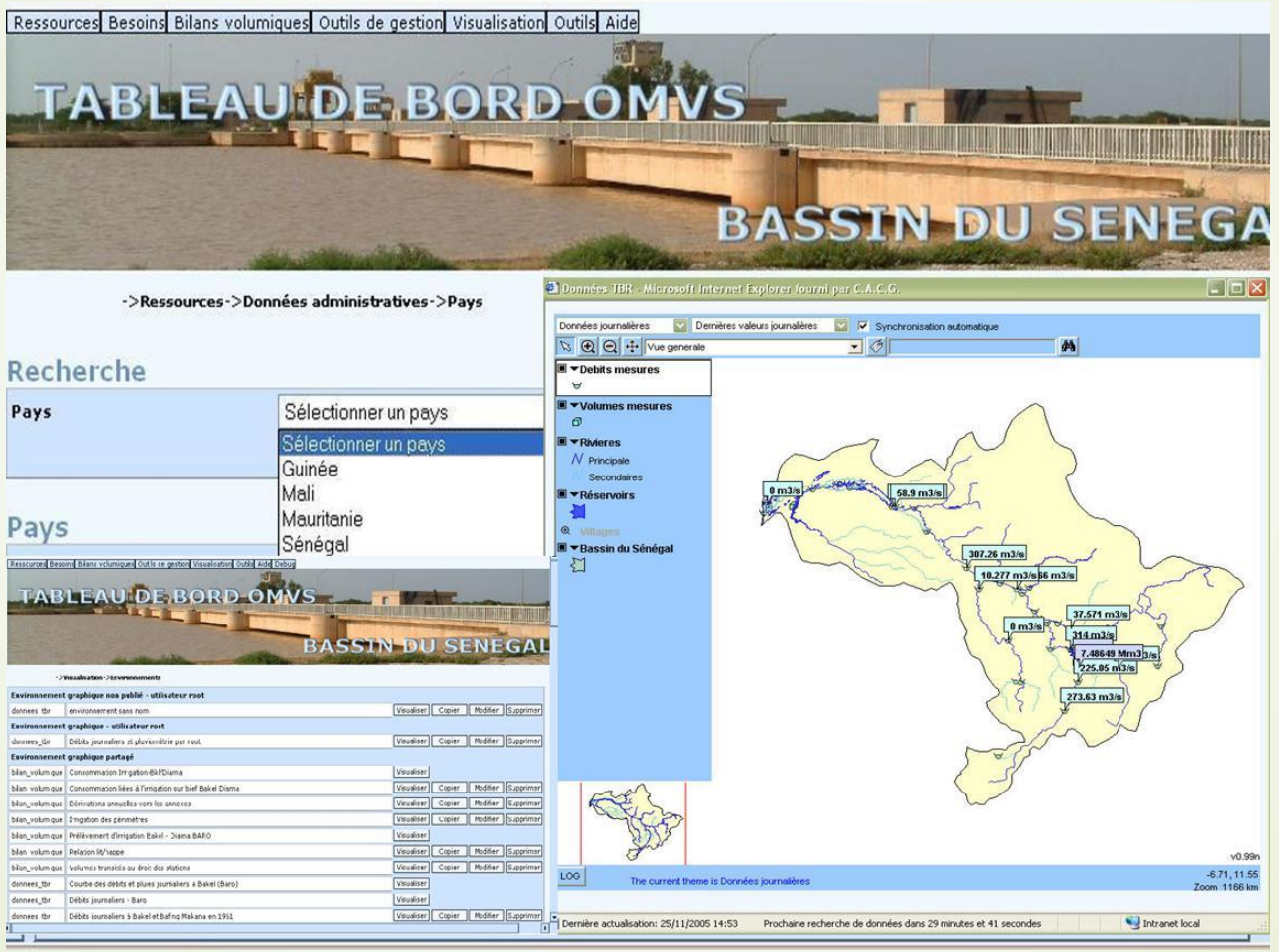
Activities

- **Cost-benefit analysis:**
  - Irrigation & livestock
  - Navigation
  - Energy
  - Recession activities: crops, fishing, forests
- **Multicriteria analysis:**
  - Previous activities
    - Health
    - Groundwater refill
    - Water quality
    - Flora and fauna …

Water Resources Dash Board

- Centralizes and structures information on water resources and their use in the basin;
- Assess inflows and withdrawals(water use for agriculture, AEP, industry, parks and reserves, etc.
- Offers decision support for possible trade-offs.

Water Resources Dash Board



SDAGE

Master Plan of Development and Management of Waters - SDAGE

- Objective : long term planning
- 2 levels:
  - Stage of studies
    - Diagnose the state or condition of the basin
    - Define sectoral orientations
    - Set the overall strategy for water management
  - Dissemination of studies
  - 3 detailed schemes for water development and management (SAGE) : Degradation of banks (Babaroto), Degradation of headwaters (Mamou, Tolo), Pollution (Delta)

Economic model of the SDAGE built on Rio Manager

- The cost-benefit analysis is based on an estimate of investment costs, maintenance costs and renewal of planned developments;
- It is possible to give the management scenarios an economic dimension, at the scale of the basin.
- The investment and maintenance costs of the projects must be compared with the economic benefits expected from their commissioning; in the case of the main scenarios studied, the expected gains relate to the increase of the hydro-electric production or the increase of the irrigated surfaces (thus of the agricultural production).

Economic model of the SDAGE built on Rio Manager

- The Cost-Benefit Analysis model is not an economic model for the profitability of structures.
- It is a model at the service of the SDAGE to compare development scenarios and to provide, in addition to the hydrological analysis given by the first model, results on the economic benefits of each scenario.
- It gives one more dimension to the decision-making between alternative scenarios.
- Both models are coupled

ERS

- The purpose of this Strategic Environmental Assessment (SEA) is to provide OMVS with a method and criteria for selecting the structure to be developed as a priority by this institution.
- The targeted works are Balassa (Guinea, on the Bafing), Boureya (Guinea, on the Bafing), Koukoutamba (Guinea, on the Bafing) and Gourbassi (Senegal-Mali, on the Falémé), defined, with their evacuation lines their access roads and environmental plans such as "Development Options"

Hydro-economic model and WEAP

- Collaboration with FAO – 2017-2018
- Hydro-economic model for the Senegal River basin built with FAO and University of Laval
- Simulation mode built on WEAP for operation of the basin
- Trainings to transfer knowledge to key practitioners at OMVS