

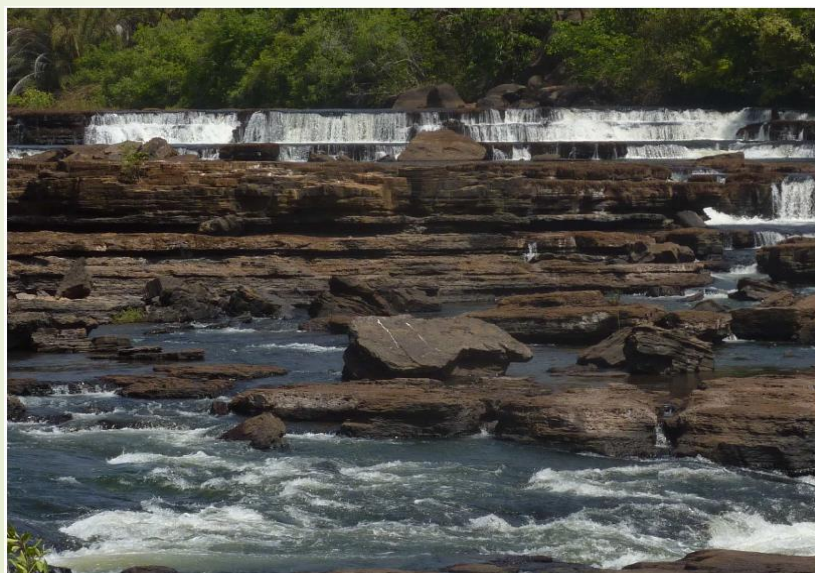


## Side Event FAO Atelier ICID

# 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**
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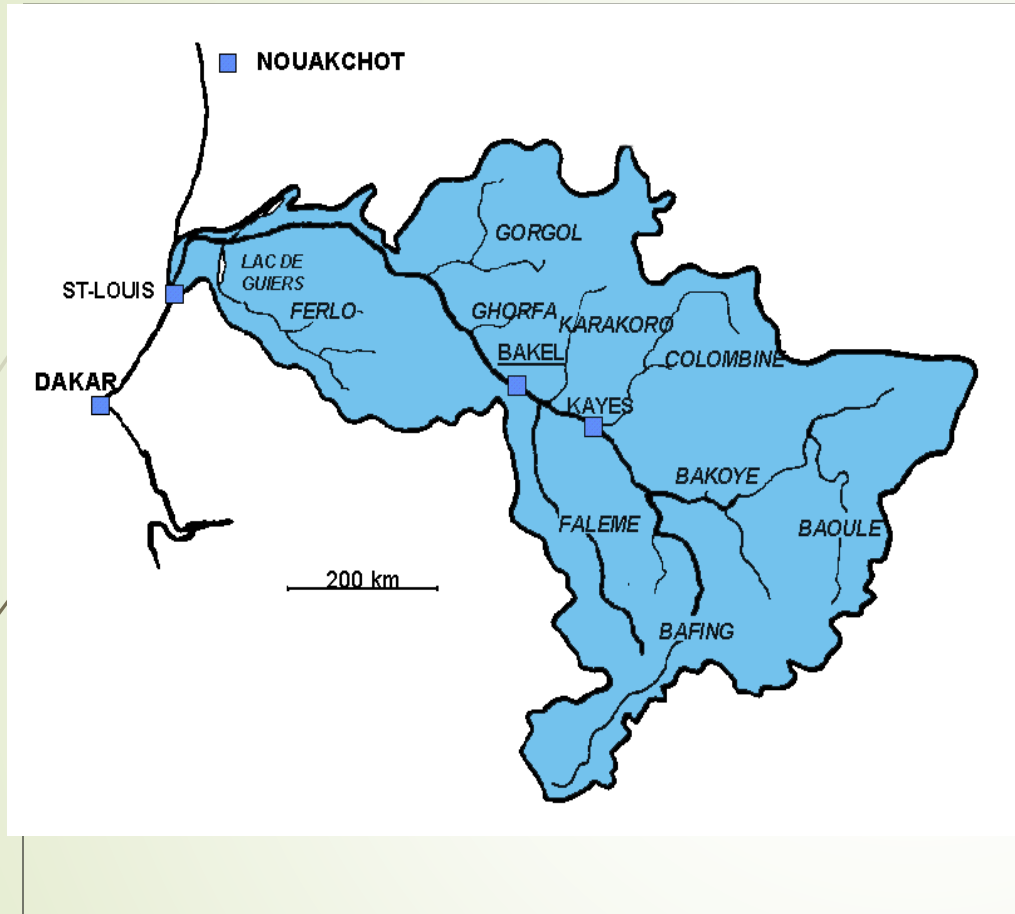
➔ **OMVS :Presentation  
of River basin and  
OMVS**



# River basin



## Main tributaries: the Bafing and Bakoye joining at Bafoulabé



**River length:** 1800Km;  
**Surface area:** 343 000 Km<sup>2</sup>;  
**Source:** Fouta Djallon

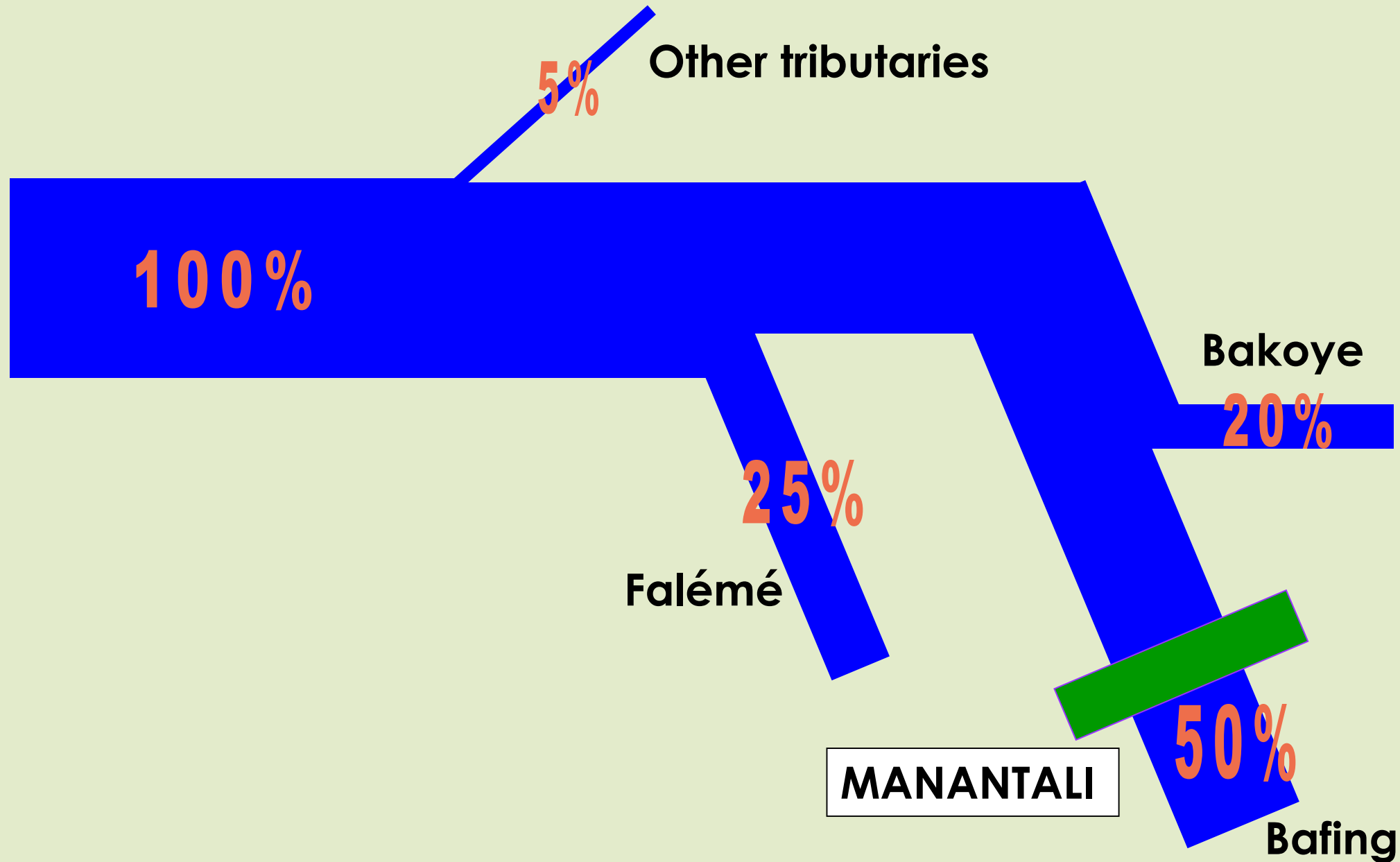
Mountains;

**Extension:** High Plateaux of Northern Guinea, Western part of Mali, southern regions of Mauritania and northern Sénégal.

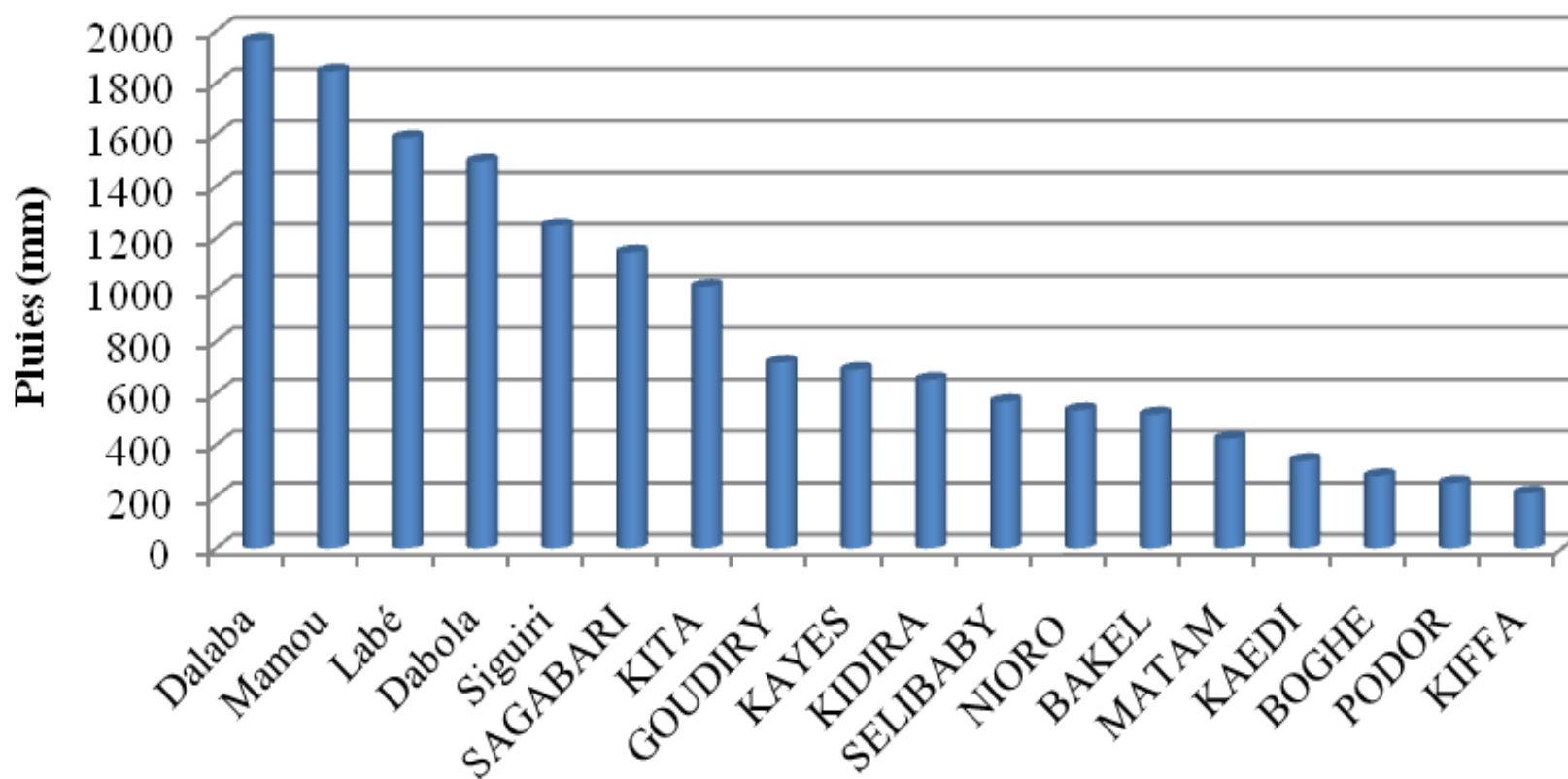
**Other tributaries:**

**Faleme, Karakoro, Oued Ghorfa, Niordé, Gorgol**

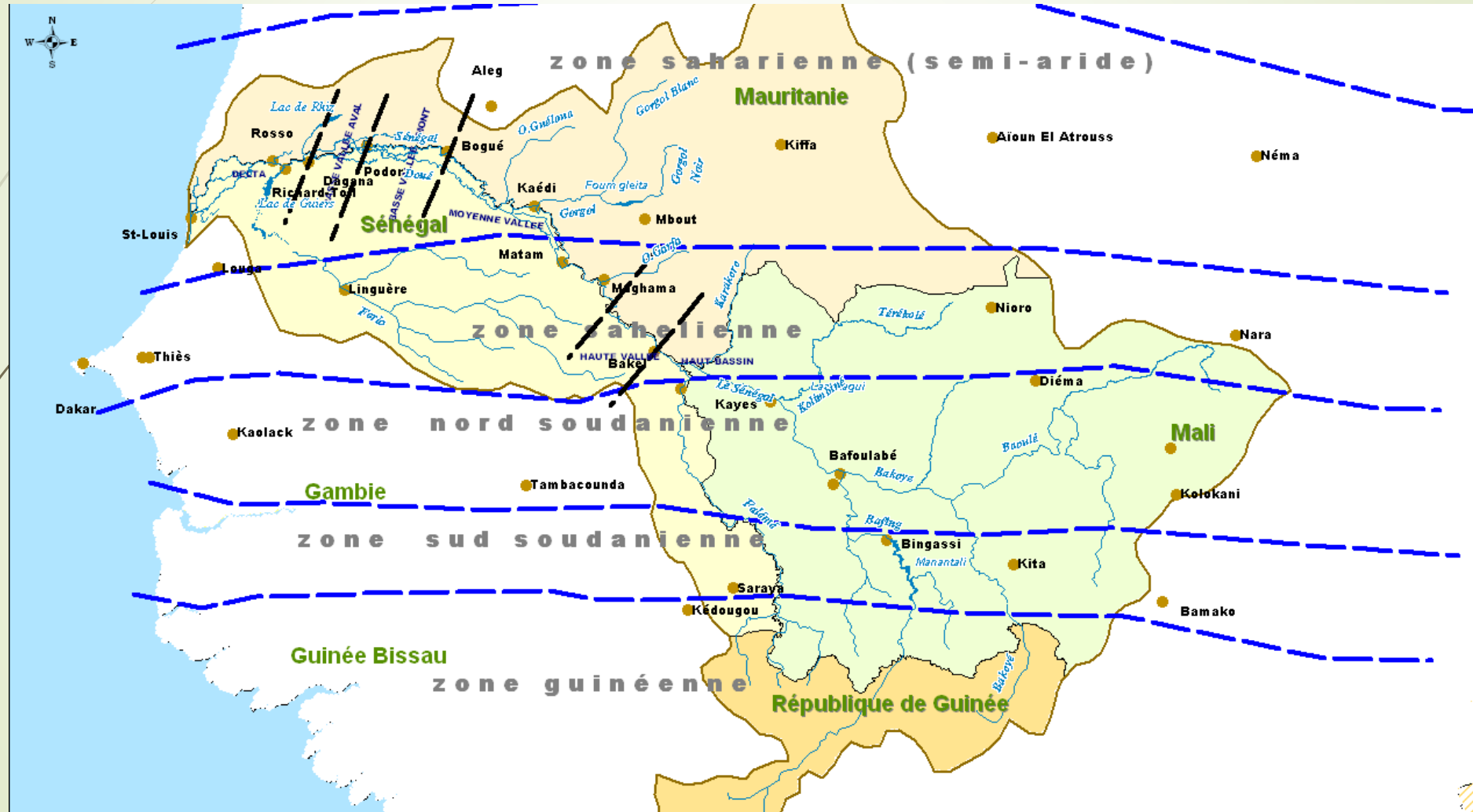
# Senegal River- inflows distribution



## Evolution spatiale de la pluie moyenne dans le bassin du fleuve Sénégal

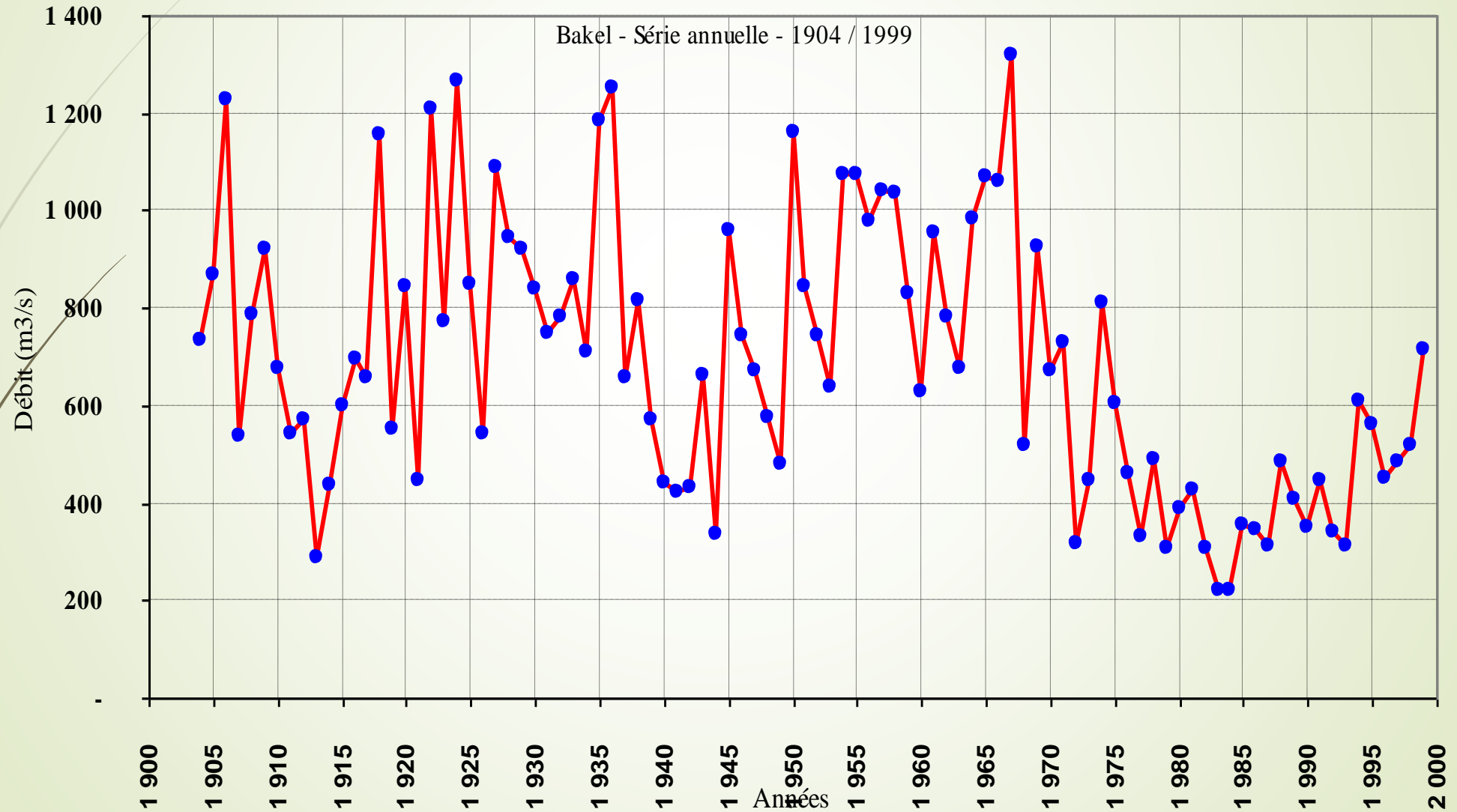


# Climatic zones





# Very variable resources



# Attempts of cooperation (continued)

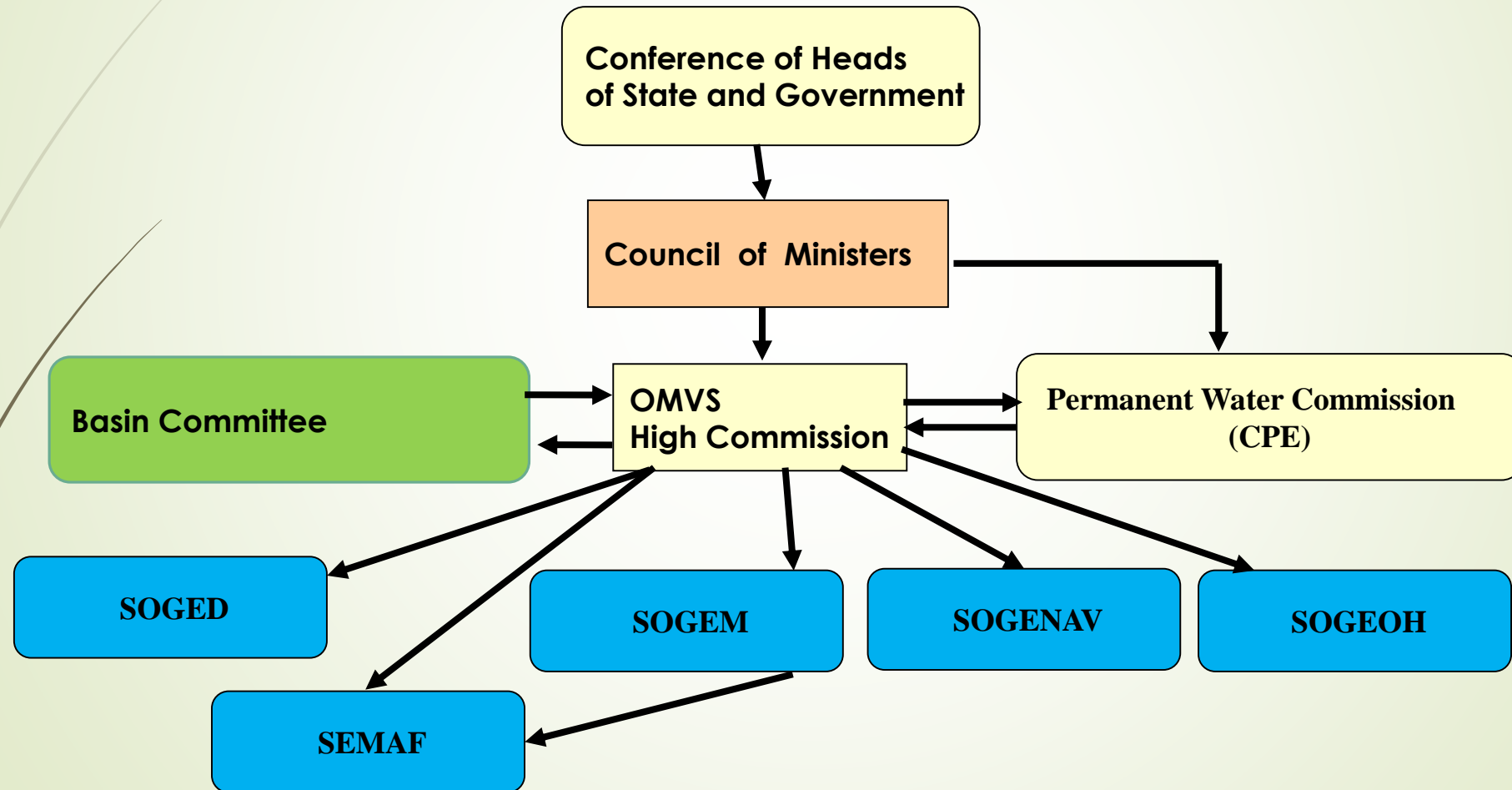
- Sectorial studies and development of the Lower Valley and the Delta by the MAS (Mission d'aménagement du Fleuve Sénégal)
- From 1959 to 1972 : establishment of a Joint Organization of the three states, the Inter-states Committee and the OERS – Organization of the Riparian States of the Senegal River
- 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

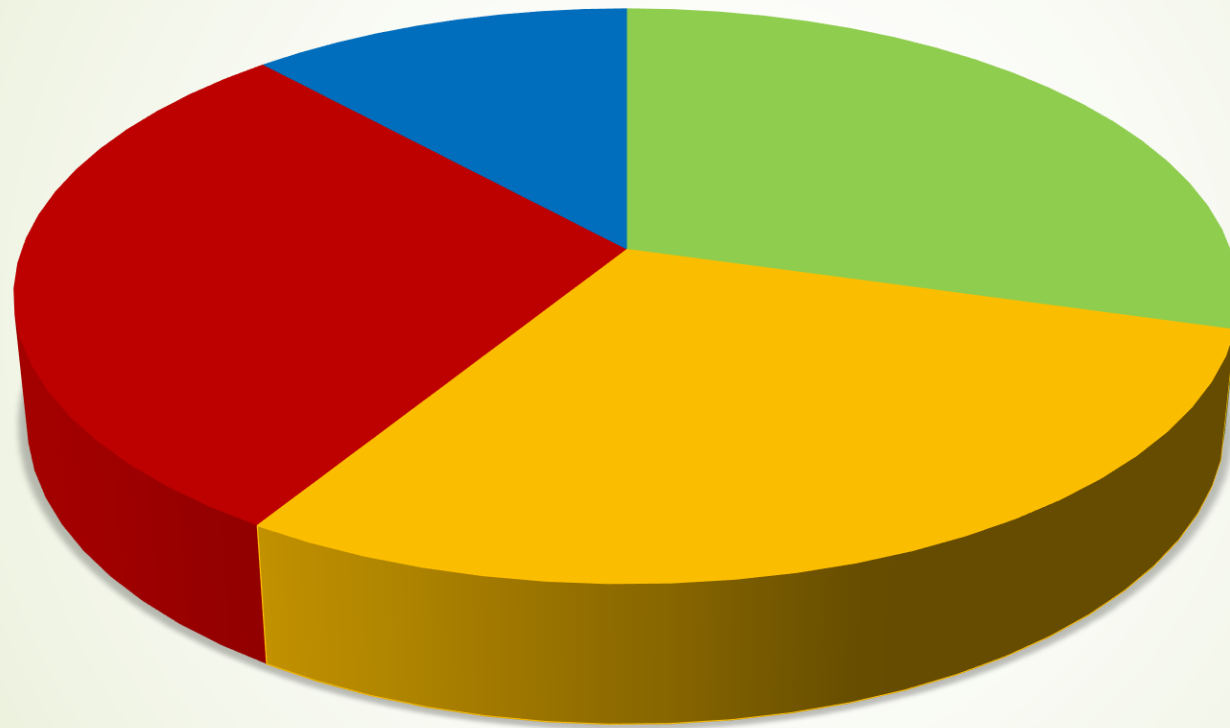




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# Main activities

# Water uses



■ Agriculture

■ Energie

■ navigation

■ Autres (AEP, pêche, élevage, environnement)

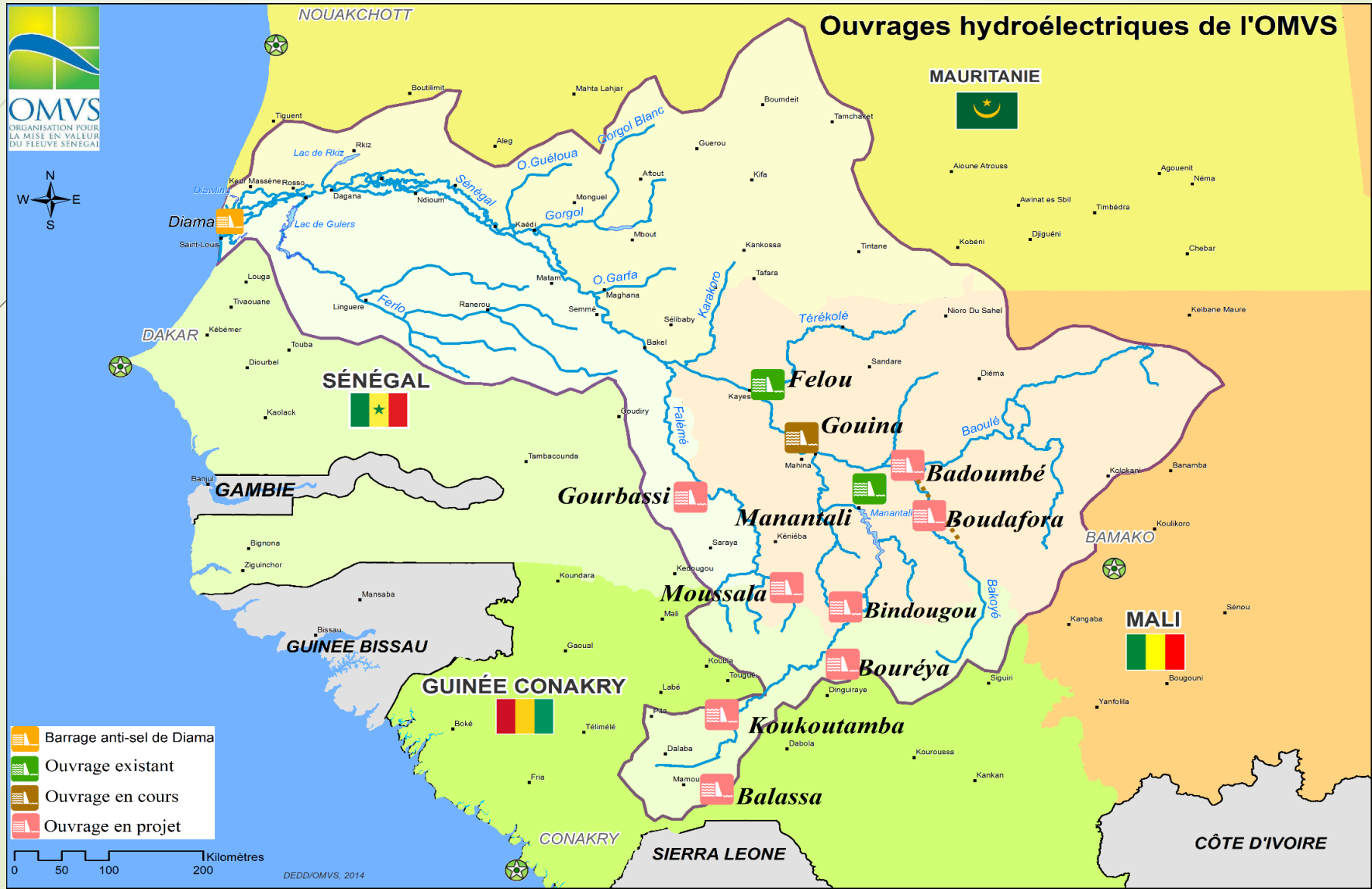


# Water uses

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





**Manantali  
Hydropower**



**Dama  
Dam for irrigation**



# Manantali: reduce energy deficit - SOGEM

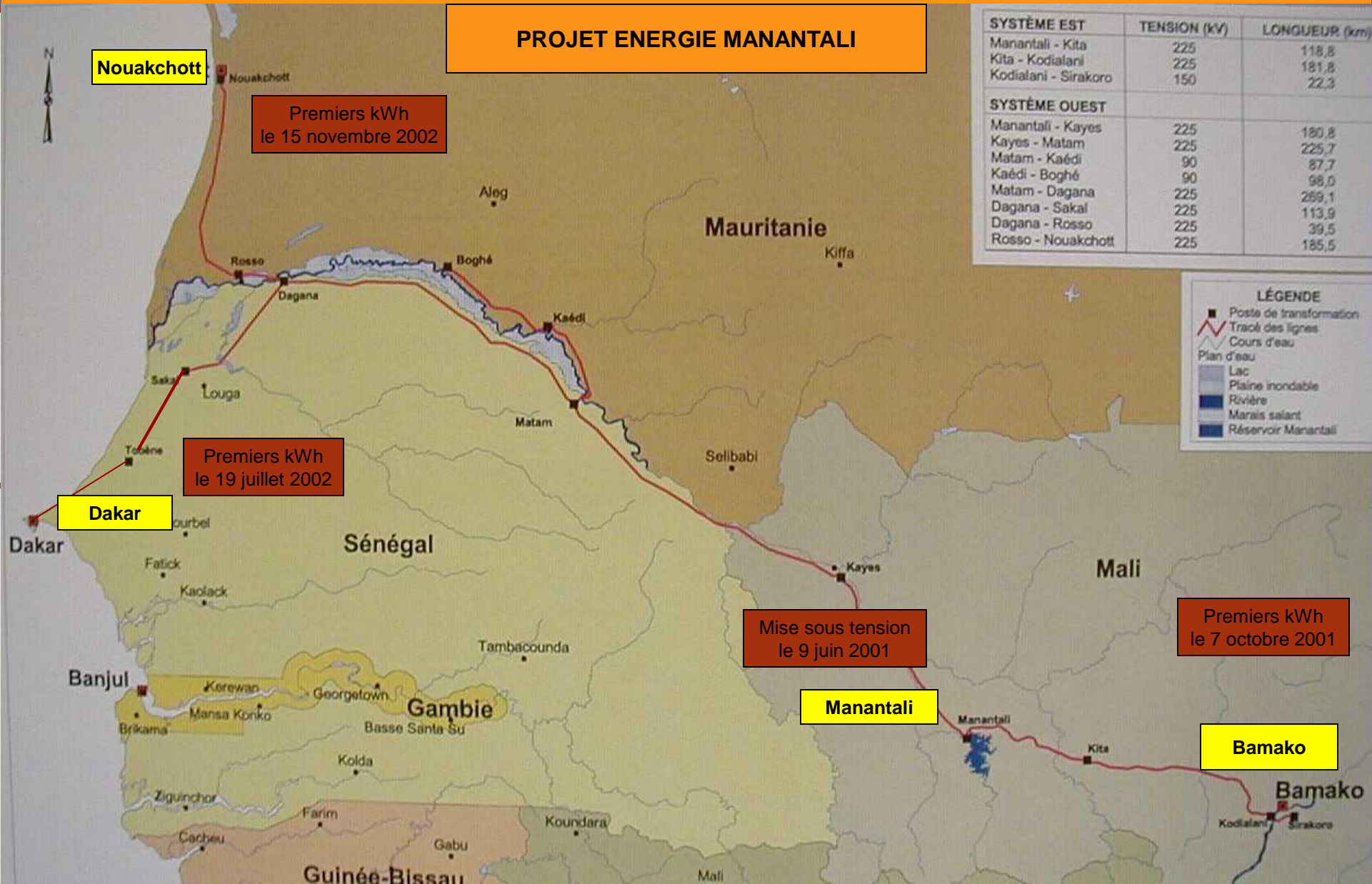
- Potential: 800GWh / year, guaranteed 9 years out of 10;
- A network of 1 500 km power transmission lines connecting the 3 riparian States;
- Cheap energy

| 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 (sorgho)

Recession  
agriculture



Fish



Grass

# Grazing





Groundwater recharge  
Natural irrigation of forests  
Provision of water for the national parks  
Preservation of plants  
Habitat for animals






# How to share and prioritize






3.



**Tools for decision  
Models**



- 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

The dashboard interface includes a navigation menu at the top: Ressources, Besoins, Bilans volumiques, Outils de gestion, Visualisation, Outils, Aide. The main header features a banner image of a dam with the text "TABLEAU DE BORD OMVS" and "BASSIN DU SENEGAL".

Below the banner, there is a breadcrumb trail: ->Ressources->Données administratives->Pays. A search section titled "Recherche" allows filtering by "Pays" (Guinée, Mali, Mauritanie, Sénégal) and "Pays" (Sélectionner un pays).

The central part of the dashboard displays a map of the Senegal basin with various data points indicating flow rates (e.g., 0 m3/s, 58.9 m3/s, 307.26 m3/s, 10.277 m3/s, 37.574 m3/s, 314 m3/s, 7.48649 Mm3/s, 225.85 m3/s, 273.63 m3/s). A sidebar on the right lists categories: Débits mesures, Volumes mesures, Rivières (Principale, Secondaires), Réservoirs, Villages, and Bassin du Sénégal.

At the bottom, there is a table of environmental indicators with columns for "données\_br" and "données\_tr", and buttons for "Visualiser", "Copier", "Modifier", and "Supprimer".



Enjeux application GIRE dans les bassins transfrontaliers : cas de l'OMVS

Dr Amadou Lamine Ndiaye Expert à l'OMVS

# 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