REPÚBLICA DE MOÇAMBIQUE

Workshop on IWRM – Eflows

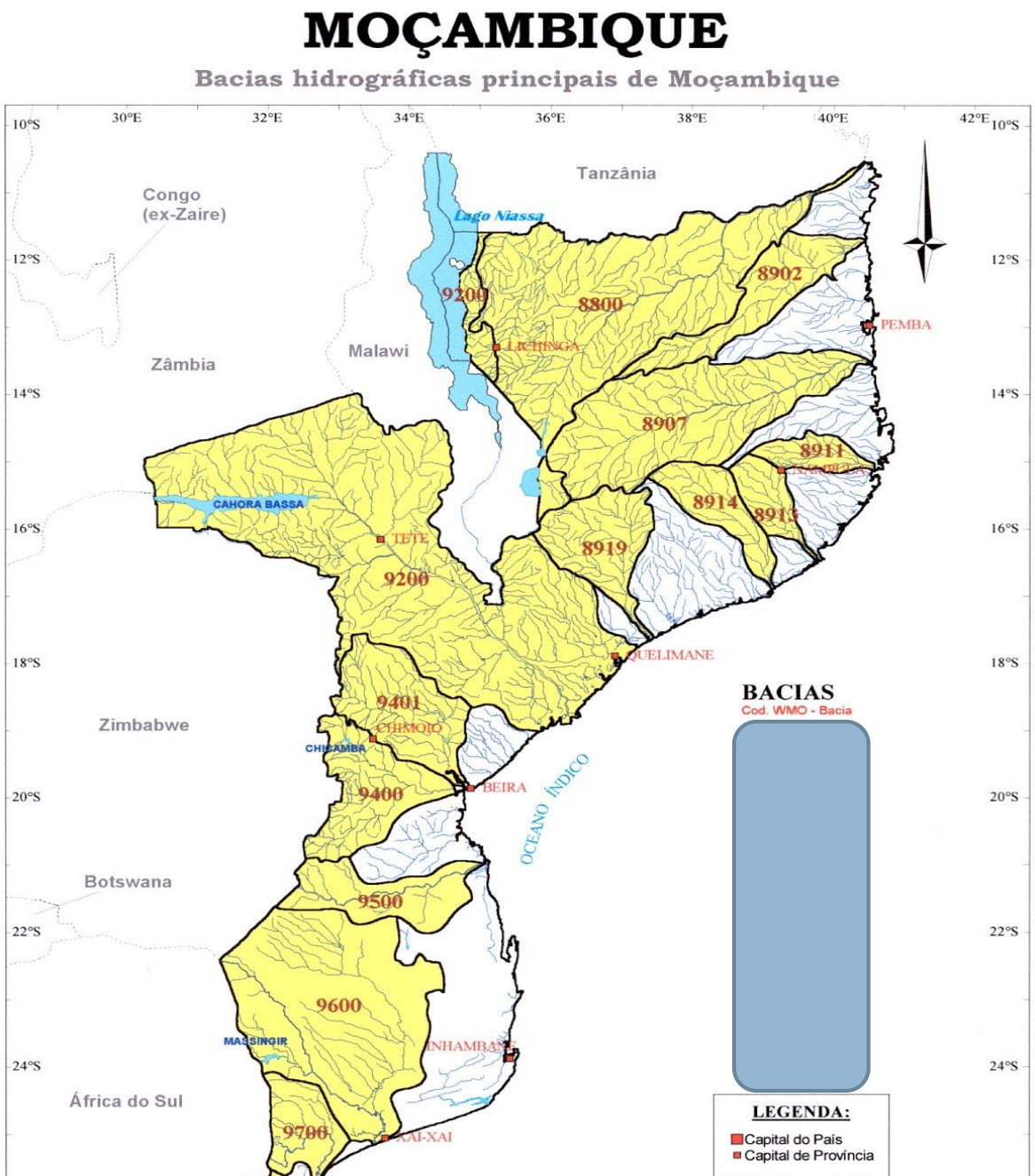
Cape Town – RSA, 25-28/11/19

República de Moçambique

CONTENTS

- Major river basins in MOZAMBIQUE
- Policy and institutional frameworks on river basin management in the country a. Policies, laws and regulations relevant to WRM
- b. Institutions responsible & their relationships
- Importance of the key river basins in the country
- Challenges facing the management of river basins
- Current and planned interventions to improve the status of the key river basins highlighting: major projects, partnerships & major outcomes
- Recommendations on next steps

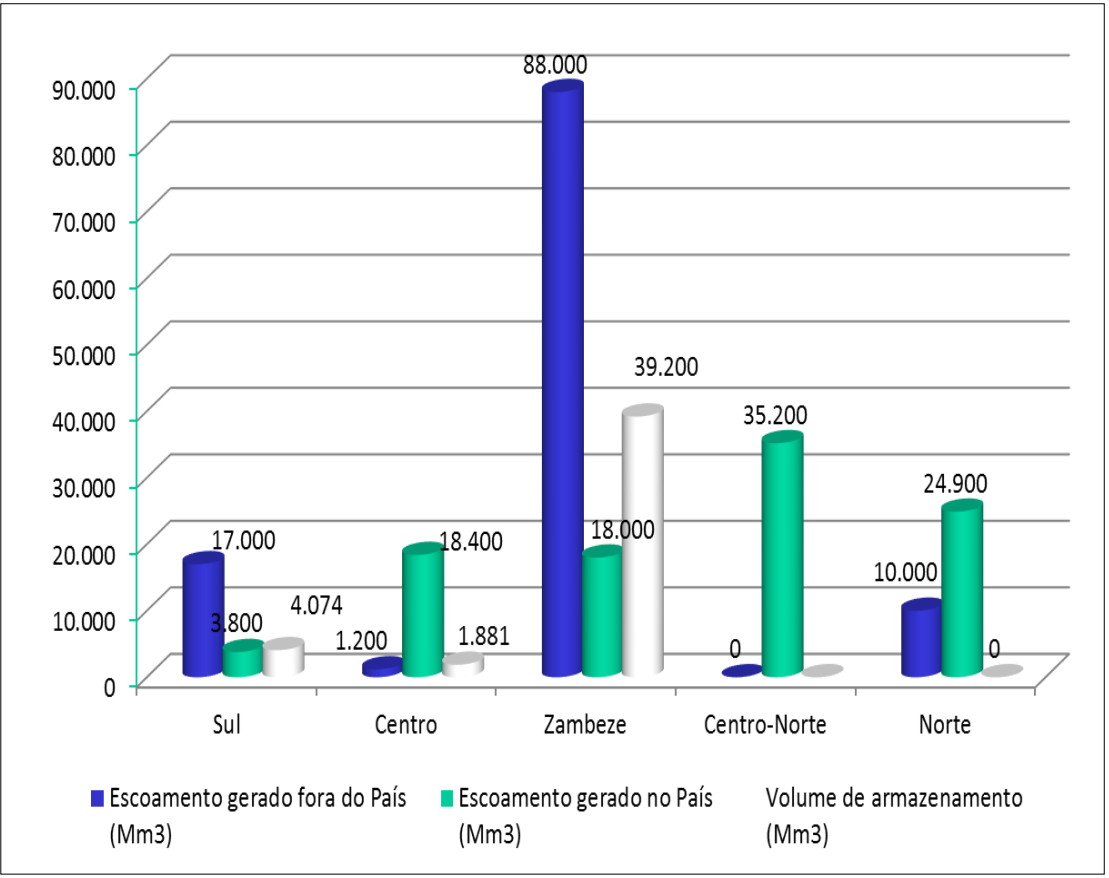
MAJOR RIVER BASINS



Mozambique has 104 hydrographical basins, being 13 considered as the major river basins:

Rovuma	
Messalo	Púngoé
Lúrio	Búzi
Monapo	Save
Meluli	Limpopo
Ligonha	Incomáti
Licungo	Umbelúzi
Zambeze	Maputo

WATER RESOURCES IN MOZAMBIQUE



The total surface drainage is about 216 km³/year. About 54% are generated in the upstream countries;

The Zambezi Basin and the Northern region have the highest availability of water resources (90%);

The Southern and Center regions have the lowest availability of water resources (10%);

The situation is aggravated by the cyclical drought events;

Mozambique is vulnerable to cyclical extreme events.

WATER RESOURCES IN MOZAMBIQUE

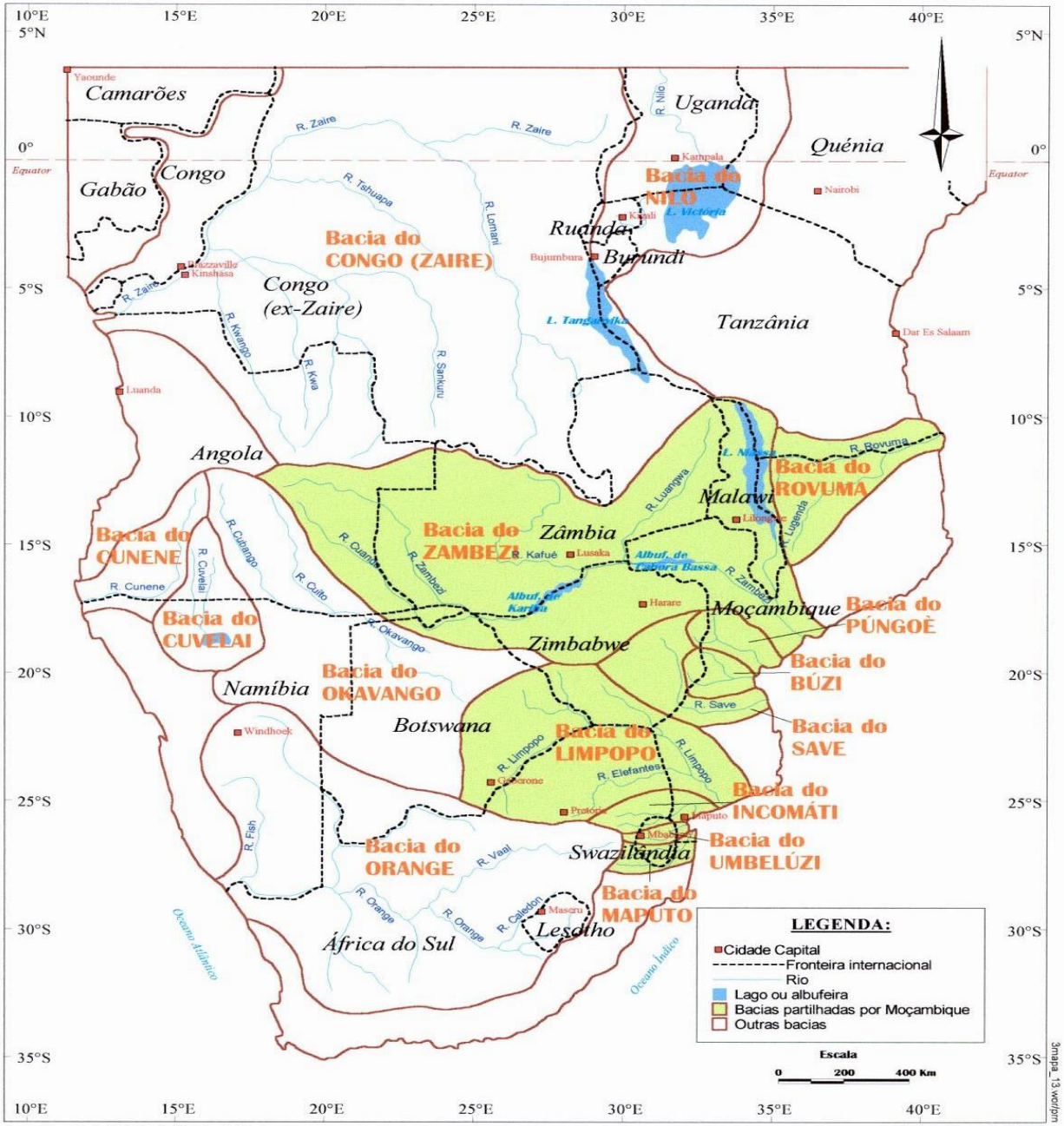
- ✓Mozambique is dependent on upstream countries as is an insufficient number of infrastructures for water storage;

- ✓There is a tendency to reduce runoff in international watersheds;
  The reduction of water flow at the border is caused by increased uses upstream and alterations of rivers due to climate change;

- ✓The quality of water is likely to be poor crossing the border as a result of upstream socioeconomic activities;

- ✓Groundwater potential is considerable and lies in the alluvial formations of the various rivers. Well yields in the Zambezi and Incomati Basins are up to 70 000 m3/day.

MAJOR RIVER BASINS – SHARED RIVER BASINS



- ✓ Mozambique is a downstream country, sharing 9 of the 15 international river basins in the SADC region;
- ✓ The geographical position puts Mozambique dependent on upstream countries;
- ✓ The SADC Protocol on Shared Rivers defines the guiding principles in this area.
- ✓ Mozambique prioritises the establishment of Joint Water Commissions and Water Cooperation – Agreements.

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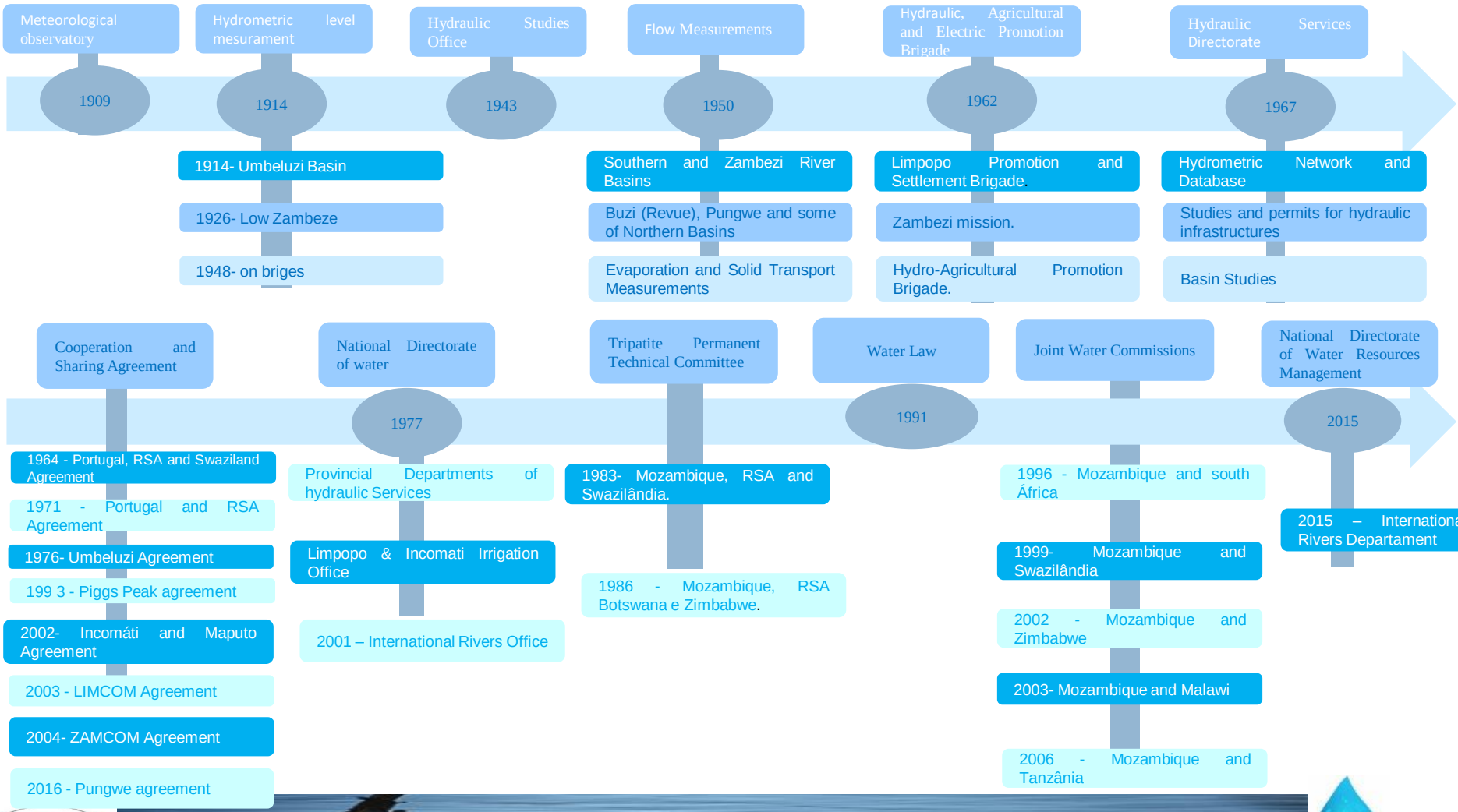
POLICY AND INSTITUTIONAL FRAMEWORK



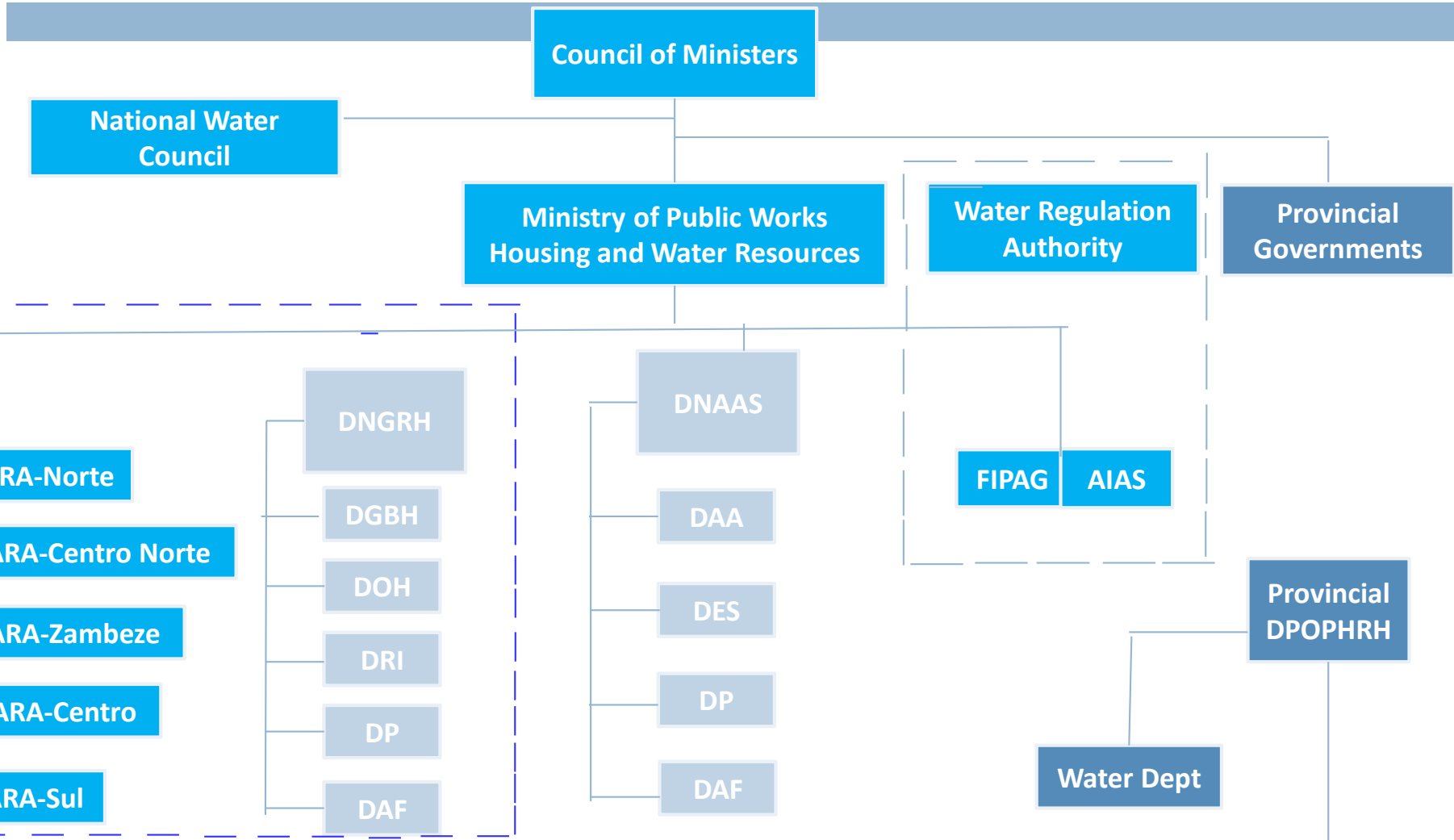
POLICY FRAMEWORK

#	LEGISLATION		CONTENT
1	Constitution	2004	Natural resources, Hydraulic potential, Environment e Public domain
2	Law	16/1991 – August, 3rd	Water Act
3	Decree	26/1991 - November, 14th	Establishment of the Regional Water Administration (ARA) (Southern, Centre, Zambezi, Centre North e North)
4	Resolution	42/2016 – December, 30th	Water Policy
5	Council of Ministers Resolution	43/2007 – August, 21st	Water Resources Management Strategy
6	Resolution	43/07 - October 30th, 2007	Regulation on Water Licences & Concessions

POLICY FRAMEWORK

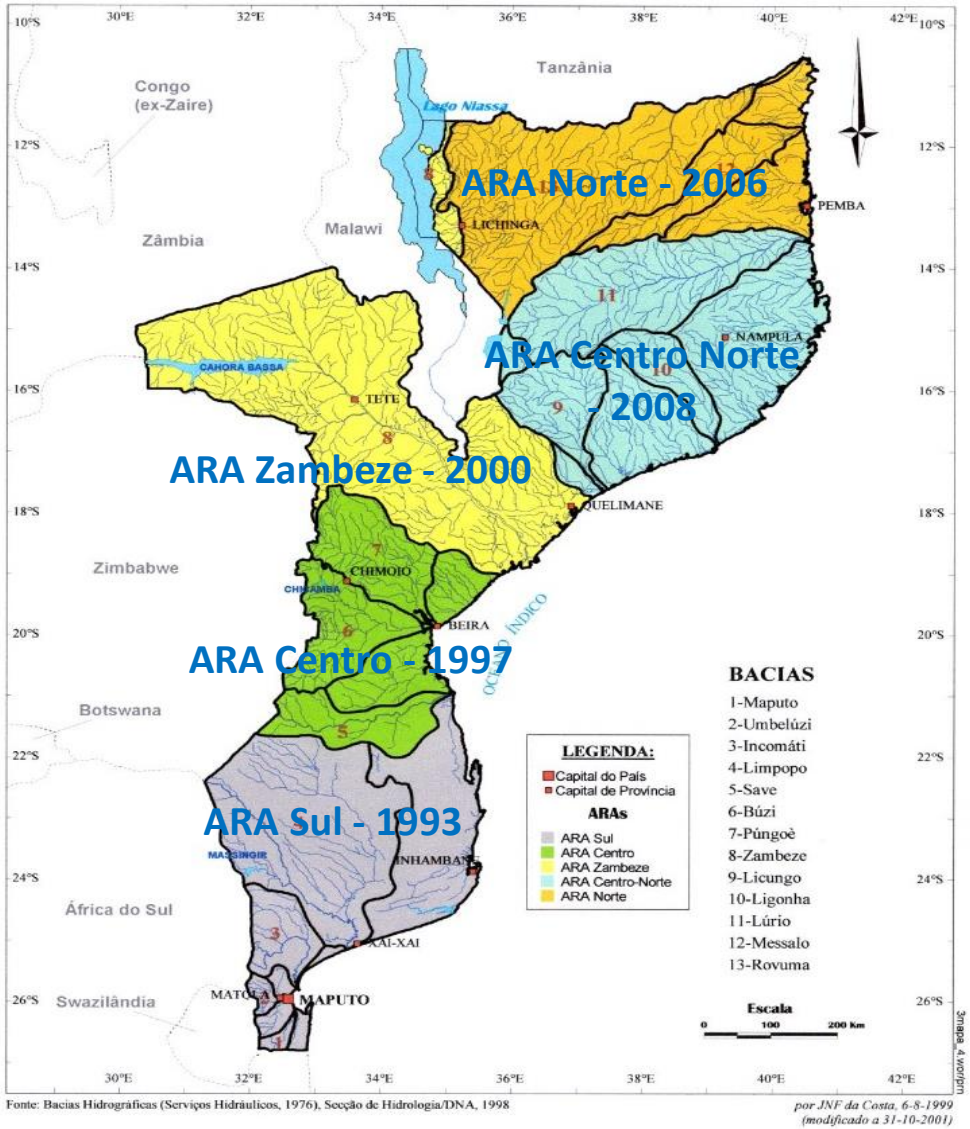
#	LEGISLATION		CONTENT
7	Decree	47/09 – October 7th, 2009	Regulation on Small Dams
8	Decree	20/16 - July 6th, 2016	Regulation on Regulated and Unregulated Raw Water Rate Fixation
9	Decree	33/17 - July 19th, 2017	Regulation on Dam Safety
10	Decree	50/17 - October 2nd, 2017	Regulation on Dam Safety and Rejects
11	Decree	29/17 - July 14th, 2017	Regulation on Use and Exploitation of Reservoirs and Lakes
12	Decree	18/12 – July, 5th, 2012	Regulation on Ground Water Survey and Exploitation

INSTITUTIONAL FRAMEWORK



DNGRH – National Directorate of Water Resources Management
DNAAS - National Directorate of Water Supply and Sanitation
DGBH – Department of River Basins Management

INSTITUTIONAL FRAMEWORK



National Directorate of Water Resources Management (DNGRH), responsible for WRM – policies, legislations

Regional Water Administrations (ARAs), established 1993 - 2008:
Sul, Centro, Centro Norte, Zambeze & Norte) - responsible for operational water resources management

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MISSION - IMPORTANCE OF THE RIVER BASINS

Water for Social development (Primary use)

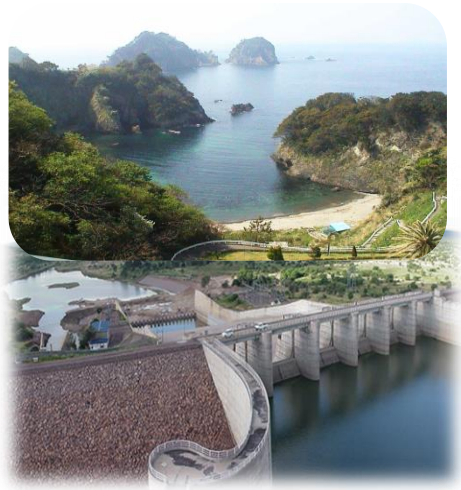
- Water Supply and Sanitation
  - Rural
  - Urban

Water for Economic development

- Agriculture
- Energy
- Transport (navegation)
- Fisheries
- Tourism & other sectors

Water & Environment

- E-flows
- Floods and droughts
- Prevention & Pollution control



WATER RESOURCES MANAGEMENT

Social Equity

Economic eficiency

Environmental sustainability

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WATER USE – DEGRADATION - IMPACTS

Water used for several purposes

FACTORS /ACTIVITIES

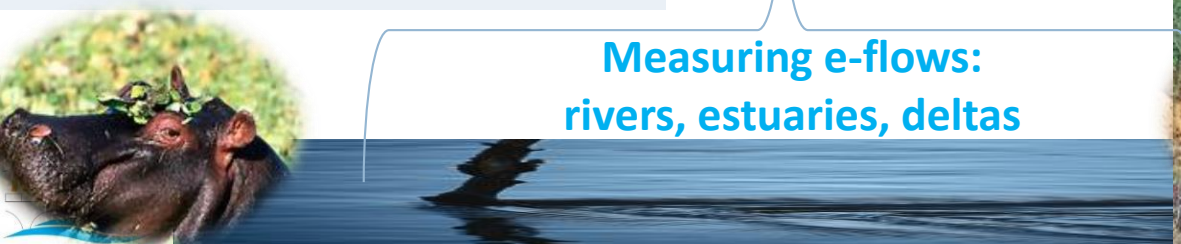
- ✓ Country geographic situation
- ✓ Population growth
- ✓ Rural exodus
- ✓ Looking for fertil land
- ✓ Proximity to fluvial transport
- ✓ Deforestation
- ✓ Erosion
- ✓ Desorganised territorial occupation
- ✓ …

IMPACTS

- ✓ Ciclical extreme events: Inundations/ droughts
- ✓ Increase of sedimentation
- ✓ Sea water raise
- ✓ Environment & water quality degradation
- ✓ Decline in biodiversity
- ✓ Aquatic weeds infestation, …

CHALLENGE

Measuring e-flows:
rivers, estuaries, deltas



CHALLENGES

Institutional Development	✓ Proceed with reforms in the water sector in order to adjust it to the current stage of socio-economic development of the country; ✓ Training and capacity building.
Infrastructures	✓ Mobilize funds for the construction of Moamba Major and Mapai dams; ✓ Complete the rehabilitation of the Massingir dam (auxiliary spillways construction and rehabilitation); ✓ Encourage the construction of small dams, reservoirs and tanks and guttering; ✓ Ensure maintenance of constructed infrastructures.

CHALLENGES

Water Resources Development	✓ Responding to demand from economic growth of the country (in particular Corridors and Development Initiatives); ✓ Improve the level of knowledge of water resources, set priorities for the provision of water in the short, medium and long terms based on the National Master Plan for Water Resources; ✓ Establish Strategic Hydro-metereological Network for hydrologic control and monitoring.
Flood management	✓ The change in approach is needed to protect against the risk of flooding: ✓ Give more space to water on the flooding valleys; ✓ Take adaptive measures in floodplains; ✓ Flood prevention through resilient infrastructure; ✓ Sustainable land planning to mitigate flood; ✓ Developing a Security Policy Against Floods; ✓ Enhance investment in Information Systems, through the rehabilitation and construction of new networks and hydro-climatological stations.

CURRENT AND PLANNED INTERVENTIONS
MAJOR PROJECTS, PARTNERSHIPS & MAJOR OUTCOMES

PROJECT	OBJECTIVE	LENGTH	PARTNER	OUTCOME
Transformação dos Serviços Hidrológicos e Meteorogicos (PPCR *Hydromet*) Climate resilience	To strengthen hydrological and meteorological information services to deliver reliable and timely climate information to local communities and to support economic development.	2012 –19	World Bank	Disseminated hydrological & metereological data and information
Improving Spacial and Topographical High Resolution Data for Flood Risk Management (LIDAR) data & de Dados Espaciais e topográficos de alta resolução para Gestão de Risco de cheias (*LIDAR*)	Flood risk areas mapping (Zambeze, Limpopo)	2015 –17	World Bank	Risk reduction /human life, socioeconomic, infrastructures

CURRENT AND PLANNED INTERVENTIONS
MAJOR PROJECTS, PARTNERSHIPS & MAJOR OUTCOMES

PROJECT	OBJECTIVE	LENGTH	PARTNER	OUTCOME
Emergency Resilient Recover (ERRP)	To respond to the need of rehabilitation of hydraulic infrastructures damaged by Licungo and Limpopo 2013 floods	2012 –19	World Bank	Vulnerabitity reduction to extreme events
National Water Resources Plan	To improve the level of knowledge on WR potential in Mozambique and Assure WRM sustainability	2016 –18	Govern of Korea	Water availability/ Water alocation for multiple purposes
Disaster risk management related to water	To strengthen institutional capacity of DNGRH and ARAs – Licungo River Floods Management - Pilot project	2015 –17	Govern of Japan	Capacity strenghthend : hidrometereological data and information collection, forecast and dessimination

CURRENT AND PLANNED INTERVENTIONS
MAJOR PROJECTS, PARTNERSHIPS & MAJOR OUTCOMES

PROJECT	OBJECTIVE	LENGTH	CURRENT PHASE	OUTCOME
National Water Resources Development Program World Bank 2016 - 2020				Basin planning Increase Water capacity of the reservoir
Limpopo Floods Management	WR Development	2016-19	Investment Plans	
Lurio Strategic plan		2016-19	Investment Plan	
Zambeze Strategic Plan		2016-19	Cenarios development	
Conclusion of the construction of the Corumana Dam		2015-20	Civil works and Resettlement Action Plan	

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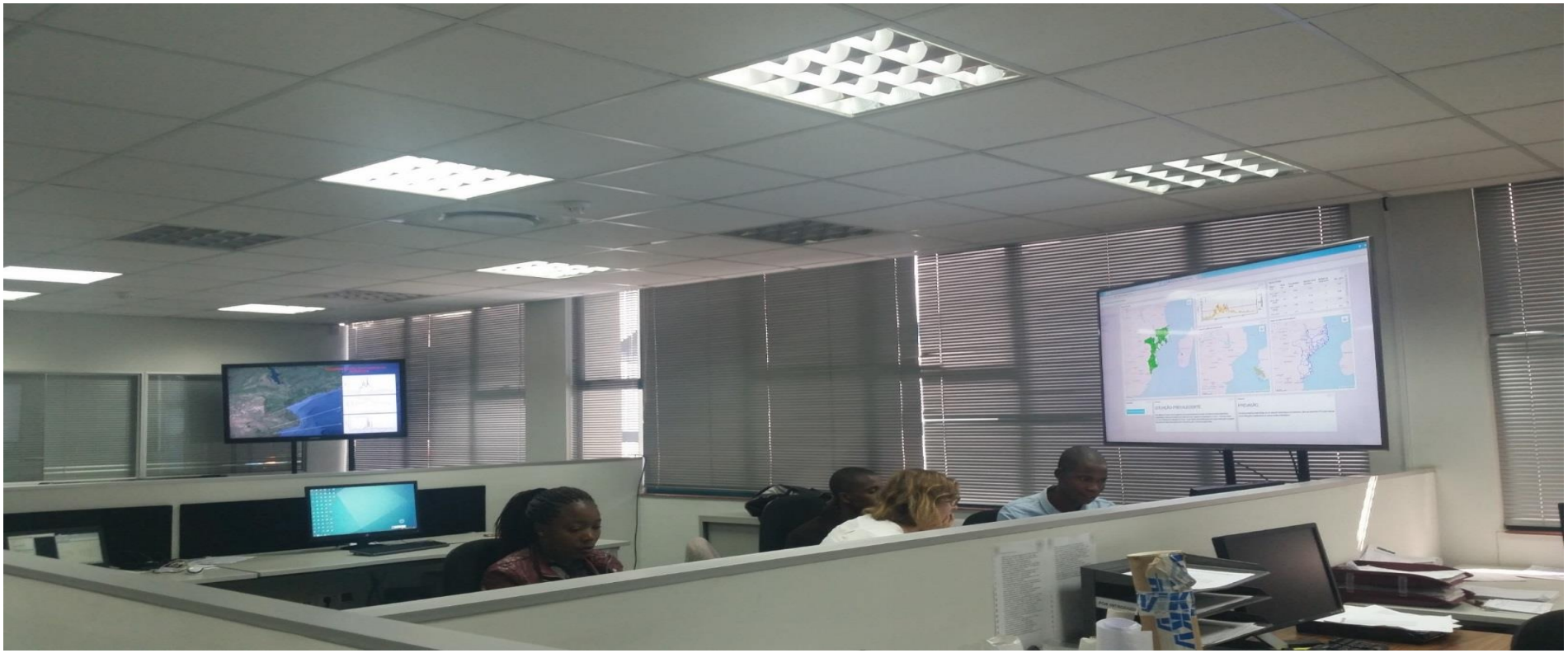
CURRENT AND PLANNED INTERVENTIONS
MAJOR PROJECTS, PARTNERSHIPS & MAJOR OUTCOMES

PROJECT	OBJECTIVE	LENGTH	PARTNER	OUTCOME
Water quality monitoring and database	Buletin issued every three months	-	-	To report the quality of surface water & provide with good water quality for multiple uses
Ground water database	Ground water database To assess GW potential for Water supply	2019 - 2021	-	To monitor the quality of ground water
Construction of Dykes	Flood protection	2016-2018	World Bank	Climate resilience
Water Quality Standards	Develop a legal framework Establish pollution rates (polluter pay principle)			WQ standards develop for WQ monitring
Floods and Drought Management Unit		-	-	National Water Resources Management

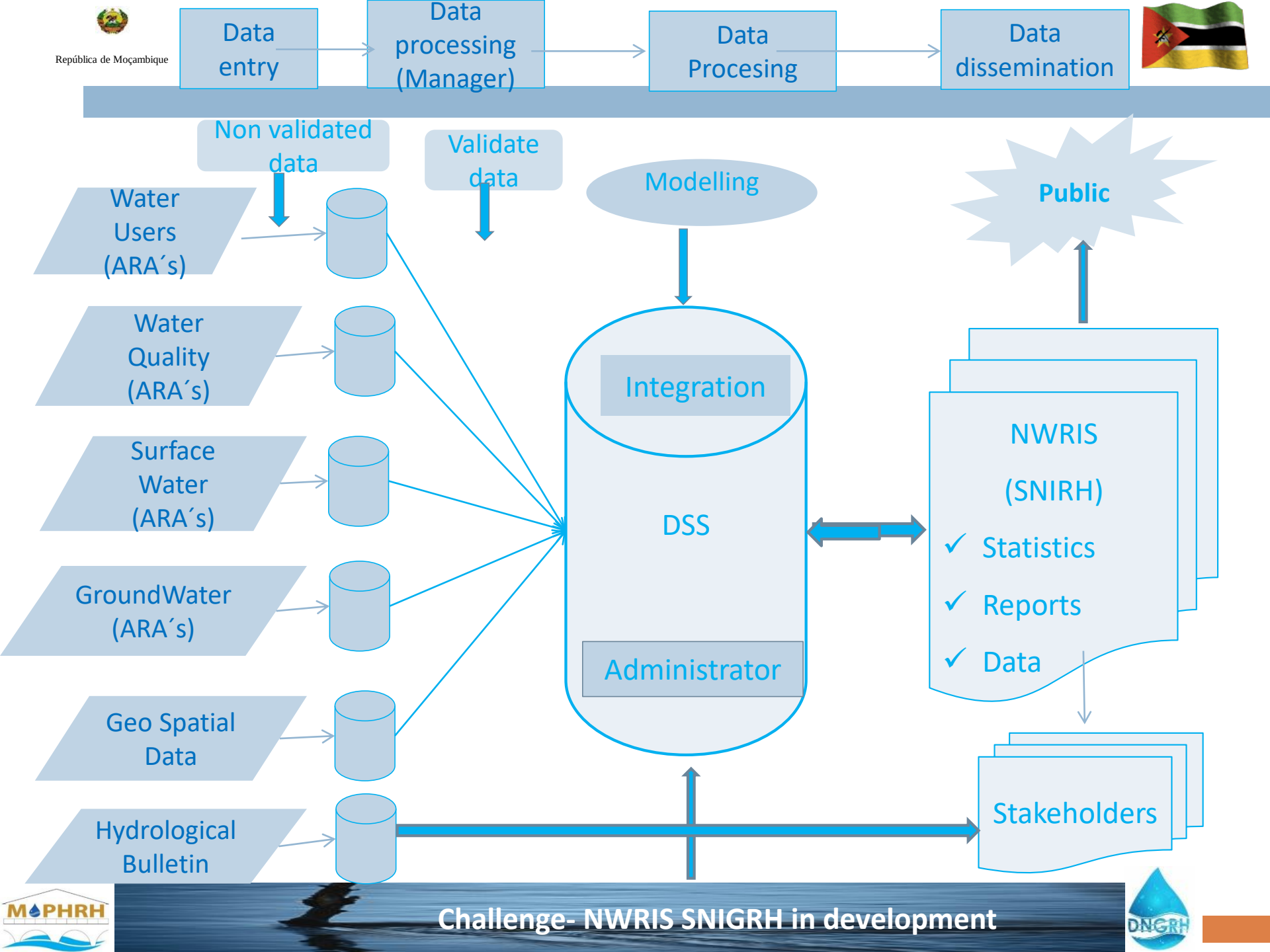
Unit for Floods & Droughts Management Established



Analysis, data/Information collection & dissemination

Online - *http:/mail.dnaguas.gov.mz:8080/dasboard*

- ✓ ***whatsapp***
- ✓ ***Email***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Data entry
Data processing (Manager)
Data Procesing
Data dissemination
Non validated data
Validate data
Modelling
Public
Water Users (ARA´s)
Water Quality (ARA´s)
Surface Water (ARA´s)
GroundWater (ARA´s)
Geo Spatial Data
Hydrological Bulletin
Integration
DSS
Administrator
NWRIS
(SNIRH)
✓ Statistics
✓ Reports
✓ Data
Stakeholders
MOPHRH
Challenge- NWRIS SNIGRH in development
DNGRH

Up-dating flood management methodologies (run-off analysis using Global Geological Data

Global Geological data for modeling Elevation data, Land use data, etc.

Ground rainfall and Satellite-based rainfall

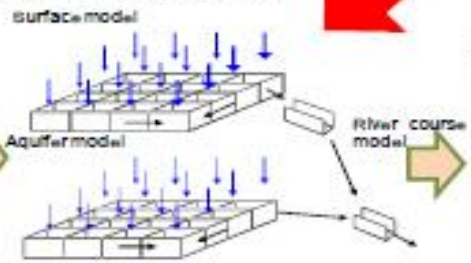
input

input

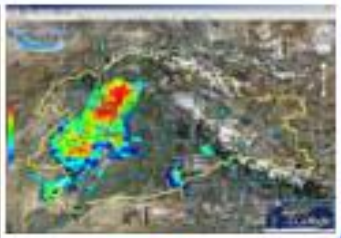
Model creation

IFAS

Run-off analysis



River discharge, Water level, Rainfall distribution



Reach to the warning level

Alert message by E-mail and on the display for river management authorities

Judge by River management authorities

Evacuate from dangerous areas

RECOMMENDATIONS

Water is a renuable and scarce resource, vital for sustaining life and ecossystems;

Eflows are related to three main factors, namely: the runoff, sazonality and water quality;

Critical aspects to consider include the need to:

- ✓ Give way to water;
- ✓ Get a better understanding on eflow and the methodologies for EFR;
- ✓ Participate in negotiation processes with consolidated information on EFR for planning of activities as well as discussions on water alocation;
- ✓ Integrate detailed studies on eflows in Shared Water Agreements as to reach to more realistic and fiable figures;

Establish a national capacity for eflows assessment.

RECOMMENDATIONS

- ✓ Attend short courses and post-graduate degrees in E flows at university;
- ✓ National assessment of river status - detailed studies on selected basins;
- ✓ Develop a National River Health monitoring programme;
- ✓ Workshop to examine E flow methodologies in Estuaries and Deltas;
- ✓ Selection of river basin for training and projects on e-flows;
- ✓ Conducting advanced training on e-flows assessment;
- ✓ Develop a river classification system;
- ✓ Adopt a consistent framework for EFA;
- ✓ Develop a Legal instrument for overall water allocation;
- ✓ National database – E flows embedded in broader database on water generally;
- ✓ Introduce E flows into Basin plans.

For Sustainable IWRM

THANK YOU

alnomboro@yahoo.com.au
&
mahiquecristina@gmail.com