

MOZAMBIQUE: Key Water Challenges and Opportunities

WORKSHOP ON "THE STATE OF WATER IN SOUTHERN AFRICA: MOZAMBIQUE, NAMIBIA, MAURITIUS, ZAMBIA AND ZIMBABWE

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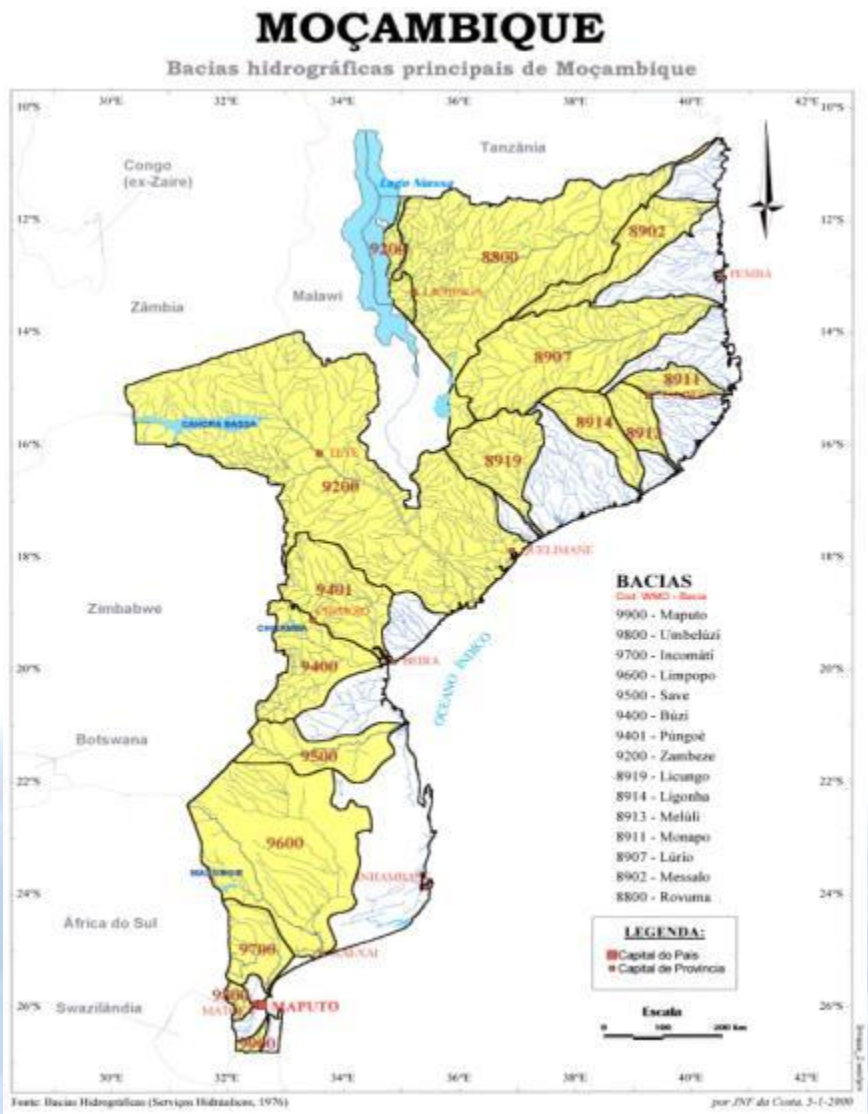
Other references and source along the presentation.

PRESENTATION LAYOUT

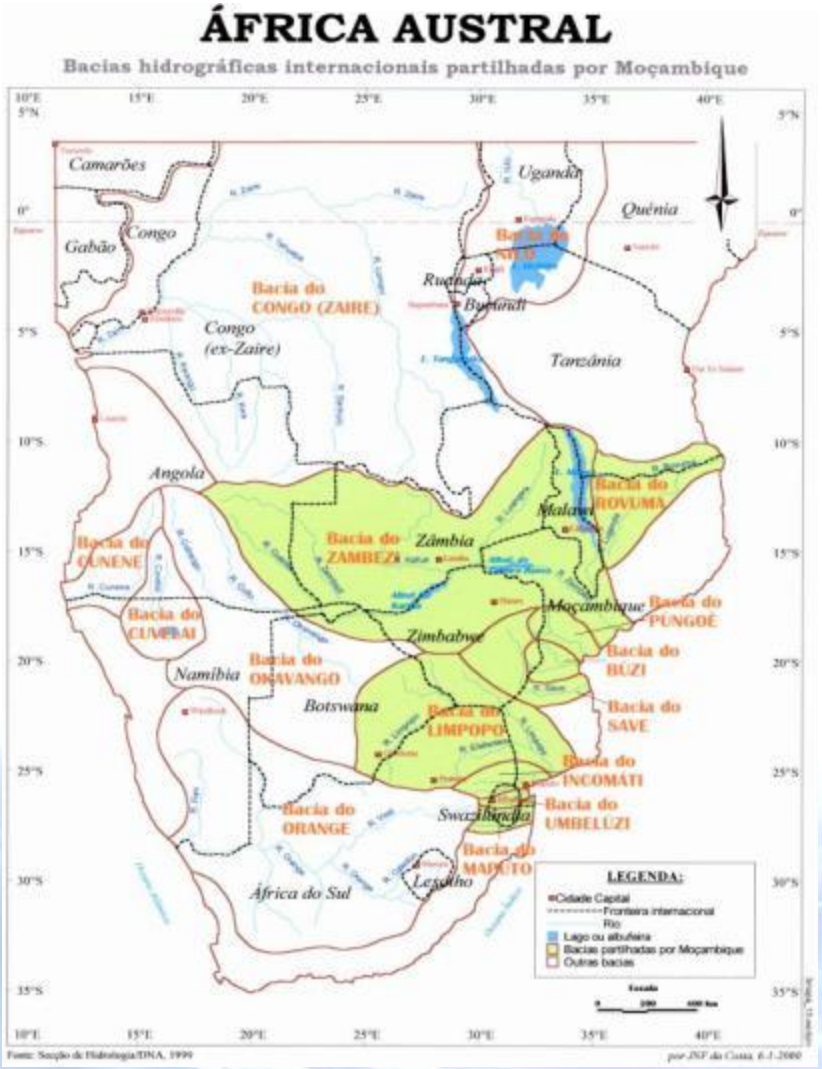
- WATER RESOURCES IN MOZAMBIQUE
- WATER GOVERNACE AND MANAGEMENT: LEGAL AND INSTITUTIONAL REFORMS
- MAJOR CHALLENGES ON WATER RESOURCES MANAGEMENT AND GOVERNANCE
- CHALLENGES AND OPPORTUNITIES IN WATER SUPPLY AND SANITATION SECTOR
- CHALLENGES AND OPPORTUNITIES IN WATER SECTOR

WATER RESOURCES MANAGEMENT IN MOZAMBIQUE



- *Population of the country **22 million** with an average density of **26 inhabitant per square km**.*
- *Main source of water is **surface water** with more than **104** identified **river basins**.*
- ***13 major river basins***
- ***Unbalanced spatial and temporal distribution of rainfall and runoff;***
- ***MAR 216 Mm^3 (>50% generated upstream, and 90% in the Zambezi basin)***
- *recurring extremes **water shortages** and **floods***
- ***Limited water storage capacity less than 5% of MAR***

WATER RESOURCES MANAGEMENT IN MOZAMBIQUE:
REGIONAL CONTEXT



- *Mozambique shares 9 of 15 SADC transboundary watercourses*
- *Always downstream, except in the Rovuma River*
- *Joint Water Commissions*
- *Technical Committees*
- *Cooperation and water sharing agreements*
- *SADC Revised Protocol on Shared Watercourses*

WATER RESOURCES MANAGEMENT IN MOZAMBIQUE: REGIONAL CONTEXT

MAIN FEATURES OF THE REGION

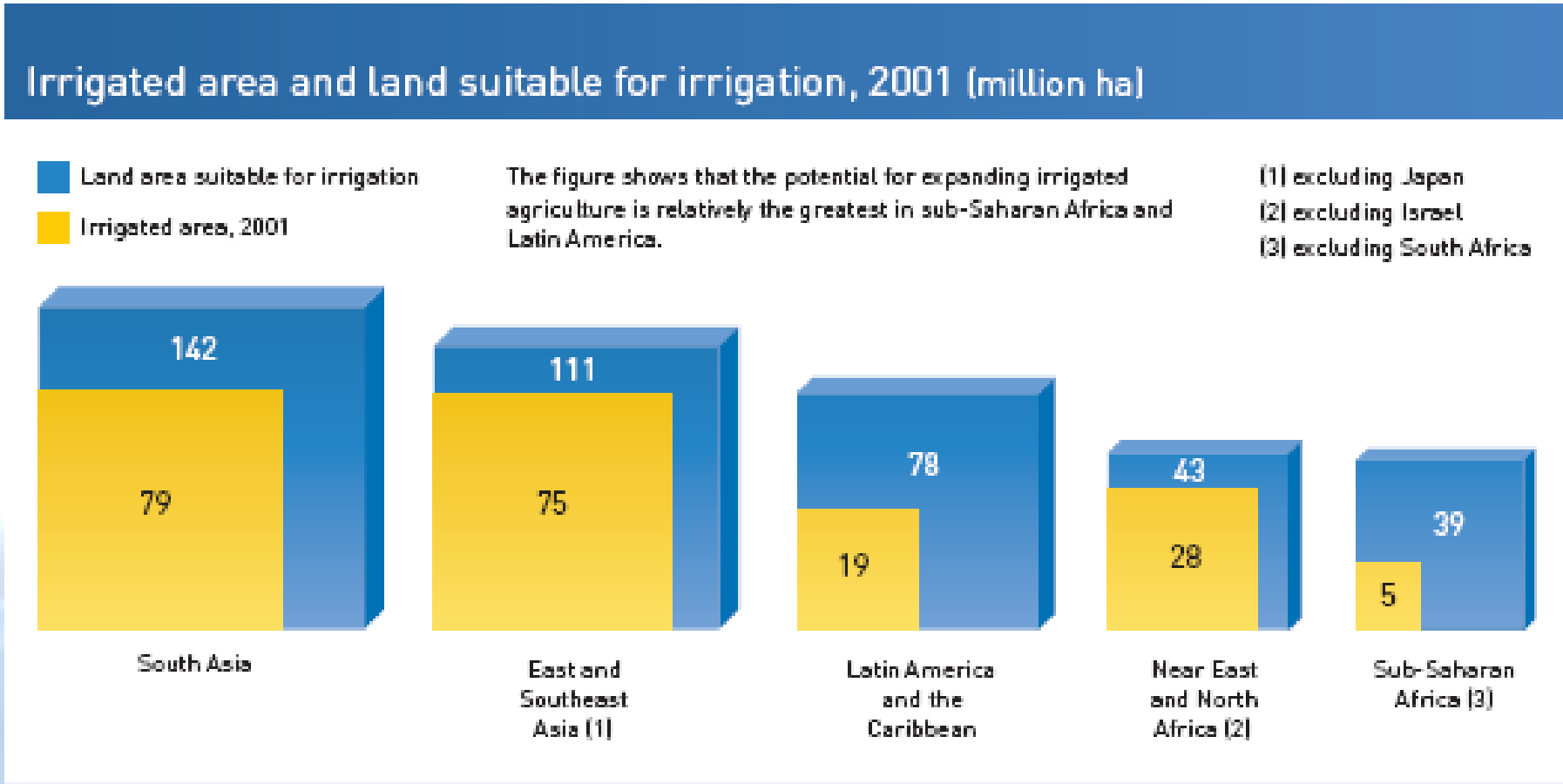
Water Barrier Scale projection for selected SADC countries compared with Israel and Jordan, 1950-2025. (Flow unit = one million m^3 of water per year)

	Well Watered <100 persons per 'flow unit'	Mid-European 100-600 persons per 'flow unit'	Water Stressed 600-1000 persons per 'flow unit'	Chronic Scarcity 1000-2000 persons per 'flow unit'	Beyond Water Barrier >2000 persons per flow unit
1950	Zimbabwe South Africa Mozambique Swaziland			Israel Jordan	
1960	Zimbabwe South Africa Mozambique Swaziland			Israel	Jordan
1970	Mozambique	Zimbabwe South Africa Swaziland		Israel	Jordan
1982	Mozambique	Zimbabwe South Africa Swaziland			Jordan Israel
2000	Mozambique	Zimbabwe Swaziland	South Africa		Jordan Israel
2025		Mozambique Swaziland	Zimbabwe	South Africa	Jordan Israel

Source: Reproduced from Suki Jobson (1999) added data for Mozambique and Swaziland based on population projections obtained in UNECA, 2006 .

WATER RESOURCES MANAGEMENT IN MOZAMBIQUE: GLOBAL CONTEXT

IMPACT OF DEMOGRAPHIC GROWTH



Source: FAO – Water at a Glance

WATER RESOURCES MANAGEMENT: LEGAL FRAMEWORK & REFORMS

Year	Event	Year	Event
1991	National Water Law	2003	Law of Local State Organs, extension of powers, responsibilities, and budget lines to districts and provinces
1992	Final Peace Accords	2004	Water Quality Regulations
1995	National Water Policy 1	2006	National Poverty Reduction Strategy II
1997	Decentralization Law	2007	National Water Policy 2
1998	Establishment of FIPAG and CRA (Asset holder and regulator, respectively, for delegated management of water supply in major cities)	2007	Completion of National Rural Water and Sanitation Strategic Plan
1998	Water Tariff Policy approved	2009	Establishment of a new management model for secondary cities and towns, including Provincial Water and Sanitation Services (SPAS), a national Water and Sanitation Infrastructure Administration (AIAS), and extension of the mandate of the sector regulator (CRA)
2002	Creation of ASAS, first budget support instrument for the water sector	2010	PRONASAR and common fund established for rural water and sanitation

Source: Water supply and sanitation in Mozambique: turning finance into services for 2015 and beyond
An AMCOW Country Status Overview

WATER RESOURCES MANAGEMENT: LEGAL FRAMEWORK & REFORMS

- **The Water Law**
  - ✓ Approved in 1991
  - ✓ Defines the general principles for water resources management:
    - Institutional coordination, water users participation, harmonization of national water policies, river basin as the management unit.
  - ✓ Provision for De-concentration and Decentralization of Operation Water Resources Management to Regional and Local Levels
  - ✓ Sets and Separates roles and responsibilities for Strategic and Operational Management of Water Resources
  - ✓ Provision for Establishment of Regional Water Administrations (ARA´s)

WATER RESOURCES MANAGEMENT: LEGAL FRAMEWORK & REFORMS

The Water Policy

- ✓ Approved in 1995
  - ✓ Mainly focused on water supply (urban and rural)
- ✓ Revised in 2007
- ✓ Define the general objectives and policies:
  - Meeting the basic needs, improve sanitation, water needs for economic development and environment, reduction of vulnerability, inter-sectors coordination and planning, promote peace and regional integration
  - Integrated water resources management, Integration of water supply, sanitation and hygiene, emphasis on the role of government, private sector and stakeholders, institutional capacity building, economic value of water
- ✓ Harmonization of national with regional legislation (SADC Revised Protocol, IIMA, etc)

WATER POLICY: THE MAIN PILLARS FOR IWRM

Water for Human Basic Needs

- **Rural** — Water Supply & Sanitation
- **Urban** — Water Supply & Sanitation

Water for Development

- **Agriculture**
- **Power Generation**
- Industry
  Fisheries
  Tourism

Water for Environment

- Rural & Urban Sanitation
- Ecological Flows
- Pollution/ Water Quality

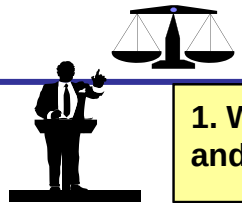
Integrated Water Resources Management

- **The National Water Resources Management Strategy**

  - ✓ Approved in 2007
  - ✓ Guide implementation of the Water Policy
  - ✓ Set priorities for short, medium and long term on:
    - Water resources management and Development
    - Water supply and sanitation
    - Water for socio-economic development
    - Investments
    - Private Sector Participation
    - Institutional capacity building

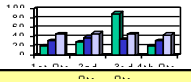
NATIONAL WATER RESOURCES MANAGEMENT STRATEGY

Building Blocks



1. Water policy and Water Law

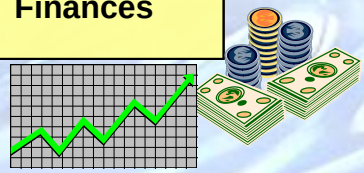
2. Institutional Capacity Building and Human Resources Development



3. Water Resources Data, Information and Knowledge

4. Water Resources Development

5. Economy, Investments and Finances



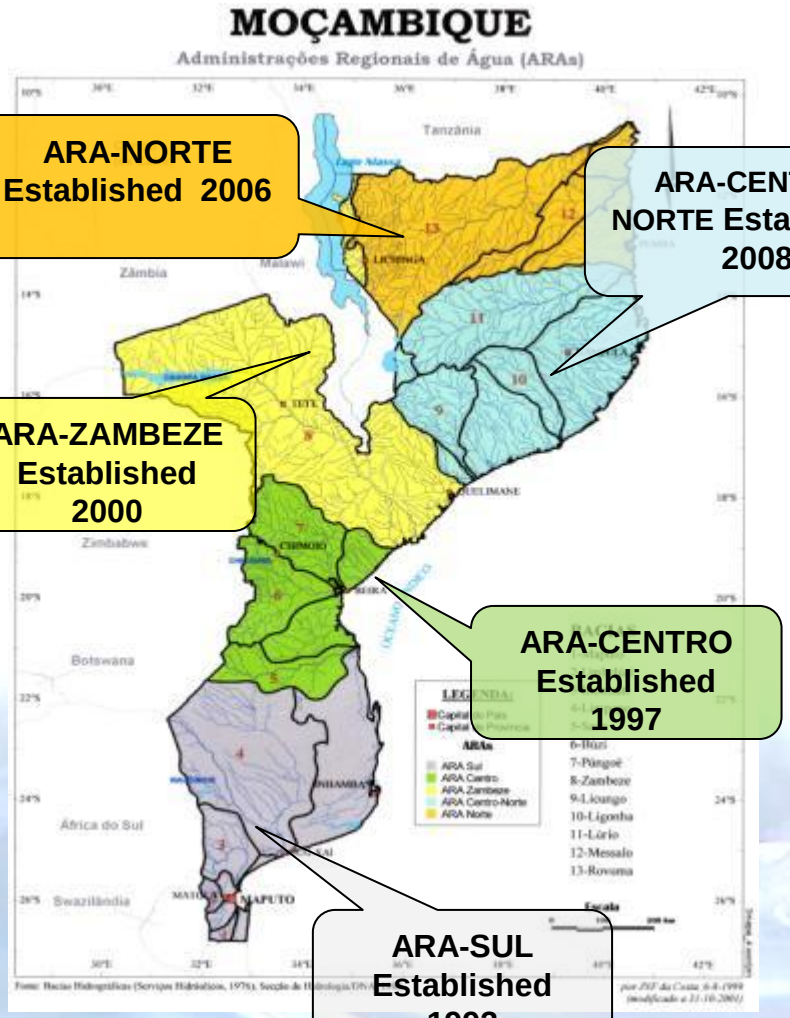
6. Water and Environment

7. Shared Watercourses

8. Public Awareness and Stakeholders Participation

Sustainable and Equitable Utilization of Water Resources, and Efficient Floods and Droughts Mitigation

INSTITUTIONAL REFORMS:
DECENTRALIZATION OF WATER RESOUCES MANAGEMENT



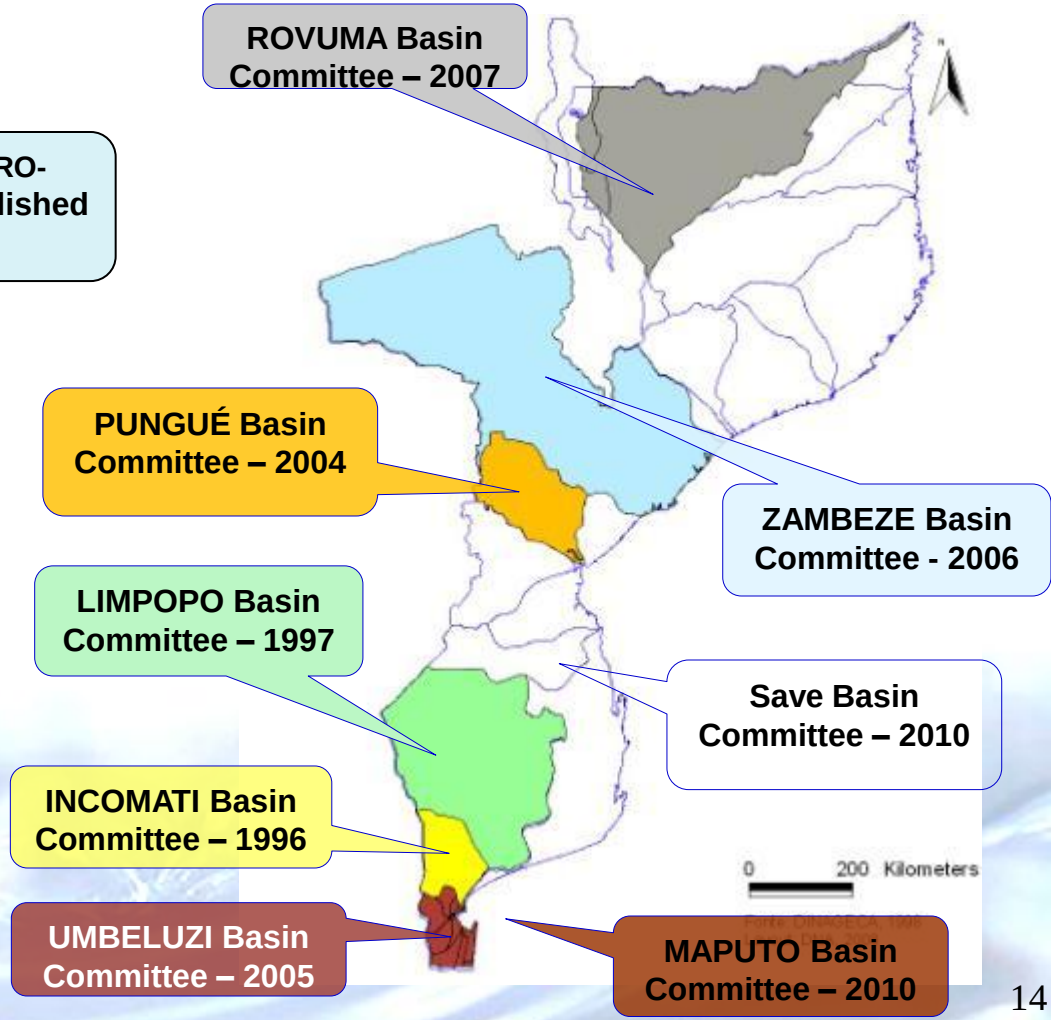
ARA-NORTE Established 2006

ARA-CENTRO-NORTE Established 2008

ARA-ZAMBEZE Established 2000

ARA-CENTRO Established 1997

ARA-SUL Established 1993



ROVUMA Basin Committee – 2007

PUNGUÉ Basin Committee – 2004

ZAMBEZE Basin Committee - 2006

LIMPOPO Basin Committee – 1997

Save Basin Committee – 2010

INCOMATI Basin Committee – 1996

UMBELUZI Basin Committee – 2005

MAPUTO Basin Committee – 2010

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INSTITUTIONAL REFORMS:
THE MAIN PLAYERS

1. NATIONAL WATER COUNCIL

- Multi-sectorial´s Council of Ministers Consultative body for strategic water resources management and policy issues;

2. NATIONAL DIRECTORATE FOR WATER

- Integrated and strategic water resources management, and water supply and sanitation at national level;

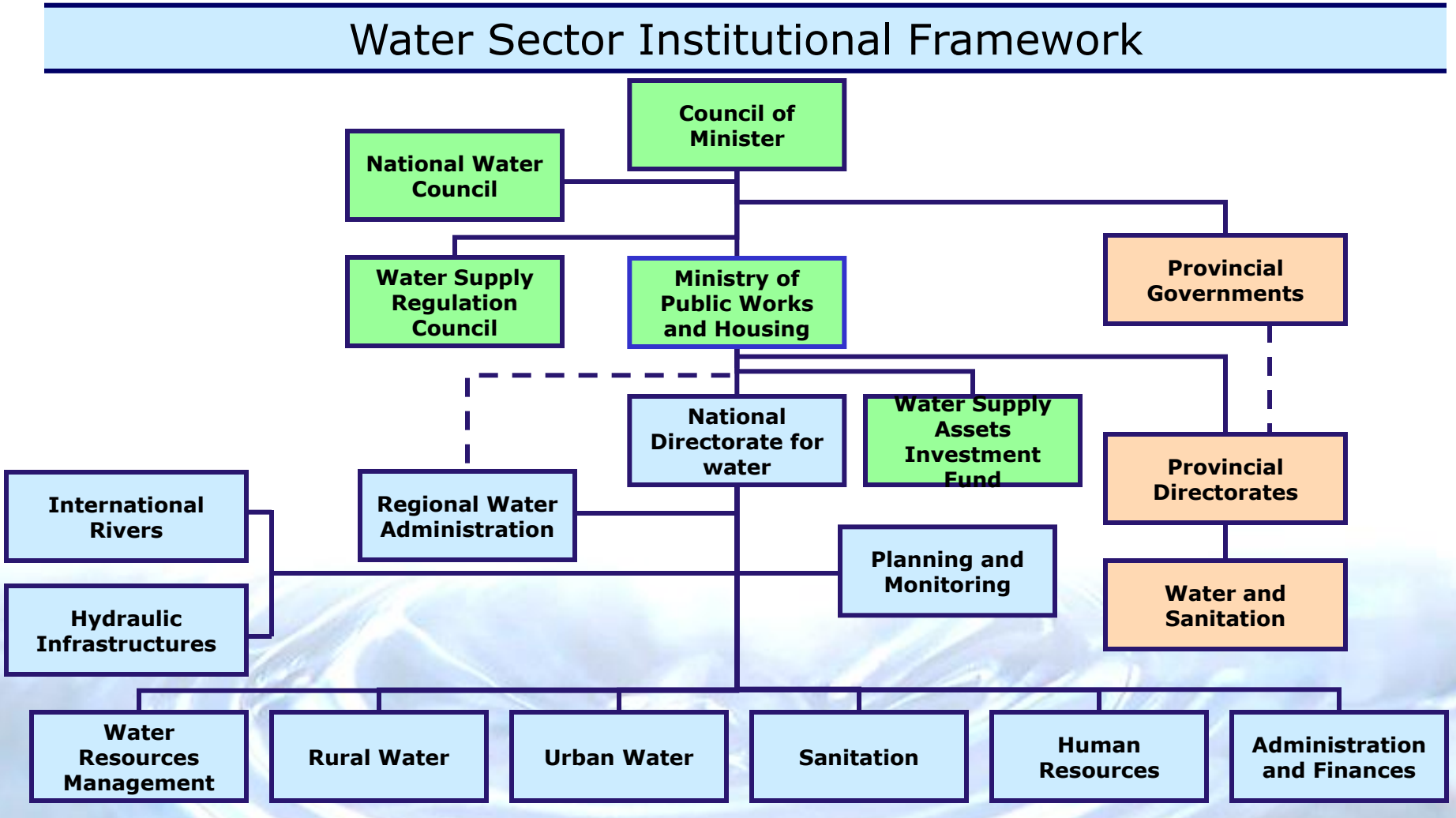
3. REGIONAL WATER RESOURCES MANAGEMENT INSTITUTIONS (ARA´s)

- Operational management of water resources at regional and basin levels;

4. STAKEHOLDERS BASIN COMMITTEES

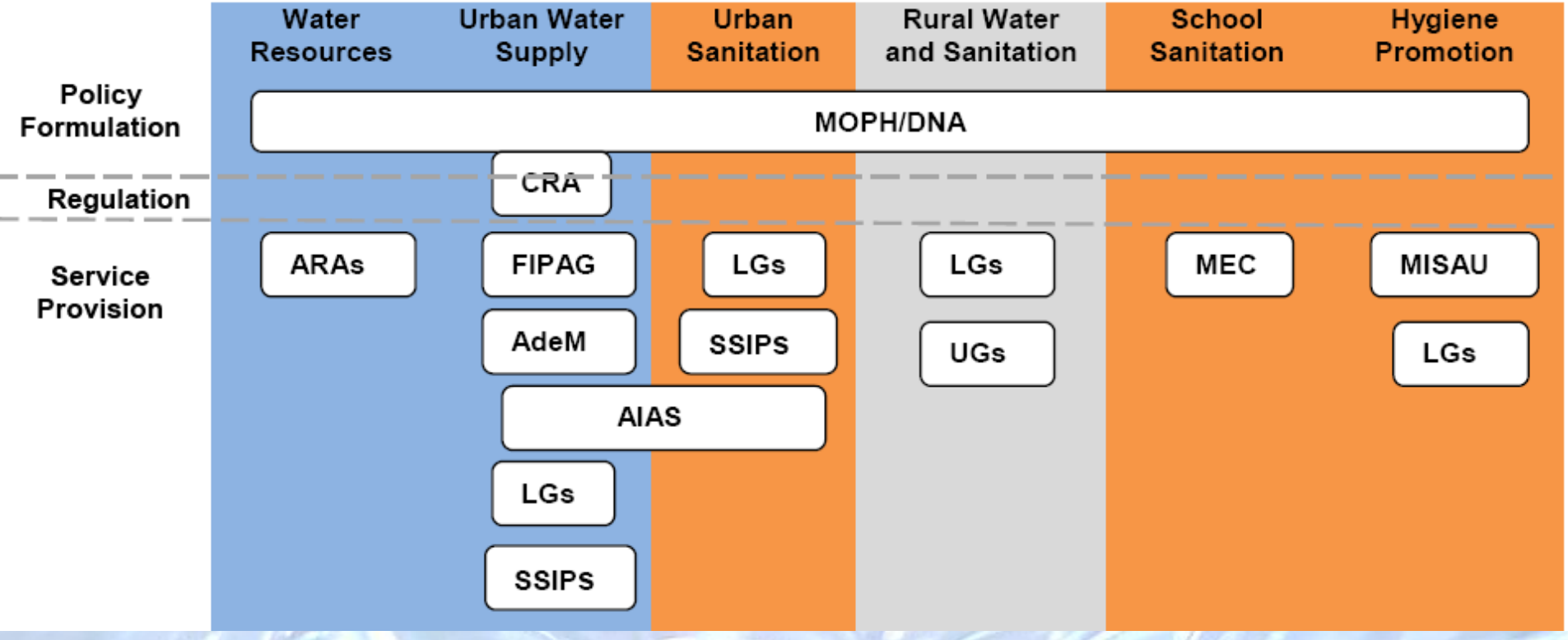
- Stakeholders participation on water resources management and decision making

INSTITUTIONAL REFORMS:



INSTITUTIONAL REFORMS:

Water Sector Institutional Framework



Source: Water supply and sanitation in Mozambique: turning finance into services for 2015 and beyond An AMCOW Country Status Overview

LEGAL AND INSTITUTIONAL WATER SECTOR REFORMS:

THE MAJOR BENEFITS

- Decentralization of water resources management to regional and basin level by setting up sound river basin institutions (regional and basin management levels);
- Establishment of coordination mechanisms between central (strategic) and regional (operational) functions;
- Institutional capacity building at various levels;
- Clarification of roles and responsibilities of different players at national, regional and basin levels within the water resources management chain;
- Commitment and Empowerment of stakeholders through participation in process of management and decision making (basin committees);
- Improved water resources management (water allocations and licensing mechanisms, water charges system, water quantity and quality monitoring programs, O&M of hydraulic infrastructures);
- Improved early warning systems;

INTEGRATED WATER RESOURCES MANAGEMENT:
THE MAIN CHALLENGES ON WATER GOVERNANCE

- Proceed with the implementation of the provisions of the Water Law, Water Policy and the National Water Resources Management Strategy: promote IWRM, equity, efficiency and sustainability;
- Ensure Central Government role and involvement for an effective and balanced decentralization process (support and coordination issues);
- Continue to promote active participation of stakeholders in process of management and decision making on water resources issues as a way to get commitment and enhance water governance;
- Strength the Capacity of the Regional Water Management institutions (ARAs) on management of water resources and the monitoring of the international agreements of shared watercourses;
- Building water governance: adaptive management - process consolidates over time through continuous assessment, harmonization of laws and policy and reforms

SWOT analysis for Mozambican water sector

Strengths	Weaknesses
S1. Updated Water Policy and Water Resources Management Strategy **S2. Existence of River Basin Committees** **S3. Water pricing policy being implemented** **S4. Existence of adequate institutional arrangement to gather data** **S5. Existence of transboundary agreements of conflict resolution in the international river basins**	**W1. Fragmented management of the water resources sector** **W2. Weak legislative structure** **W3. Low human resource capacity building in the water sector institutions** **W4. Inexistence of water resources management plans at river basin level** **W5. Lack of civil society participation into the water resources management** **W6. Weak financial structure**
Opportunities	**Threats**
O1. Political will for the effective implementation of the IWRM **O2. Donor will to fund projects focused on IWRM** **O3. Pro-active civil society that is aware of the importance of an efficient water resources management** **O4. Existence of regional educational networks that offers specific training opportunities in IWRM** **O5. Decentralization of political power**	**T1. Climate change** **T2. Brain drain in the water sector** **T3. District empowerment (lack of coordination)** **T4. Global virtual water trade** **T5. Slow institutional transformation**

Source: Ayala & Juízo, 2010

Weighing the SWOT leading to A'WOT

SWOT group	Group Priority	SWOT factors	Factor priority within the group	Overall factor priority
Strengths	**0.172**	S1. Updated Water Policy and Water Resources Management Strategy	0.195	0.034
		S2. Existence of River Basin Committees	0.184	0.032
		S3. Water pricing policy being implemented	0.132	0.023
		S4. Existence of adequate institutional arrangement to gather data	***0.322***	***0.055***
		S5. Existence of transboundary agreements of conflict resolution in the international river basins	0.167	0.029
Weaknesses	**0.252**	W1. Fragmented management of the water resources sector	0.102	0.026
		W2. Weak legislative structure	0.104	0.026
		W3. Low human resource capacity building in the water sector institutions	***0.247***	***0.062***
		W4. Inexistence of water resources management plans at river basin level	***0.200***	***0.050***
		W5. Lack of civil society participation into the water resources management	0.111	0.028
		W6. Weak financial structure	***0.236***	***0.060***
Opportunities	**0.401**	***O1. Political will for the effective implementation of the IWRM***	***0.319***	***0.128***
		O2. Donor will to fund projects focused on IWRM	***0.138***	***0.055***
		O3. Pro-active civil society that is aware of the importance of an efficient water resources management	***0.173***	***0.069***
		O4. Existence of regional educational networks that offers specific training opportunities in IWRM	***0.159***	***0.064***
		O5. Decentralization of political power	***0.211***	***0.085***
Threats	**0.174**	T1. Climate change	0.104	0.018
		T2. Brain drain in the water sector	***0.371***	***0.065***
		T3. District empowerment (lack of coordination)	0.173	0.030
		T4. Global virtual water trade	0.075	0.013
		T5. Slow institutional transformation	0.277	0.048

OUTLOOK – RESEARCH

- ✓ THE EMERGENCE OF WATER STRESSED COUNTRIES IN THE SADC REGION WILL EVENTUALLY TRIGGER IN LARGE SCALE WATER TRANSFER SCHEMES. – HOW DO THESE WORK?
- ✓ MODELING OF INTERCONNECTED SYSTEMS WILL SOON BECOME NECESSARY AS PART OF DECISION SUPPORT IN THE REGION. TRANSCENDING RIVER BASINS FOR BENEFIT SHARING.
- ✓ RESEARCH IS ALSO NECESSARY IN ORDER TO INFORM THE POLICY ON ECONOMIC DEVELOPMENT TAKING THE ADVANTAGE OF THE FREE TRADE ZONE AND REGIONAL INTEGRATION.

Key Challenges

- **CAPACITY BUILDING REMAINS CENTRAL ELEMENT DEVELOP COMPETENCE IN ANALYSING COMPLEX AND EVER CHANING SYSTEMS .**
- **THERE IS A NEED FOR MORE TRANSPARENT AND ROBUST TOOLS TO GUIDE DECISION MAKING.**
- **ACTION IS REQUIRED IN ORDER TO INCREASE THE INTEGRATION OF WATER QUALITY ASPECT IN WATER MANAGEMENT.**
- **HIGH CLIMATIC VARIABILITY (NOT YET ON CLIMATE CHANGE) – REQUIRES DEVELOPMENT OF STORAGE TO ACHIEVE SOCIAL AND ECONOMIC EQUITY, TAKING INTO ACCOUNT THE ENVIRONMENT.**
- **BUILD BETTER UNDERSTANDING OF THE SOCIO-ECOLOGIC SYSTEM IN TROPICAL AREAS.**

OUTLOOK - RESEARCH

Complex socio-ecological systems:

- ***Are better managed using a continuous learning and adaptive process, public participation and integration of scientific knowledge across disciplines but also between experts.***

- ***In this context the key issues that arise for the future are:***
  - ***What are the critical mental models, decision paths and nodes of these systems***
  - ***How can we use them to improve co-directed adaptive trade-offs between fairness, efficiency and sustainability?***

GAPES IN CURRENT REASERCH

- **The social dimension of water. Stakeholder interests and participation of the public;**
- **Economic dimension of Water. economic valuation of water, the economic impacts of floods and droughts, water demand management instruments, price setting, irrigation water policies, and others;**
- **Groundwater knowledge and exploitation strategy;**
- **Water quality and pollution of water resources;**
- **Technologies for the use of water.**

Juizo & Lamoree, 2010

THANK YOU