

# SA WATER SITUATION: NPC PERSPECTIVE

Commissioner  
DKP Sechemane

31 August 2016



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- **Way Forward**



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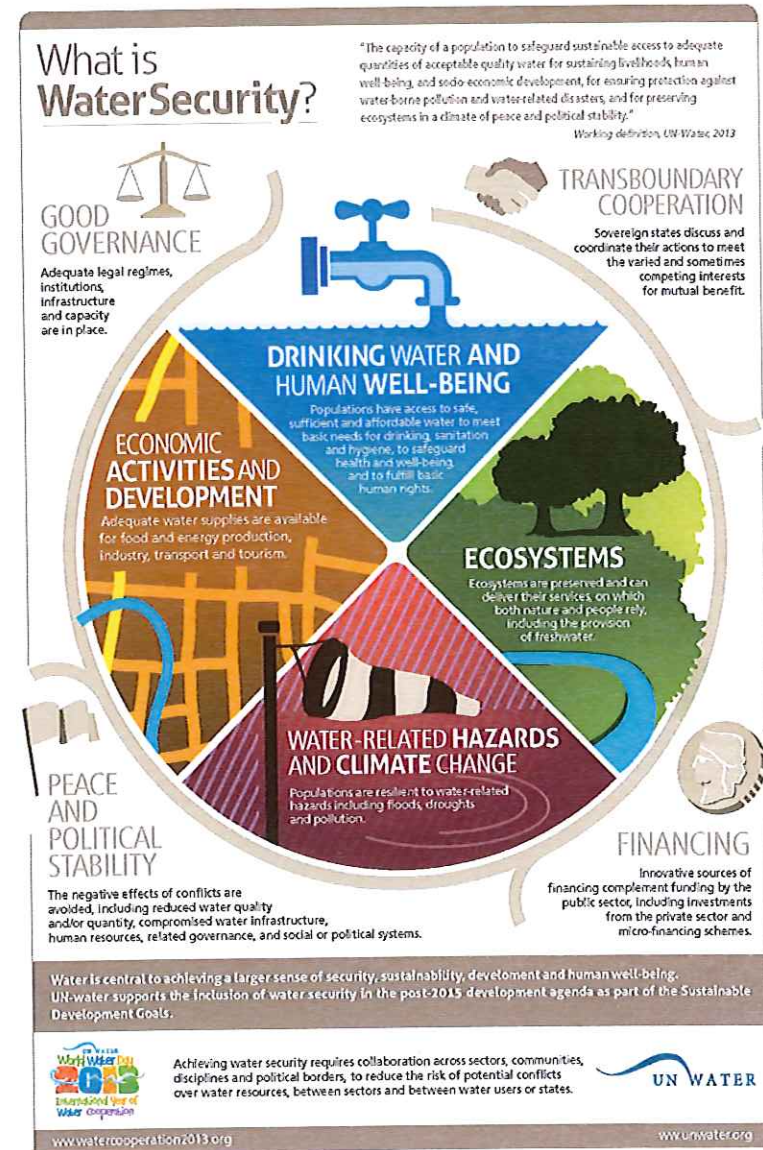
# What is Water Security

**“the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability”**

UN-Water



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# What is Water Security....(2)

Six key thematic areas that are seen as critical for water security (Water diagnostic report Oct 2015):

- the water demand and supply situation;
- impact of climate change;
- infrastructure asset management and functionality;
- infrastructure planning and development;
- institutional and regulatory framework; and
- human and institutional capacity



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# What is Water Security....(3)

Three factors that determine water security (Grey and Sadoff, 2007):

- The **hydrologic environment** –
  - which for the purpose of this document could be referred to as the biogeophysical environment mainly natural legacy inherited by society
- **Socio-economic environment** –
  - economic structure and the associated behaviour of its actors which reflect natural and cultural legacies and policy choices. In South African context this includes the legacy of inequalities resulting from decades of discriminatory policies and the resultant inequality, and the need for redress.
- The **future environment** –
  - inclusive of global change, and climate change and adaptation.

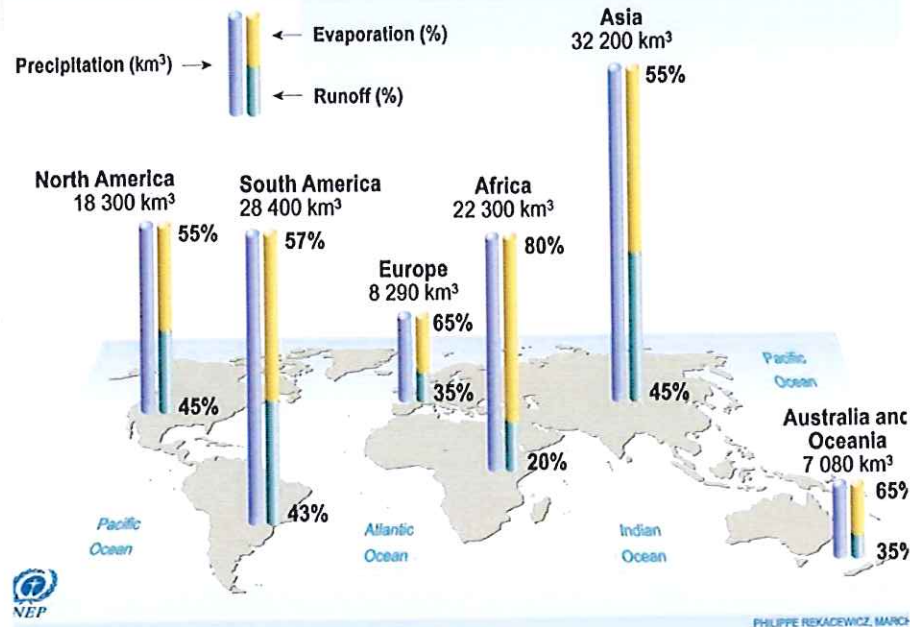


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# GLOBAL OVERVIEW

## The World's Surface Water Precipitation, Evaporation and Runoff by Region



### Message 1:

Africa is a **resource based economy** continent, with a **low rainfall: runoff ratio** & **high evaporation rate**

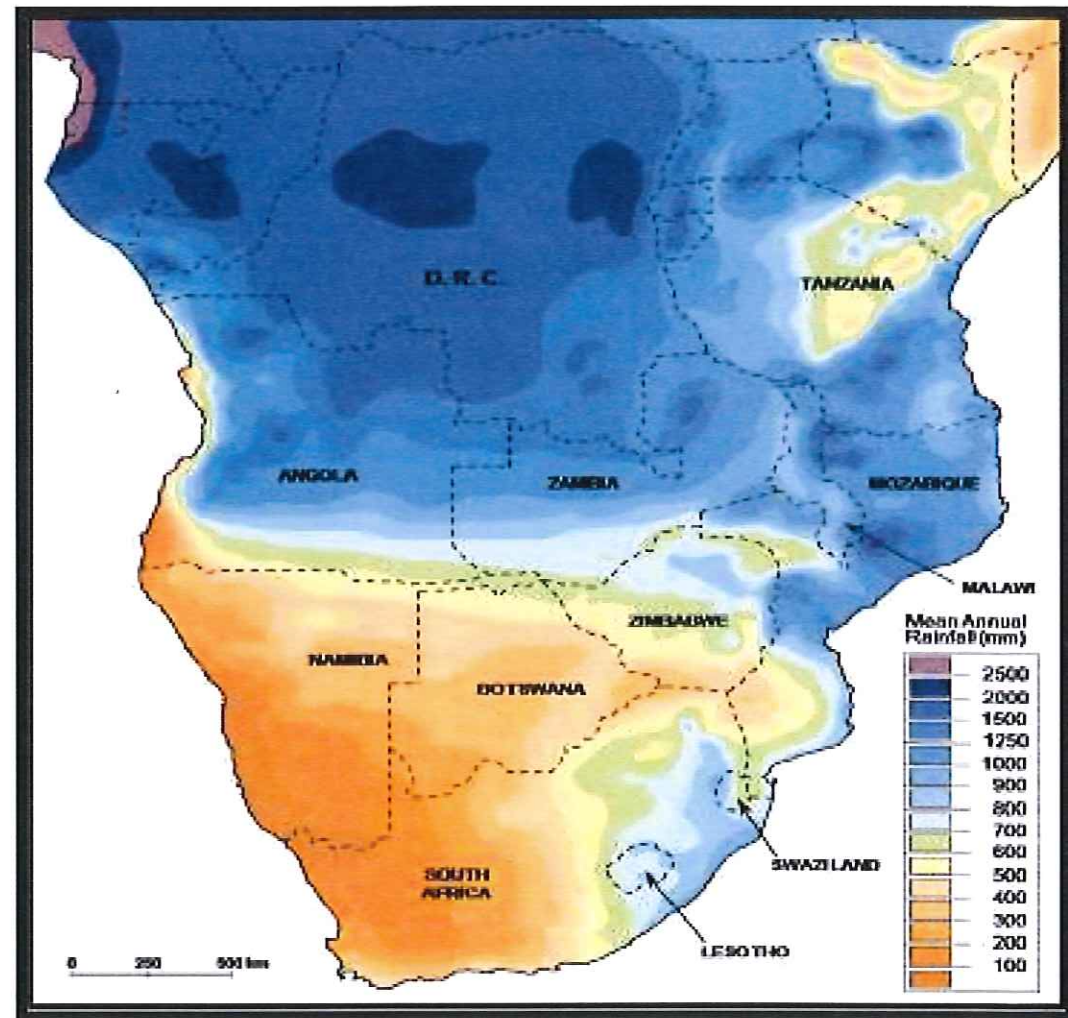


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# REGIONAL OVERVIEW

SADC Mainland  
Mean Annual Rainfall  
distribution reflecting  
variation with driest  
parts being southern  
most parts of SADC.



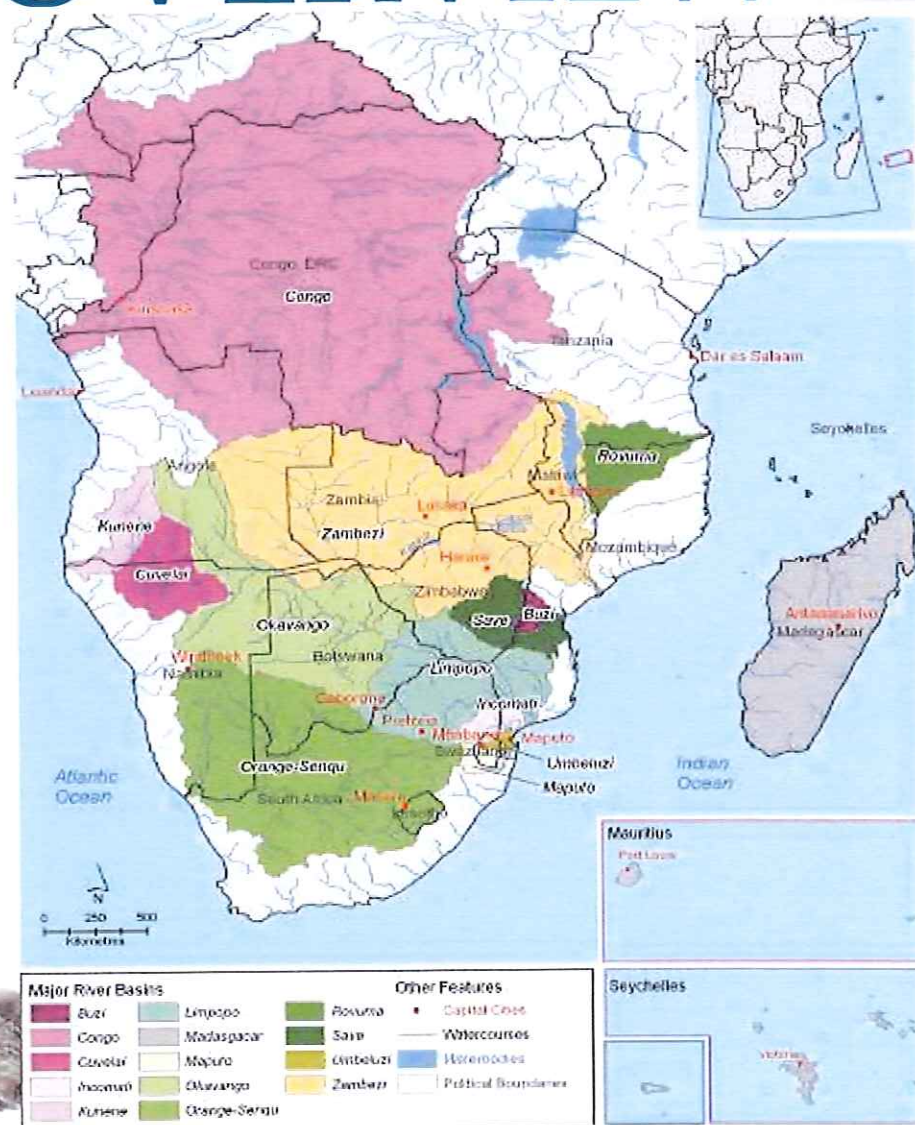
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# REGIONAL OVERVIEW

## SADC political boundaries & major river basins with:

- 15 River basins shared by at least 2 countries
- 70% Rural population relies on groundwater supplies
- **Of 280 million people, 40% has no access to adequate safe drinking water & 60% has access to adequate sanitation services**
- Of 50 million ha irrigable hectares, **only 7% (3.4 million ha); is currently irrigated**
- **14 % of total annual renewable water resources utilised vs. 70-90 % in industrialised countries**



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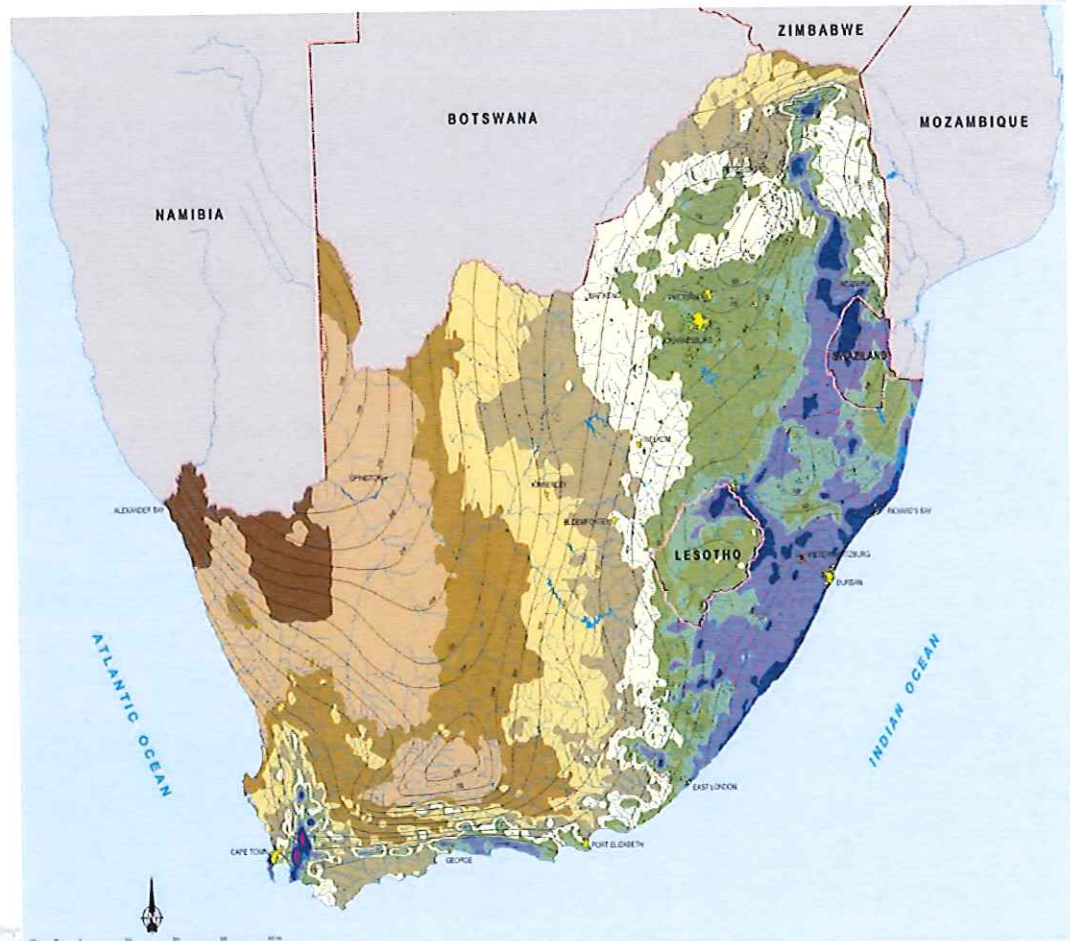
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# SA WATER OVERVIEW

## Water Availability - National Rainfall and Evaporation:

- Uneven spatial distribution & seasonality of rainfall – 43% of rain falls on 13% of land
- Unreliable and fluctuating stream flow for use
- Total natural runoff averages 50 billion m<sup>3</sup> p.a.
- Major urban and industrial development areas not located in areas with water resources – necessitating large scale transfers
- Of the 50 billion m<sup>3</sup>, only 14 billion m<sup>3</sup> (28%) is available for use through dams, basin transfers & other resource developments throughout the country.



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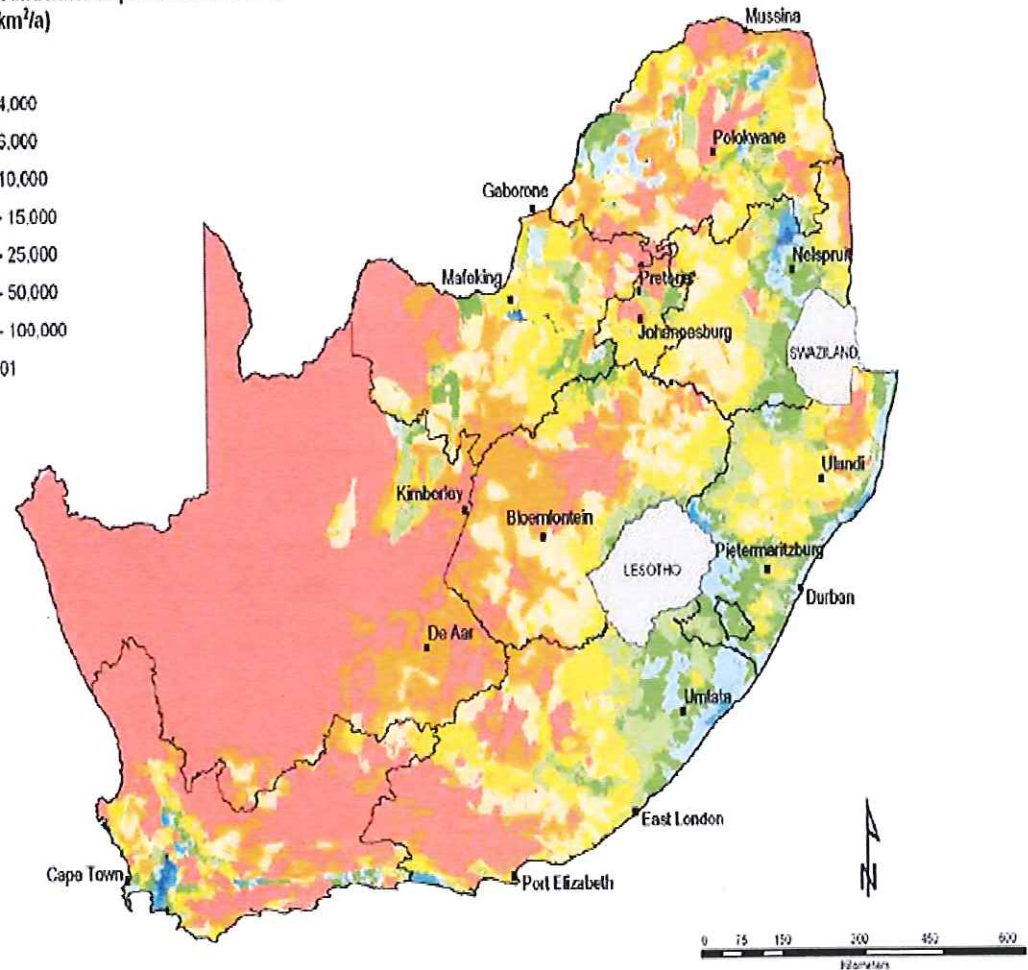
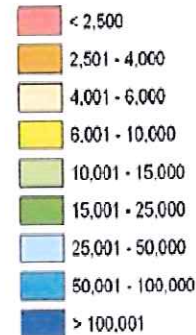
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# SA WATER OVERVIEW

## Water Availability - National Utilisable Groundwater Exploitation Potential $m^3/km^2/a$ :

- Estimate usable water in  $m^3/a$  is :
  - 12 billion Surface Water (+11 billion allocated)
  - 10 billion Ground water (7.5 billion under drought conditions (only 2-3 billion used))
  - 2 billion Usable return flows
- It is estimated that over 60% of small towns rely on groundwater; and
- Groundwater use can be increased substantively, at least in local supply context

Utilisable Groundwater Exploitation Potential (UGEP) ( $m^3/km^2/a$ )



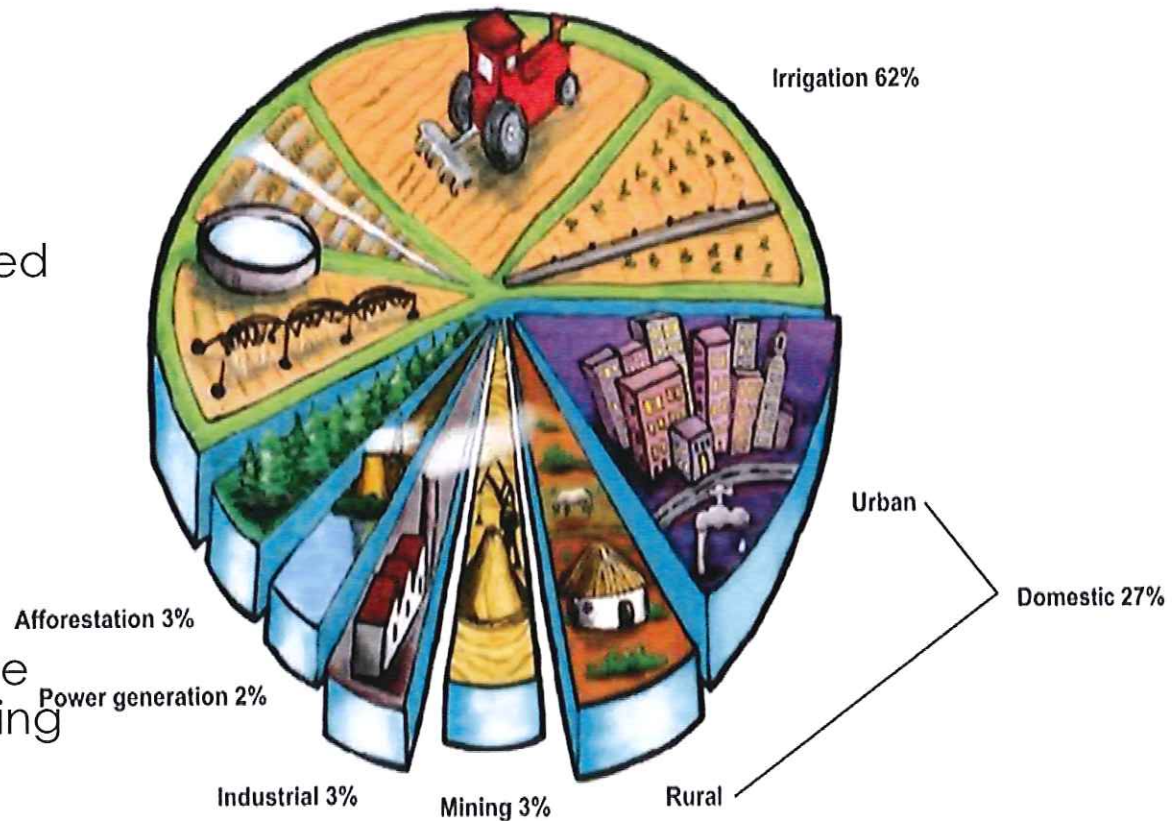
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# SA WATER OVERVIEW

## Water Allocation 6 key sectors:

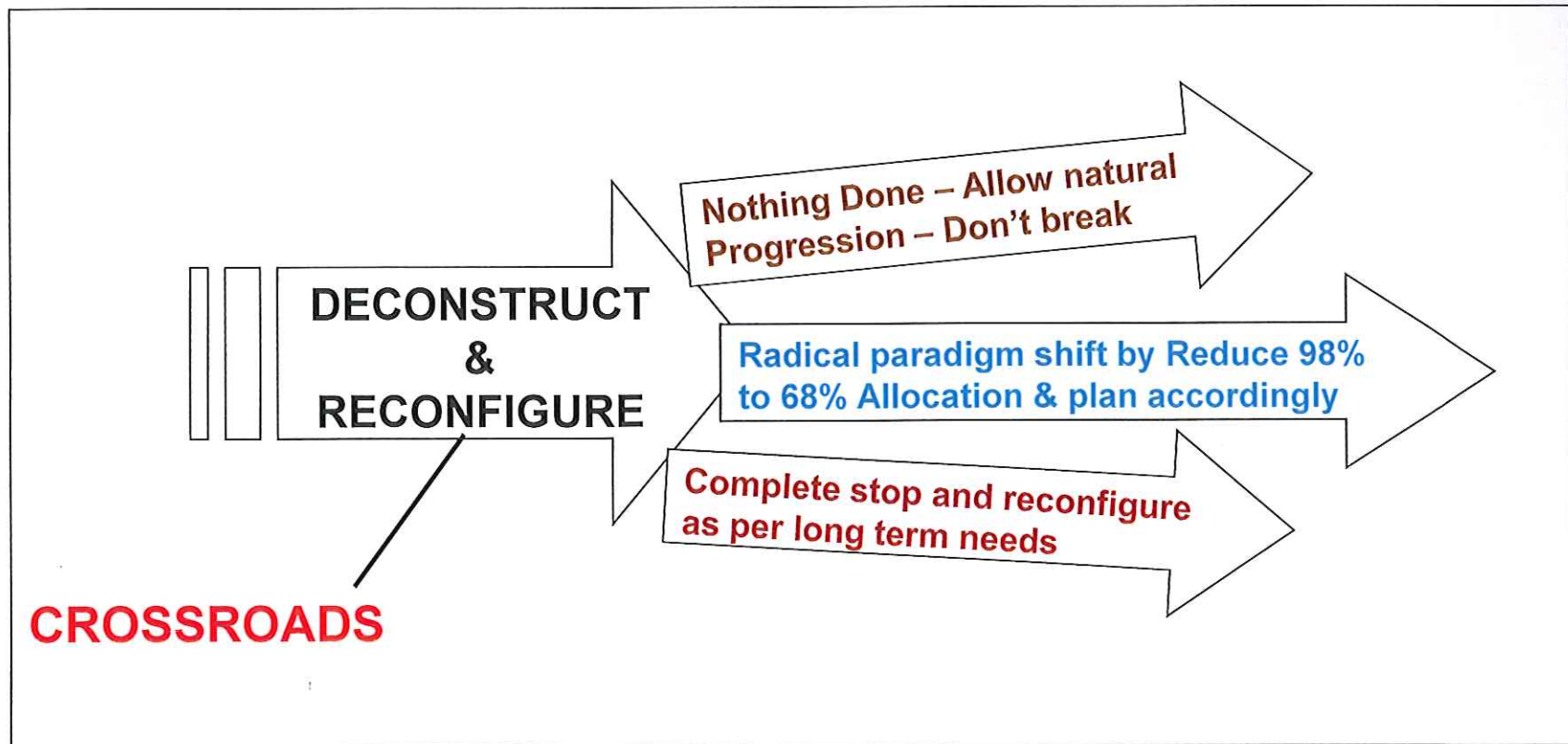
- Only a small proportion can be recycled – 35%
- Measurements are based on allocation and modelled data
- 62% of the data is unmeasured or not monitored
- Need to cleanup and create better responsive tools to facilitate planning and monitoring
- “New water” is needed but we must also ensure efficient use of current available water – ground & surface



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# NPC POSITION



- The plan at National level must provoke thinking so that the country thinks into the future (2030 at least) and ensure that the here and now is aligned at all time.
- Urgent attention to the deconstruction and reconfiguration of models upon which analyses have been based

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# NPC POSITION.....(2)

- Redefining the end state for this sector with a radical view to address the spatial equity and
- examine why there are gaps between the intent of policy and legislation on one hand and the implementation on the other.
- Systems & processes must be compatible with the goals. Specifically the following need to be revisited:
  - Poor quality, quantity and relevance of data
  - Poor regulation and enforcement thereof
  - Reform & transformation of water institutions not fully implemented
  - Lack of integration and common goals
  - Lack of accountability and unclear roles and responsibilities.
  - Sufficient legislation, but poor implementation and lack of decision making



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# NPC POSITION.....(3)

- the plan must focus on National priorities, which include meeting the Sustainable Development Goals (SDGs) as well . These priorities are underpinned by a thriving economy and international obligations in terms of the Africa developmental agenda.
- the plan's building blocks emanate from local, regional, provincial and national needs and imperatives.
- integration will provide high level direction and further demand accountability from all spheres of Government for the implementation of this plan.
- The plan be simplified and properly timed in order to track down progress and identify areas needing national intervention in order to achieve national objectives.



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# NPC POSITION.....(4a)

## Overall Approach:

- **Intergrated and mass balance in nature**

- Consider all the competing water requirements from all sectors, look into input water from neighbouring states (surface water through shared basins) and rain precipitation (hydro-meteorological information necessary), sea water (desalinated for potable or industrial use)
- look at output in the form of evaporation, exit to neighbouring states, and consumptive use of water (irrigation without runoff), non-consumptive; and
- span beyond the Republic and do risk assessment for security of supply in neighbouring countries like Lesotho, from which bulk of our water comes from. These risk assessments should among others look at the possibility of drought, war, change of governments and other forms of conflicts.
- Spatial planning to break the apartheid geopolitical legacy



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# NPC POSITION.....(4b)

## Overall Approach:.....

- Radical Change:

- Allocations for irrigation use must be reformed and structured to be informed by the quantified livelihoods benefit per volume allocated. From basic services to livelihoods & economic development levels
- Include and not limited to, employment created by revenue from produce, food security and achieved efficient water use index, contribution to GDP.
- The nexus approach should be clearly articulated and implemented noting that **WATER HAS NO SUBSTITUTED** . It is a finite commodity that must be preserved and protected for future generations and must be central and a connector in planning



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# NPC POSITION.....(4c)

## Overall Approach:.....

- **Technological advances:**

- Scarcity of fresh water or water fit for use is driving the world towards innovative technologies which look into more efficient ways or treating water and also reducing pollution of water resources. Desalination of sea water into potable or industrial grade water is common practice in the world where surface water is depleted. These technologies demands huge investment costs together with high level skills sets which the RSA should have.

- **Water governance:**

- We have observed a *fatigue* approach in the recent years. The advent of Local Government legislation made the governance of water services even more competitive.
  - Understanding and alignment of legislation is a critical process that must be undertaken.
  - It should be noted that legislation is one of the critical tools at our disposal for the governance and management of water in the RSA.
  - Legislation should be clear on the allocation of responsibilities and mandates in the water value chain across the water cycle.
  - Of outmost importance is the enforcement of regulation, where accountability is demanded.
- 

# Contours of a National Water Security Plan

*“Let’s not frighten everyone by only focusing on 5-30 billion rand projects in water over a 15-20 year period when we can have financing of smaller water development projects of 25-30 million cubic metres dams at no more than 1-1.5 billion rand to serve a district completed within no more than 4-5 years”*



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# Water Security Plan Contours

## Planning for Water Security

From a systems planning perspective, key components include the following:

- The **natural resource system (NRS) – How much & where**
  - the natural sub-system - streams, rivers, wetlands, lakes and their embankments and bottoms, and groundwater aquifer
  - the infrastructure sub-system - canals, reservoirs, dams, weirs, sluices, wells/boreholes, pumping plants and wastewater treatment plants (including operating rules for elements in this subsystem)
  - the water itself, including its physical, chemical and biological components in and above the soil



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# Water Security Plan Contours

## Planning for Water Security

From a systems planning perspective, key components....

- The **socio-economic system (SES) - Demand**
  - Water use and water related human activities
  - Financing for water development and management
- **Administrative & institutional system (AIS) – Processes, institutional tools or mechanisms:**
  - System of administration, legislation & regulation, including authorities responsible for managing and implementing laws & regulations
  - Water governance in general, including national requirements and international obligations



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# Water Security Plan Contours

## Planning for Water Security

...systems planning perspective, key components....

- **The water and sanitation services**

- Primarily conveyance systems up to tap or utilisation and disposal
- can be seen mainly from socio-economic perspective
  - includes relevant infrastructure aspects.
  - must also be viewed in context of environmental flows, especially in terms of impact on ecosystems generally;

- **Water information and knowledge** -knowledge capital

- integral part of the various elements, especially in view of the interdependency of water with other factors outside the so-called "water box". The South African legislation takes the issue of monitoring and information seriously as evident from the peremptory nature of the Chapter 14 of the National Water Act, 36, of 1998.



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# Water Security Plan Contours

## Principles (1)

- The plan needs to be based on a holistic approach that considers the entire water cycle from **source to sea, and back;** and should put human influence on the water and nutrient cycle (environmental flows) at the centre
- Reflect key elements of “*end-to-end water value chain capture*” that will allow full beneficiation upstream and downstream of any project. Local water management must as a matter of course looked at within the context of socio-economic development and not just from social perspective;
- Intellectual capital associated with full value chain in recognition of the value of the Knowledge Economy. South Africa's capability to leverage this aspect in line with its positioning, especially in respect of infrastructure



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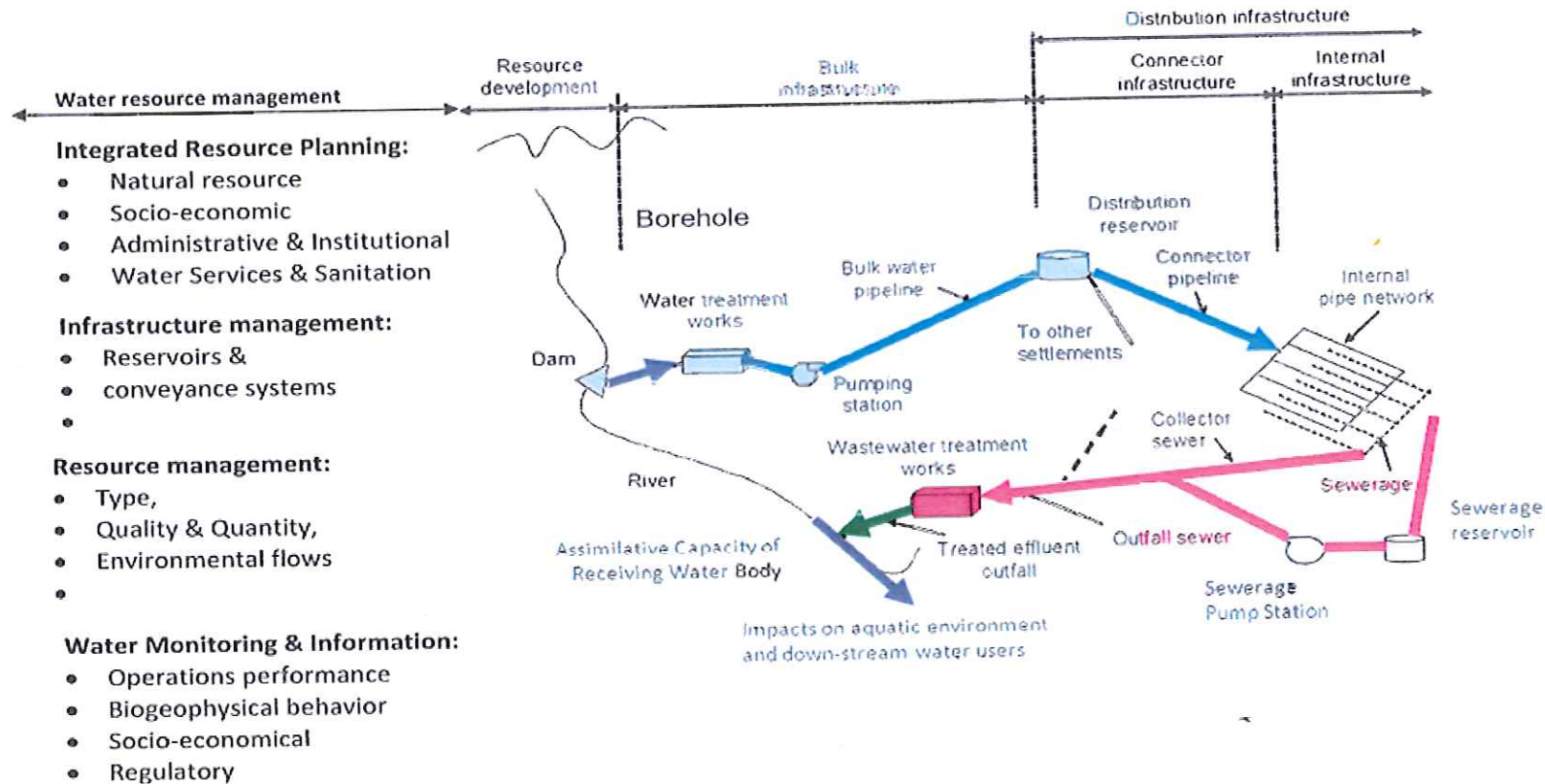
# Water Security Plan Contours

## Principles....(2)

- Institutional framework to be finalized within the shortest possible time so that the policy and legislative regime is properly tested and not defeated or questioned before implemented at least at 60 to 70% level of implementation – concept of progressive realisation.
- Mass balance approach to account for every drop and flow thereof compared to aspirational needs.
- Continuous improvement through identification of risks and bottlenecks and provision of interventions and guidance.
- Decisions must be supported by reliable data and empirical evidence

# Water Security Plan Contours

## Functional Context



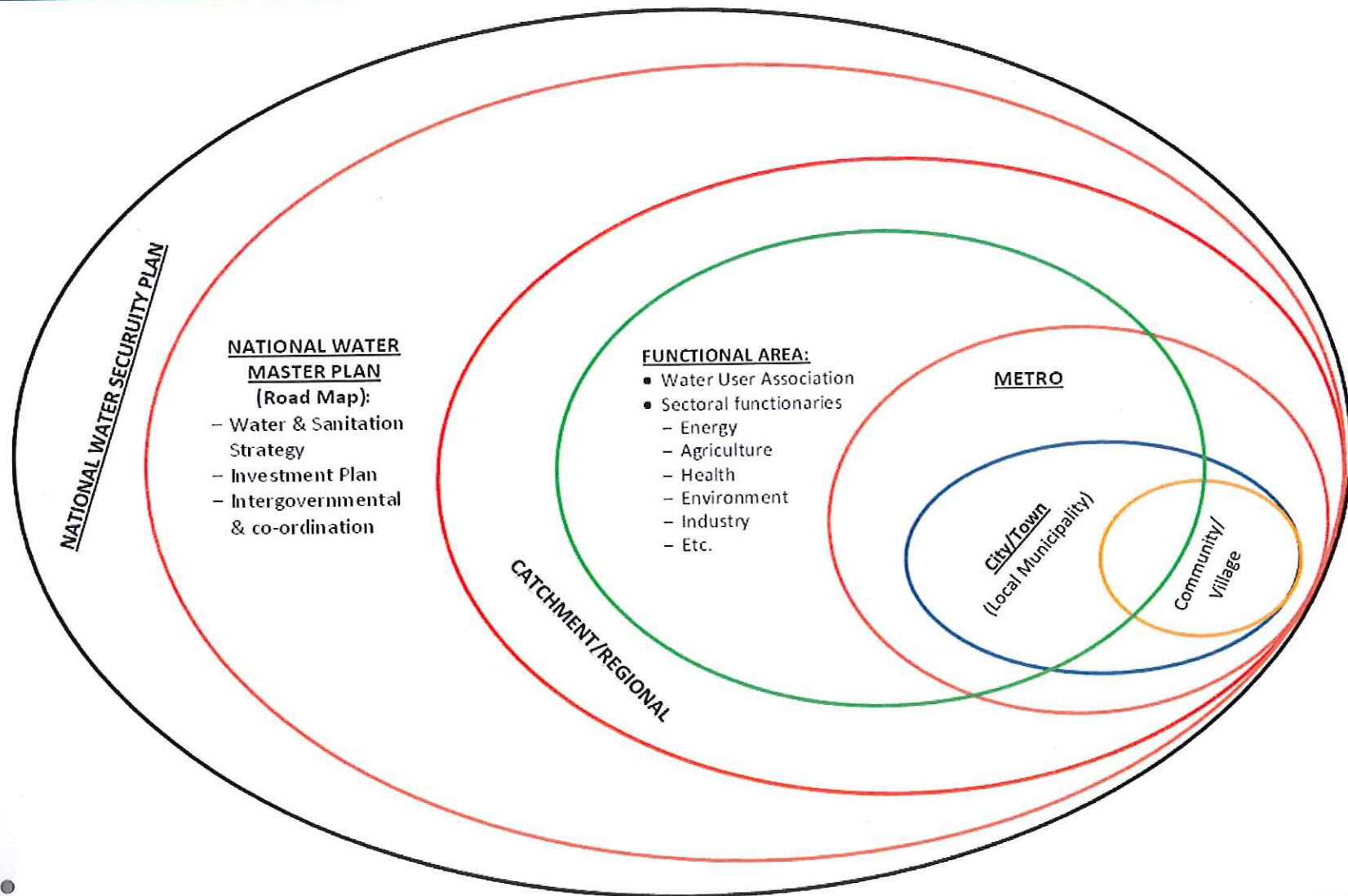
- 98% of Water locked through allocation argument
- Storage designed to address economic spatial zonation

- Conveyance systems (Infrastructure) not designed for "high road"



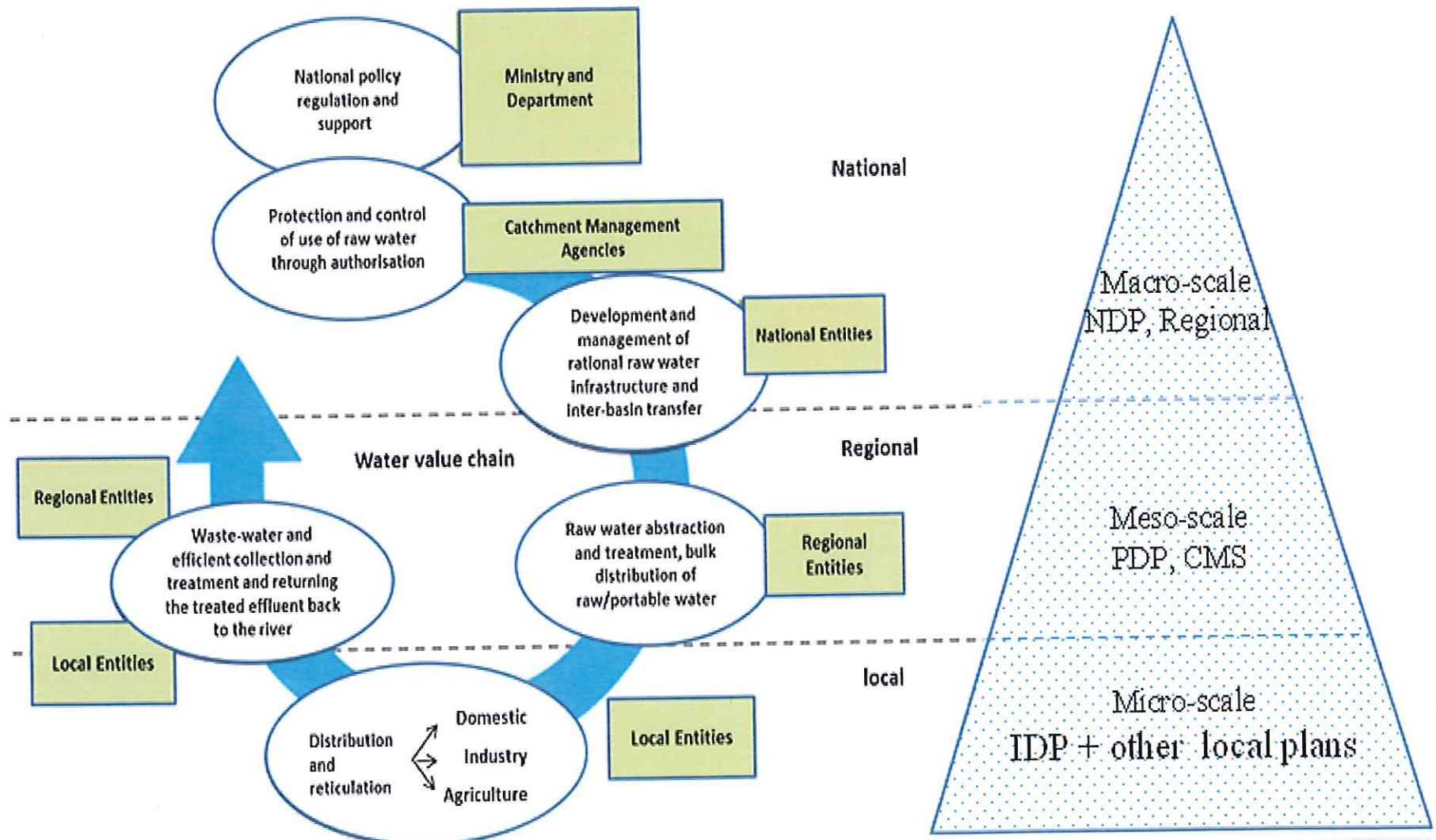
# Water Security Plan Contours

## Institutional Framing

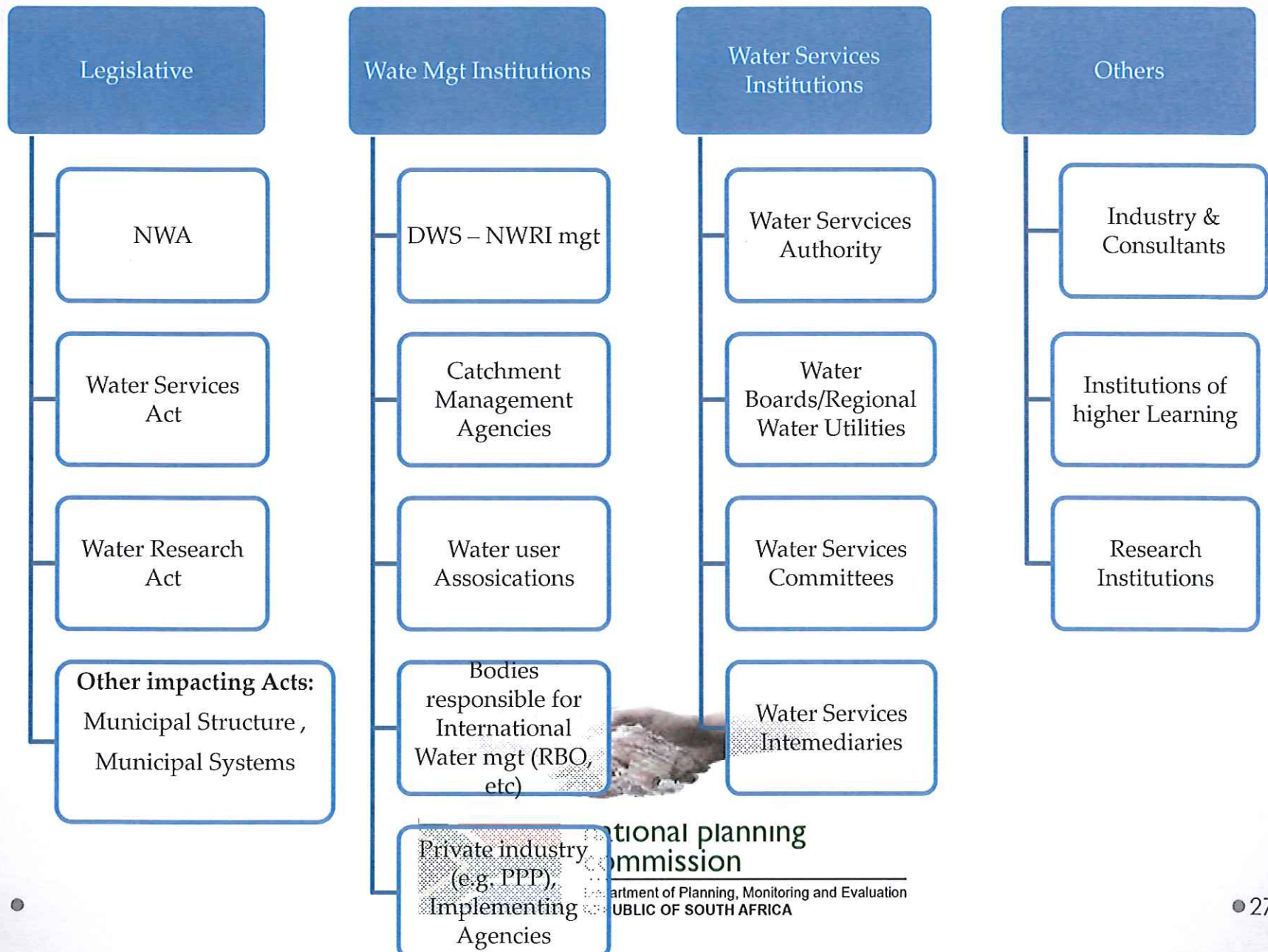


# Water Security Plan Contours

## Institutional Framing



# SA WATER INSTITUTIONS



# SA WATER INSTITUTIONS

Legislative

Water Mgt Inst

Others

## KEY AREAS OF COVERAGE:

- Infrastructure
  - Conditions
  - Availability
  - Reach/Access
  - Financing
  - Operating skills
  - Affordability
- Resilience & Sustainability
- Knowledge Capital & information

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## Other determinants

- Regulatory
- Allocation: Plan/monitor/reallocate
- Authorisation

Industry &  
Consultants

Institutions of  
Higher Learning

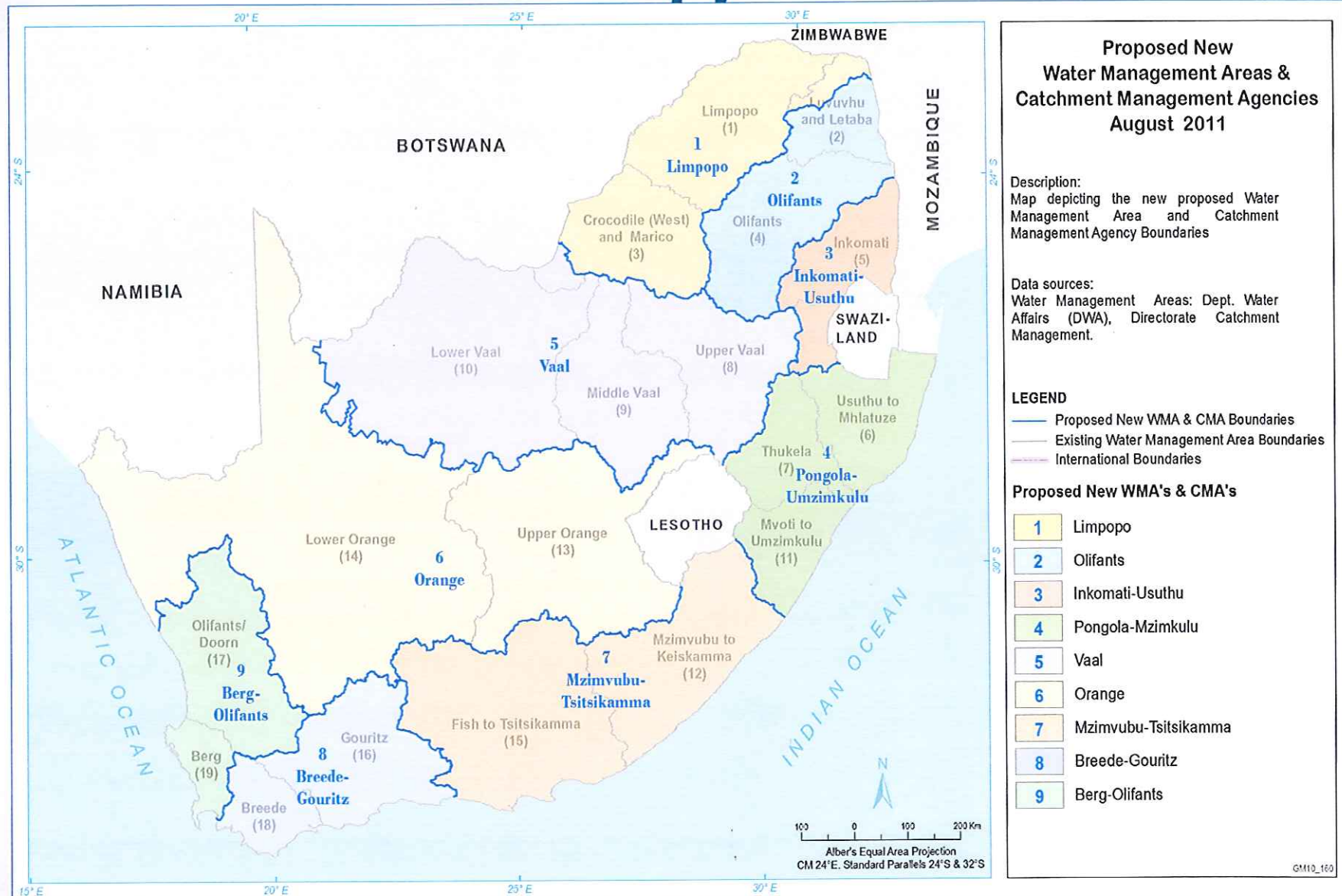
Research  
Centres

Industry  
(e.g. PPP),  
Implementing  
Agencies

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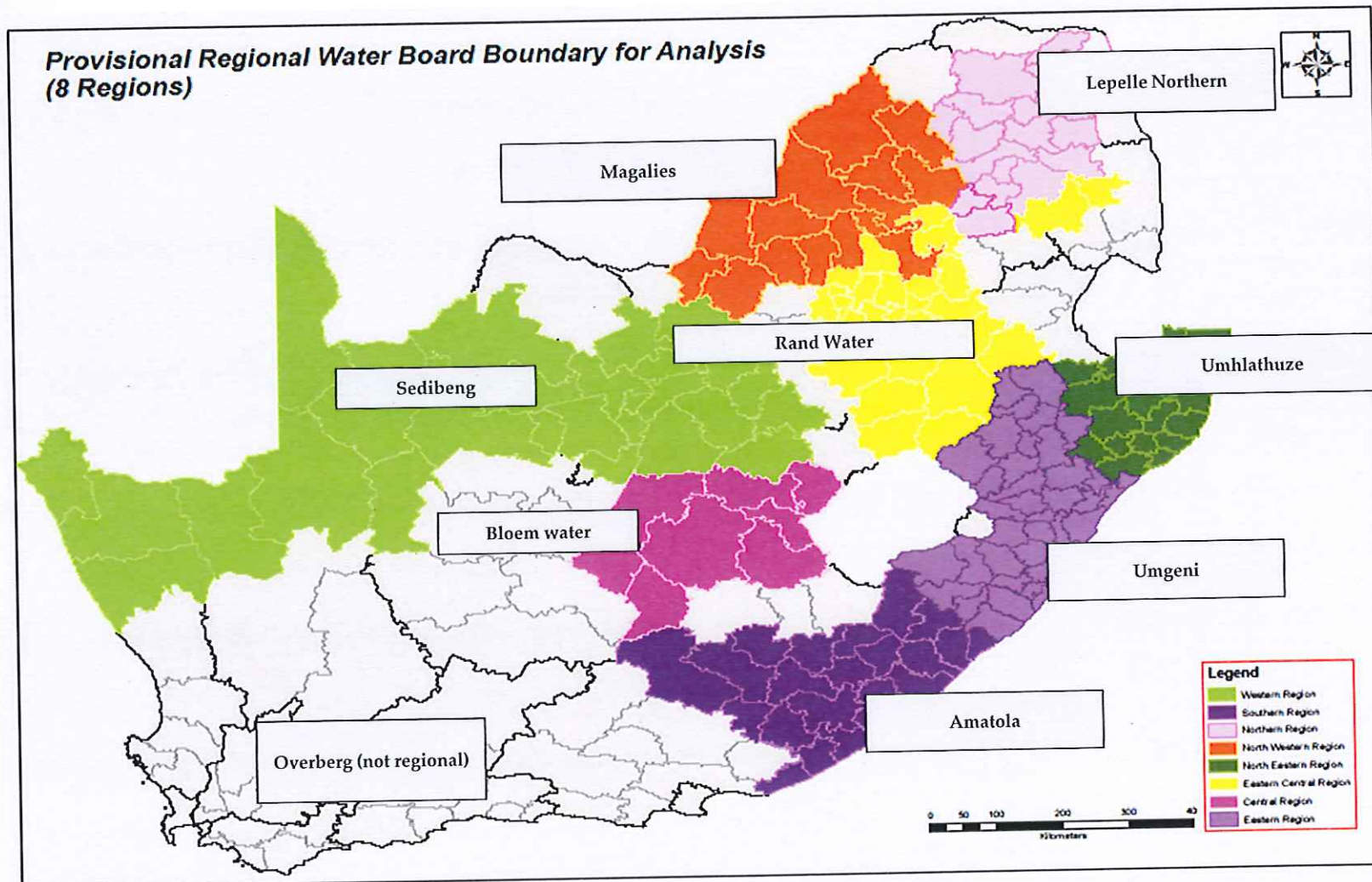
# SA WATER Mgt Institutions



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# SA WATER Mgt Institutions

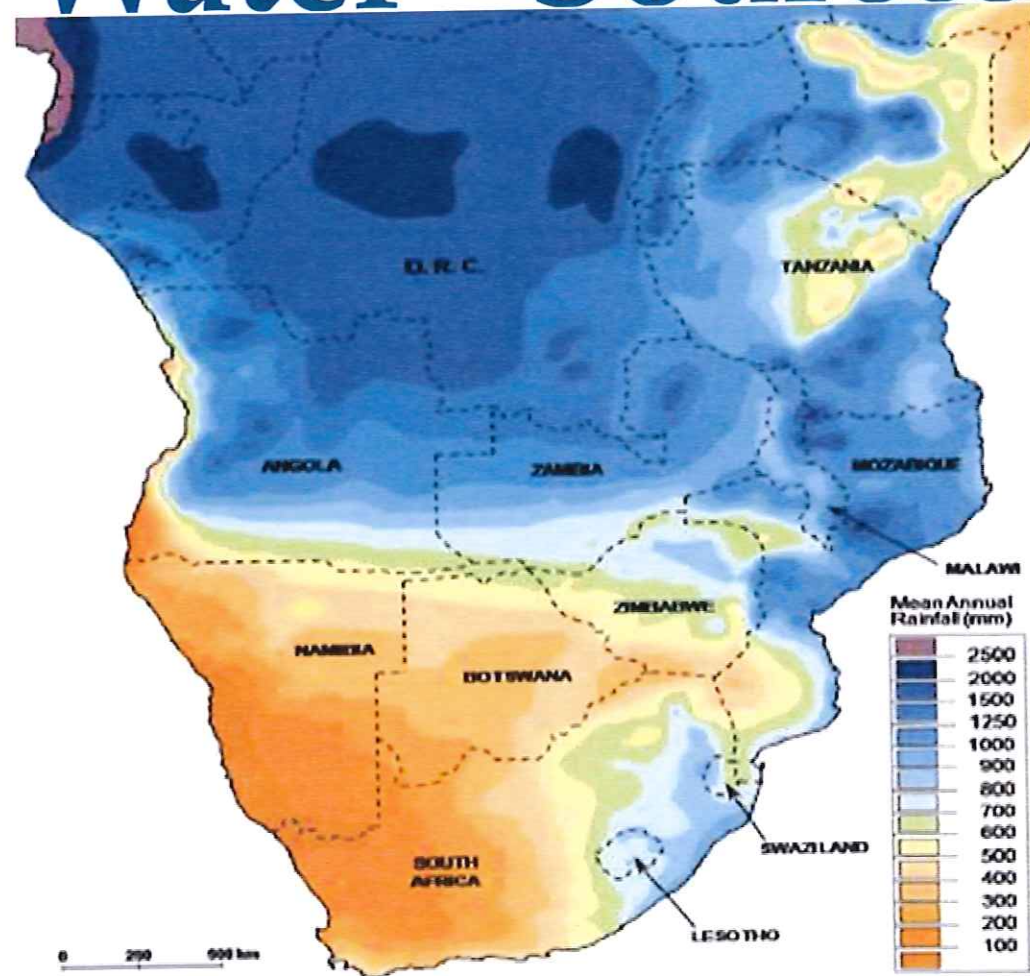


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# How Much Water - Sources

Positioning of SA in SADC context regarding Mean Annual Rainfall showing uneven distribution and variation

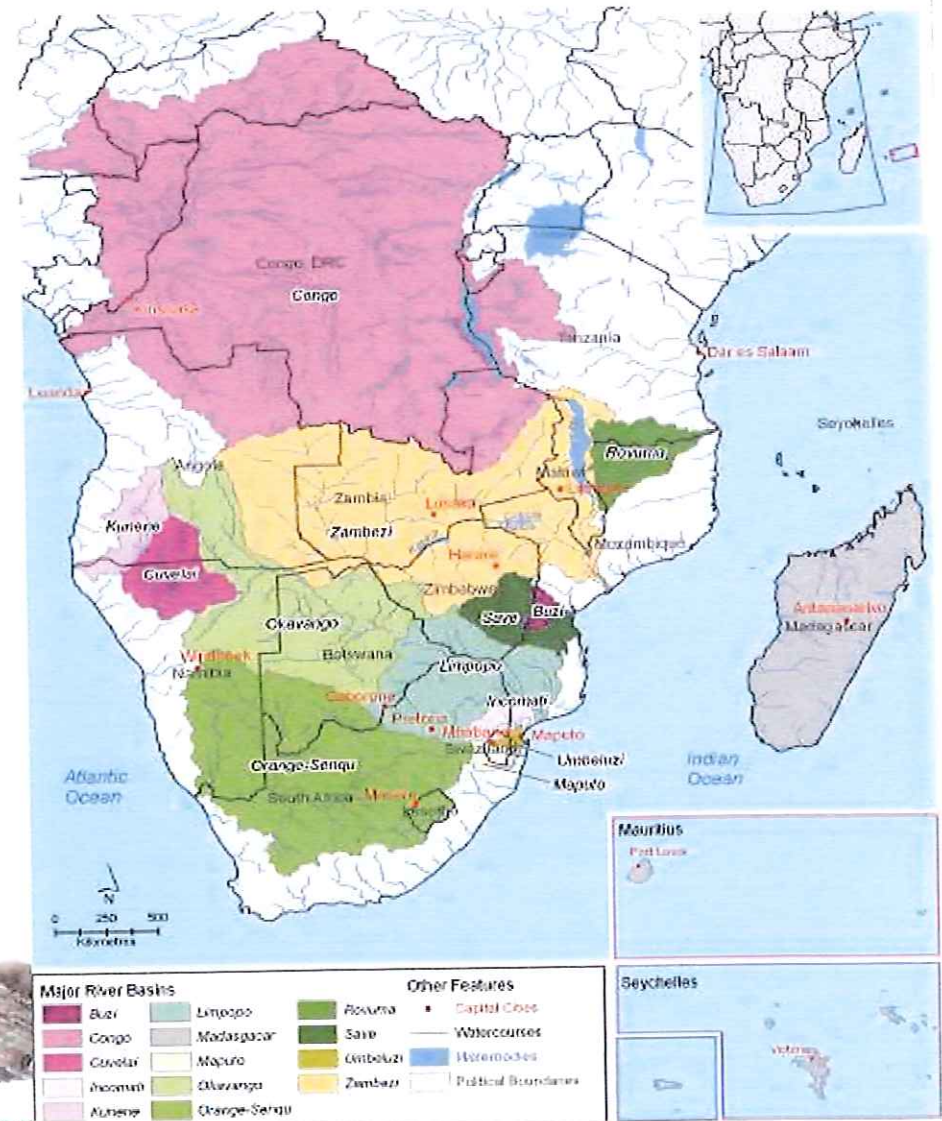


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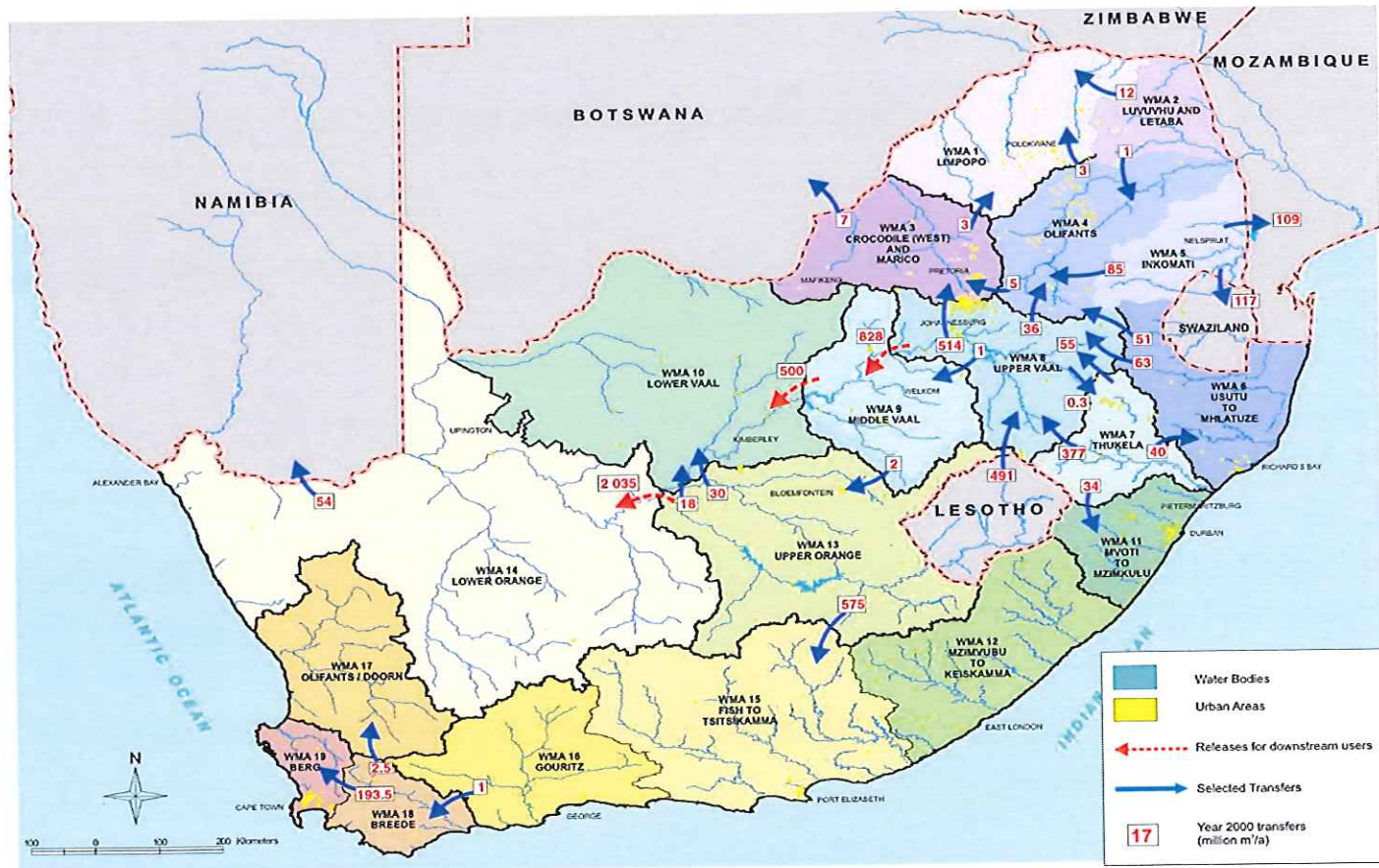
# How Much Water - Sources

- Inter-basin Transfers
- Groundwater
- Sea water – desalination
- Wastewater reuse
- Rainwater harvesting
- Artificial groundwater recharge





# How Much Water - Sources



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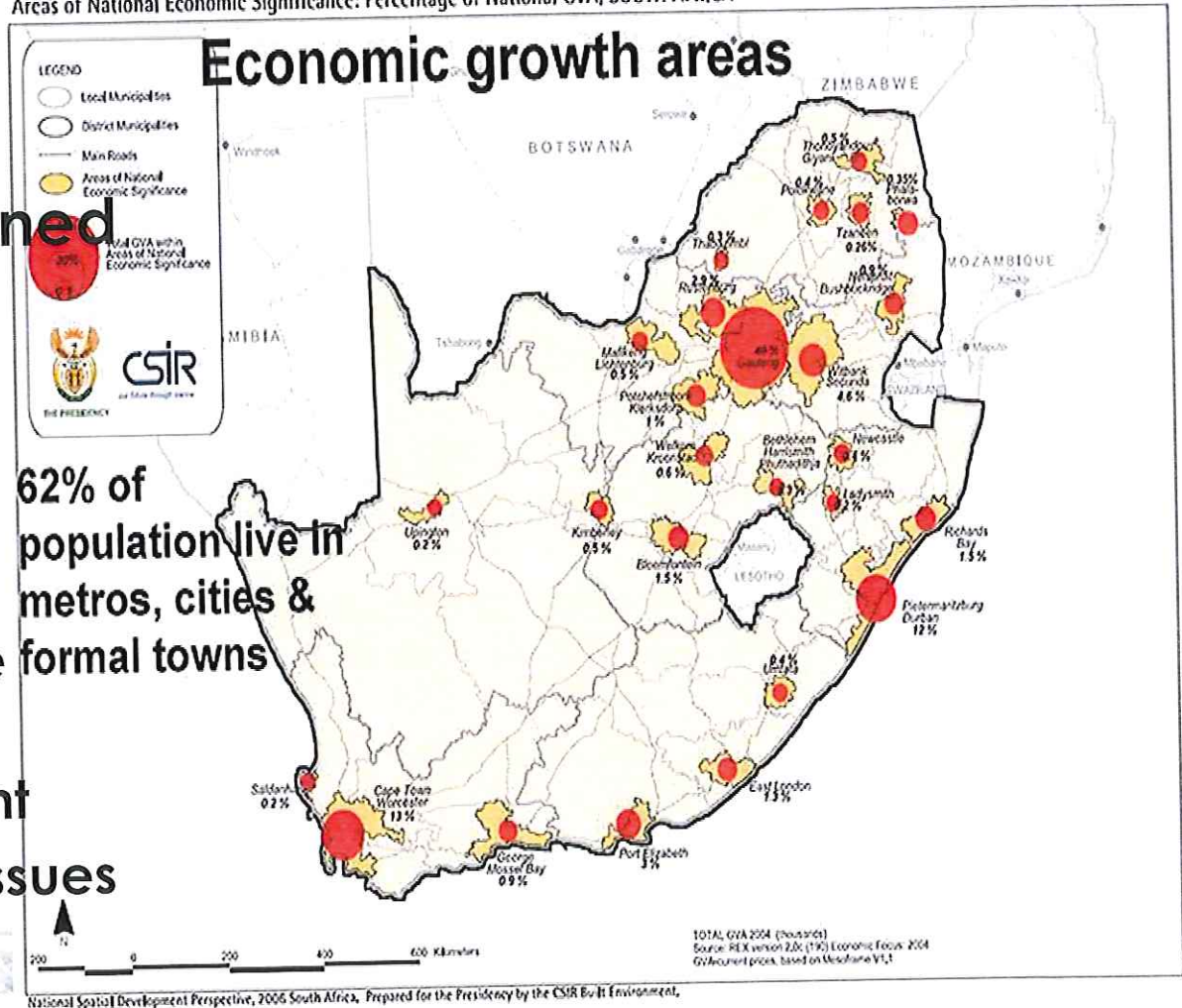
# How Much Water - Demand

NSDP 2006

SA Growth areas & implications for water requirements determined by

- Growth over time
  - 10, 20, 30 40 years...
- Assumptions
- Risks – natural & anthropogenic/climate change
- Geopolitical movement
- Historical institutional issues
- Vulnerability

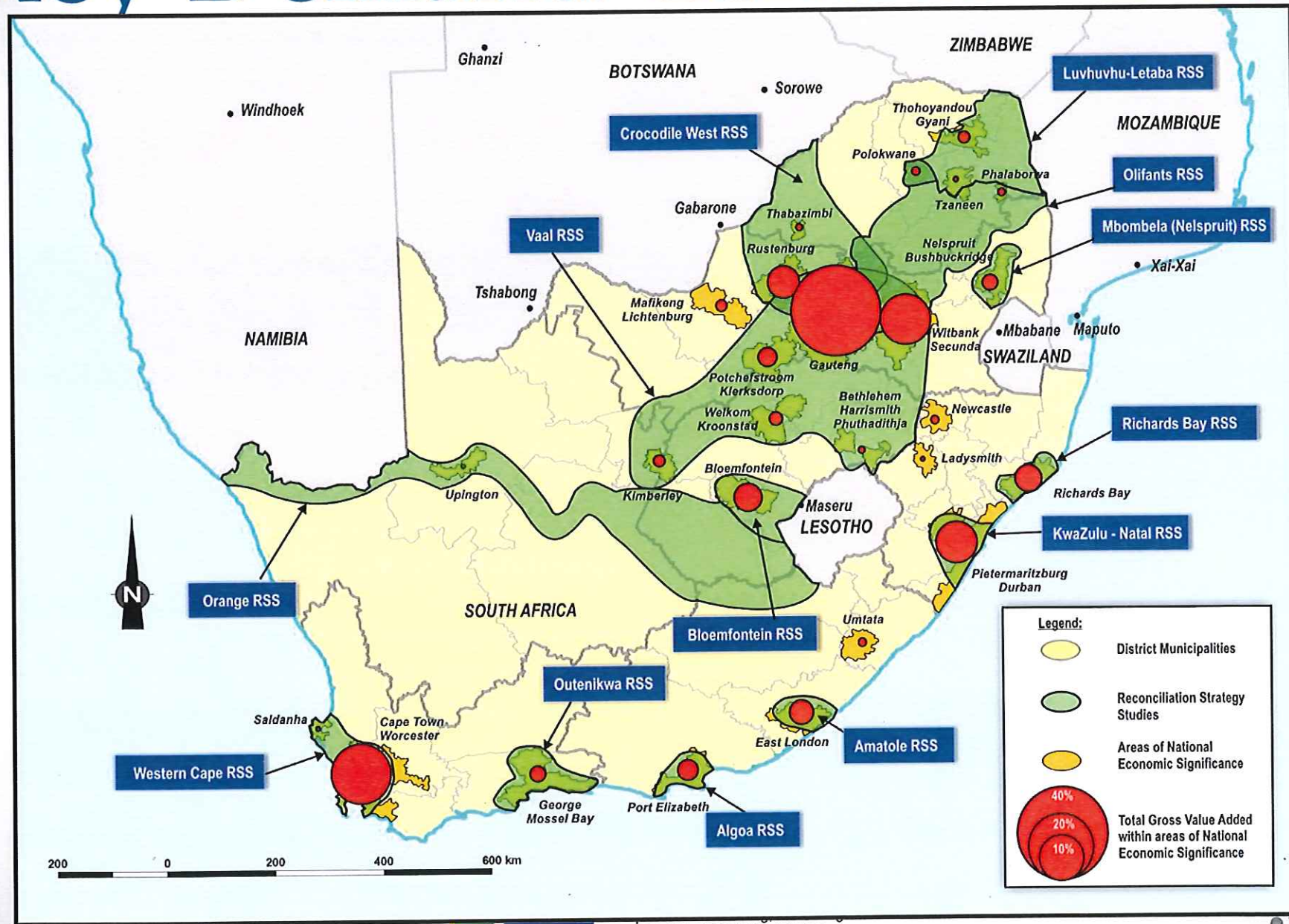
Areas of National Economic Significance: Percentage of National GVA, SOUTH AFRICA



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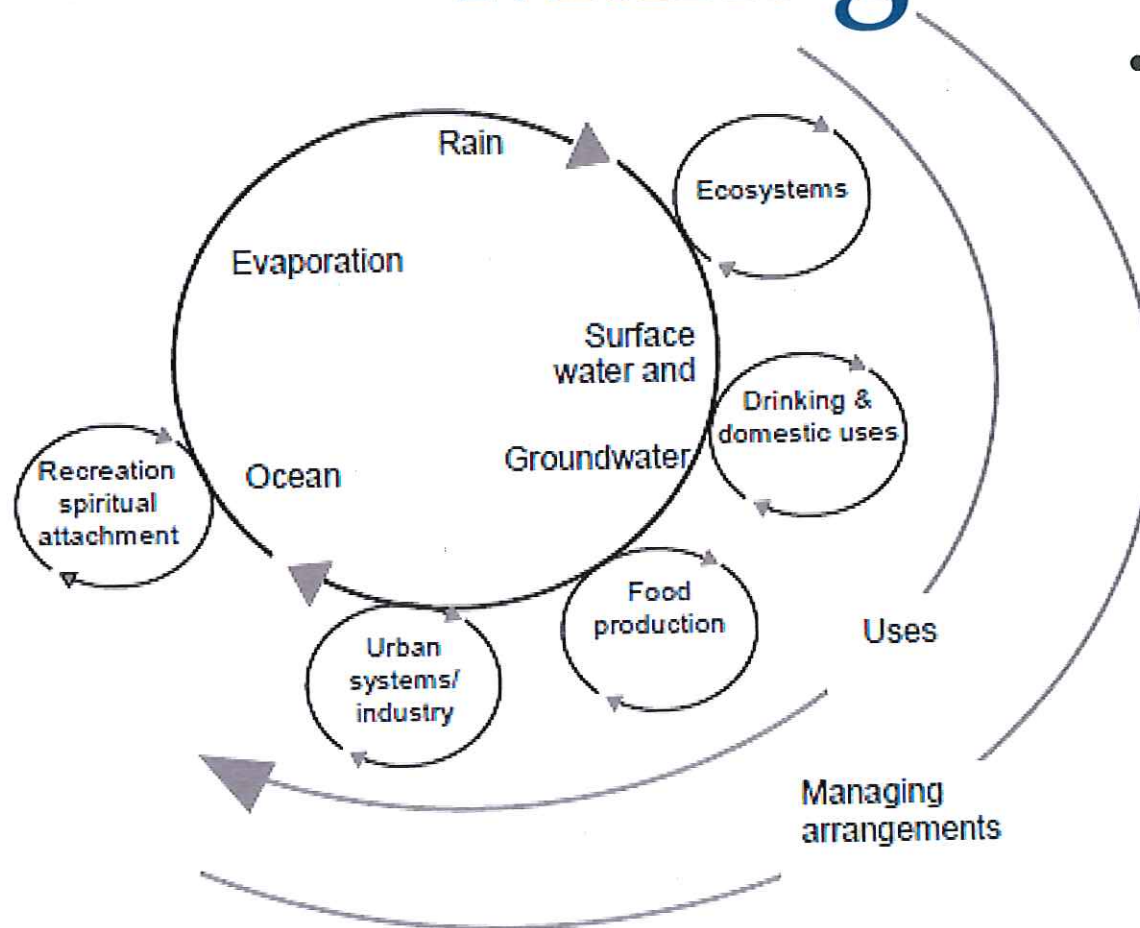
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# Key Demand Centres - DWS



# INTERVENTIONS

## Management



- **Whole Cycle Management:**
  - Supply & Demand Management
  - Environmental flows management
  - Water use sector management
  - Institutional arrangements – local through to national and across sectors
  - Financial flows

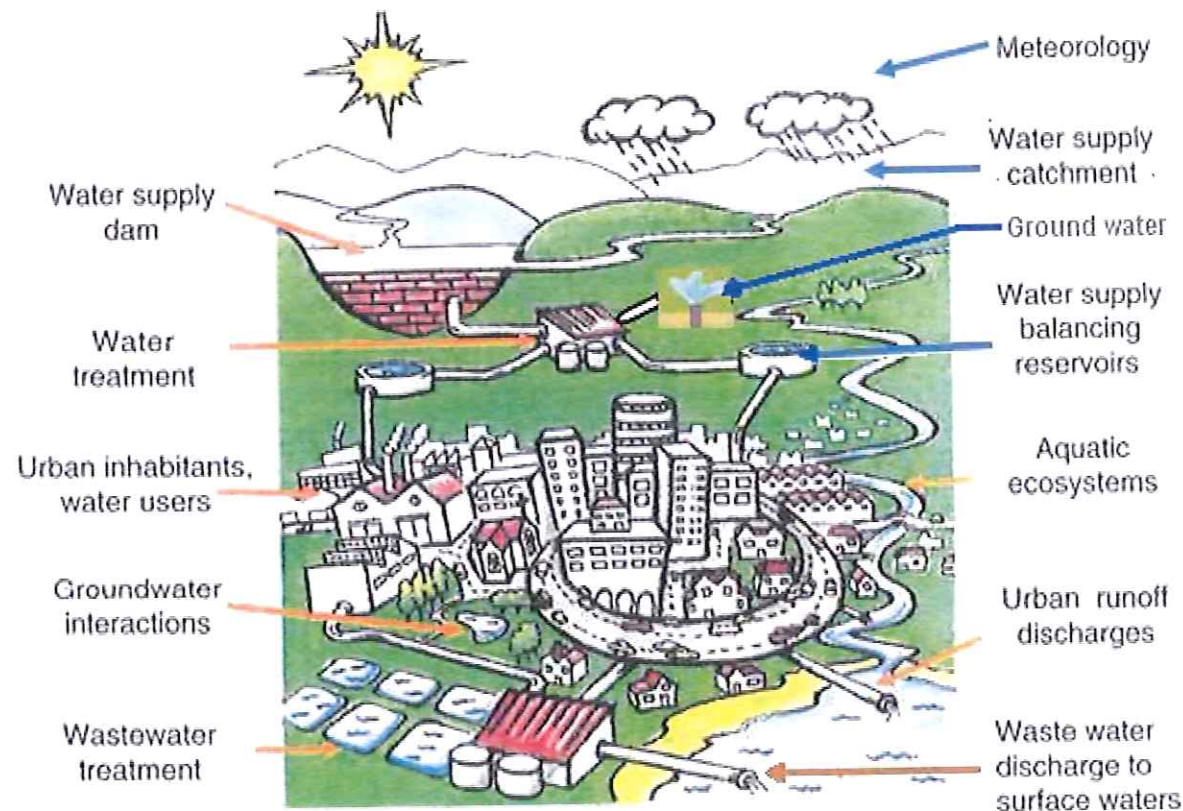


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# INTERVENTIONS

## Management



- **Whole Cycle Management:**

- Management at local level is critical
- Governance issues to facilitate value chain access



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# INTERVENTIONS

- Human Capital development & improved knowledge economy
- Institutional reorganisation for optimal implementation across the value chain
- Conducive & enabling regulatory environment
- Judicious investment in monitoring, assessment and information
- Systems approach to infrastructure development
- Nexus approaches to address growth in demand & climate change:
  - Water-Energy,
  - Water-Energy & Food,
  - Water-Land-Food
- Funding & Financing – flows, instruments & revenue streams



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# WATER SECURITY PLAN

Contents would largely cover six key thematic areas highlighted in the diagnostic report and delineated as critical for water security:

- Situation Assessment, covering at least the following subsystems:
  - **natural resource system**
  - **socio-economic system**
  - **Administrative and institutional system**
  - **Water services & sanitation**
- National Water Security vision
- The water demand and supply situation;
- Global change and adaptation to climate change;
- Strategic infrastructure asset management and functionality;
- Strategic infrastructure planning and development;
- Institutional and regulatory framework
  - Policy framework
  - Governance and implementation
  - Financing & investment
  - Regulatory regime
  - Institutional model
- Human and institutional capacity (incl. intellectual capital contribution to the growth in the knowledge economy)



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# THANK YOU

*“To Measure is to know”*



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