Council for Scientific and Industrial Research (CSIR)

Transboundary Tools for RBOs in SADC Workshop

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Introduction to the Transboundary Waters Opportunity (TWO) Analysis

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Presentation

- **Definition and Objectives of the TWO Analysis**

- **Overview of the TWO matrix: identification of new water sources and development options**

The TWO Analysis

- **A methodology to identify Positive Sum Outcomes, using available data and expert opinion on trans-boundary basins.**

- **The overall aim is to promote the sustainable and equitable use of transboundary water resources, and to clarify trade-offs relating to development.**

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Objectives of the TWO Analysis

- To demonstrate possible alternatives for countries sharing trans-boundary water resources, in exploring development opportunities determined to be PSOs.
- To act as a 'compass' identifying the need for subsequent detailed investigations by riparian countries
- To act as a scenario tool to illustrate longer-term changes and future options in a non-threatening manner.
- To identify opportunities for public and private financiers to support initiatives taken by riparian countries.
- To confirm previously selected development preferences, decided upon prior to the creation of the TWO Analysis technique

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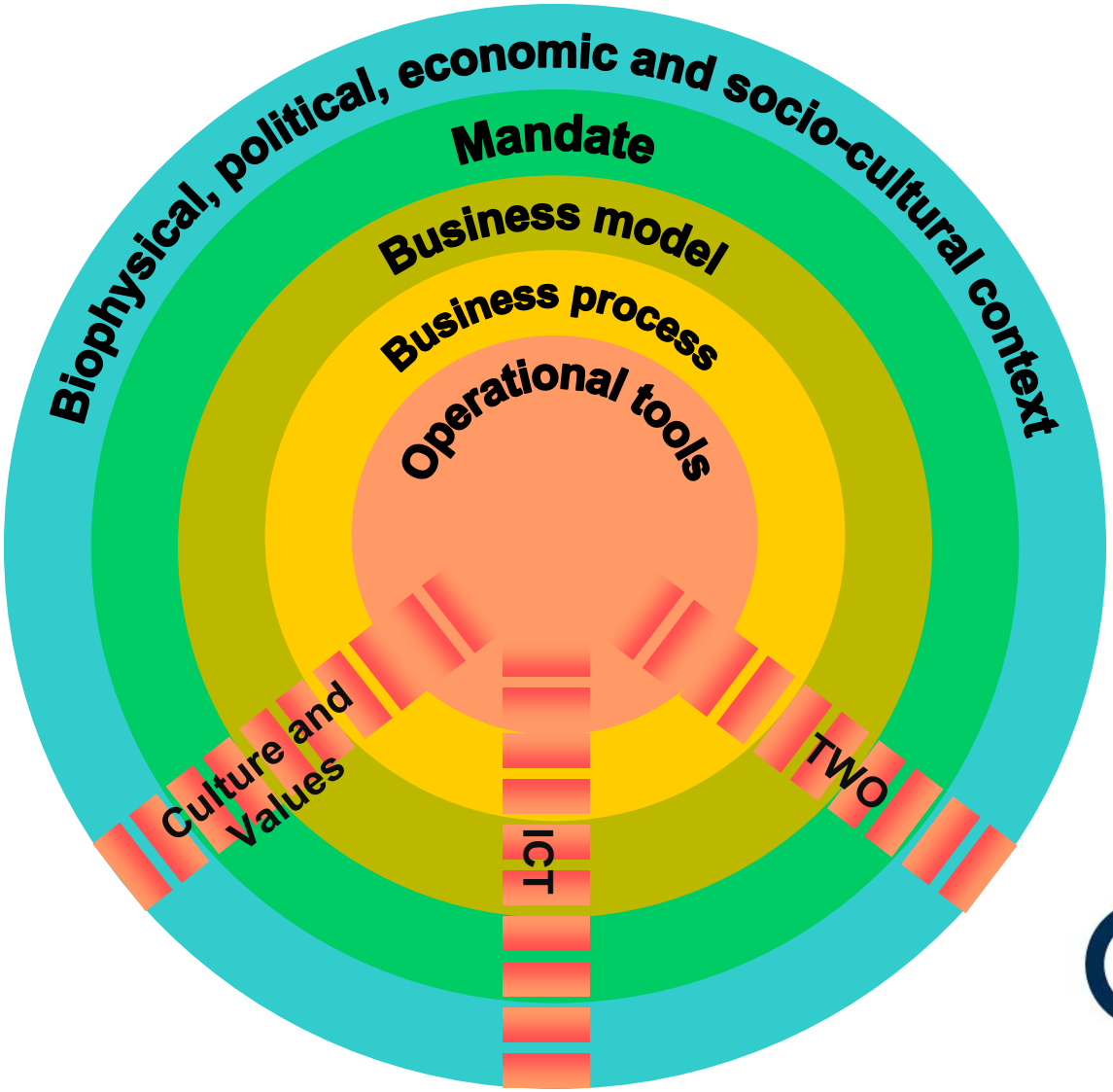
The TWO Analysis- A Strategic Analtyical Tool



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Using Water Wisely: The TWO Analysis

- The TWO Analysis uses two main factors relevant to the hydrological cycle:
  - the availability of 'New Water'; and
  - the efficiency of water utilization.

- Four main categories of development options are used:
  - hydropower potential;
  - primary and secondary production;
  - industrial development and urban growth; and
  - ecosystem services e.g. fisheries and tourism

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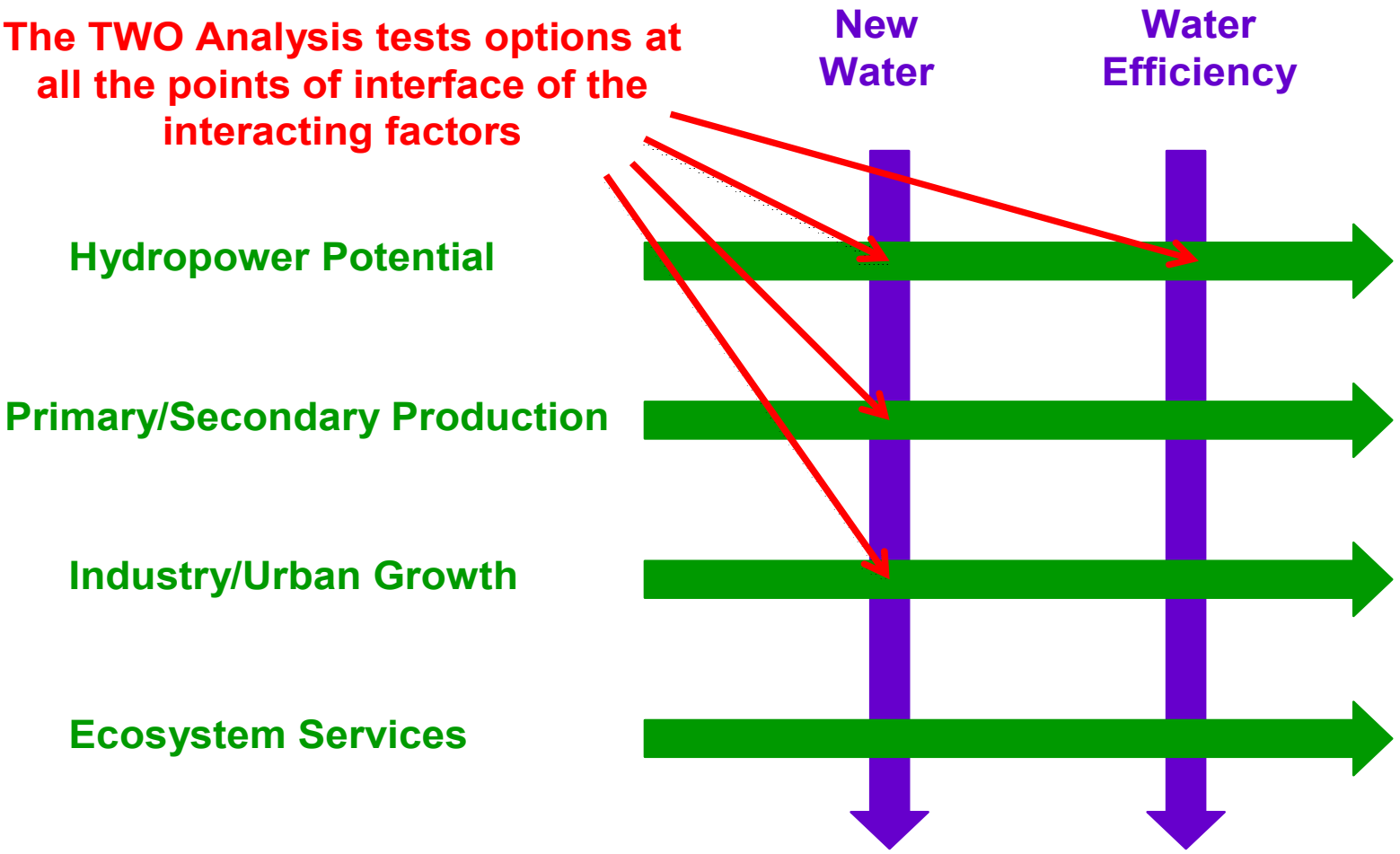
The TWO Analysis Matrix

The TWO Analysis tests options at all the points of interface of the interacting factors



The TWO Analysis: The Water-related Factors

- Studies to date have only very rarely included the hydrocycle as a whole:
  - Blue Water;
  - Green Water;
  - Grey/Black Water.

- The TWO Analysis addresses all of these, and the interactions between them.

- This is critical, if the optimal development options are to be defined.

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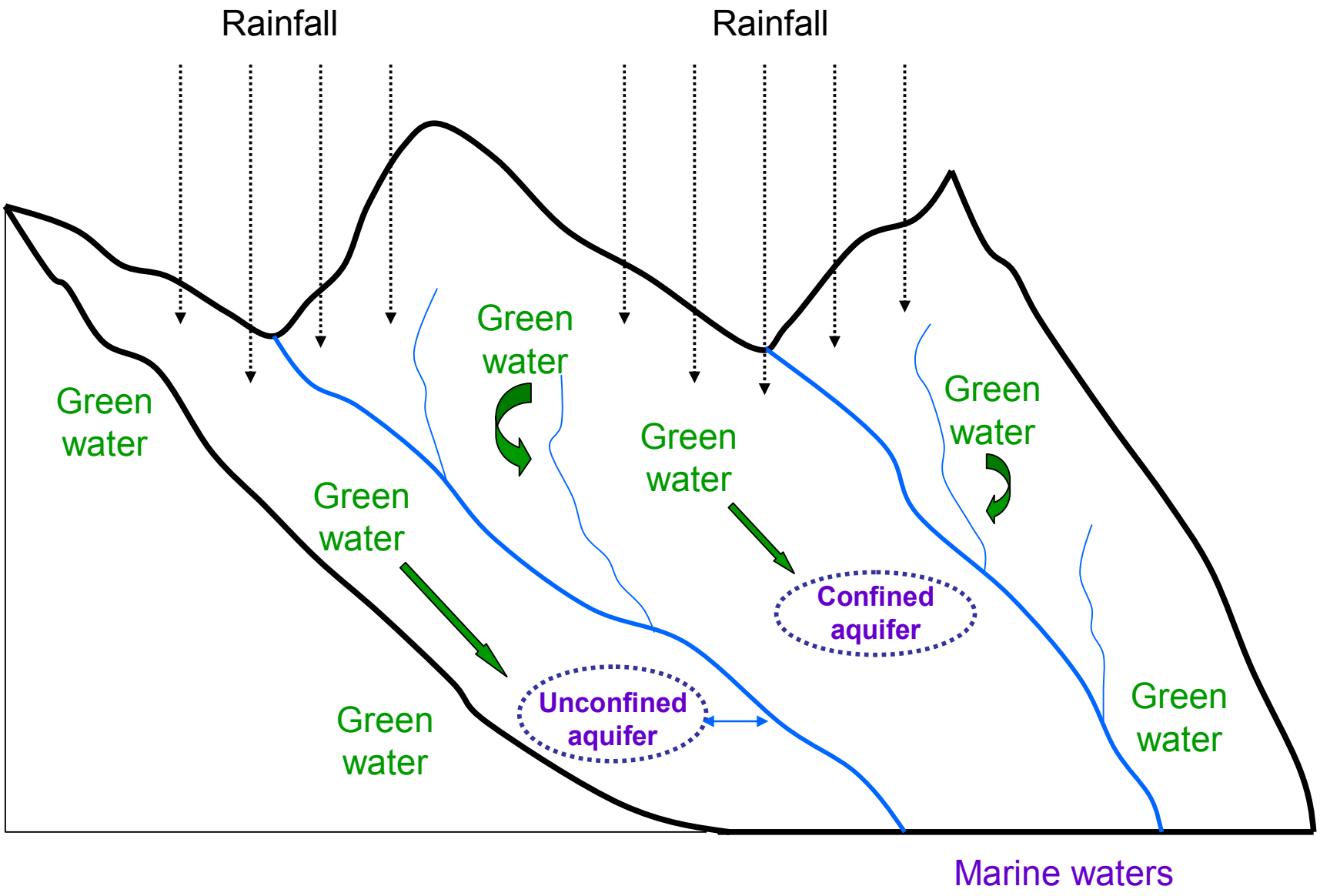
Rainfall
Rainfall
Green water
Green water
Green water
Green water
Green water
Green water
Green water
Confined aquifer
Unconfined aquifer
Marine waters

Sources
[1] New Water

- Fresh water developed through desalination;
- The re-use of wastewater to create New Water
- The release of higher volumes of Blue Water to downstream riparians, due to improved Green Water/Blue Water management in upstream areas; and
- Water derived from either intra-basin or inter-basin transfers.

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Sources
[2] Efficiency of Water Use

- Drip irrigation
- Improved crop selection, reducing requirements for water and including a greater emphasis on the production of cash crops; and
- The economic returns from water use in the industrial sector can also be improved, e.g. by recycling water and minimizing its use in specific applications; and also by shifting to less water-intensive forms of industry with equal or higher economic returns.

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The Development Options: [1] Agriculture

- **Options related to improvements in primary production using Green and Blue Water resources, e.g. in agriculture for food and bio-energy production; and in forestry, where this is of particular importance in developing countries.**

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The Development Options: [3] Urban Growth and Industrial Development

- The potential for an inter-sectoral reallocation of fresh water from uses with low economic returns to applications with higher returns, involving urban growth and industrial development.
- The economic returns from the industrial and services sectors are about 100 times greater than those from Blue Water in the agriculture.
- The inter-sectoral reallocation of fresh water from agriculture to the other sectors therefore offers a massive uplift in benefits.
- However, societal effects must be considered when this is contemplated.

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The Development Options: [4] Ecosystem Services

- Ensuring key environment and ecosystem services for future generations.

- Two specific ecosystem services are included in the TWO Analysis:
  - tourism (including ecotourism) and
  - fisheries (riverine and estuarine/coastal).

- Each of these can be important drivers of economic growth in specific basins, e.g.
  - tourism in southern Africa;
  - fisheries in the Mekong River basin.

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Factors: Development / Categories: Sources	a) New Water	b) Efficient use of water	c) Other sources in basins that are not closed
1. Hydropower and power trading	Location of reservoirs in high altitudes to minimise evaporative losses	Siting of multipurpose dams for e.g. hydropower and irrigation in optimal locations	Additional electricity generation through hydropower schemes and power pooling
2. Primary production	Re-use of treated wastewater for irrigation Interbasin water transfer schemes	Green Water use to increase agricultural outputs Increase efficency in irrigation	Investment in bio-energy crops Introducing aquaculture
3. Urban growth and industrial development	Strengthen institutional management for water allocation to more high value use	Maximising economic returns per unit of water in industry	Recharge of groundwater
4. Environment and ecosystem services	Use of "green credit schemes" through e.g. water purification in wetlands	Optimising economic returns from developing fisheries and tourism sector	Allocate water to restore ecosystems
5. Others (every basin is unique and other opportunites may exist)	Desalinate water for high value use	Drought-proofing through improved land management	Flood protection

Conclusion

- **The TWO Analysis facilitates the creation of a 'shared vision' for the future development of a trans-boundary basin, and the process involved is of a generally non-threatening nature**

- **Broad stakeholder participation is preferred**

Thank you