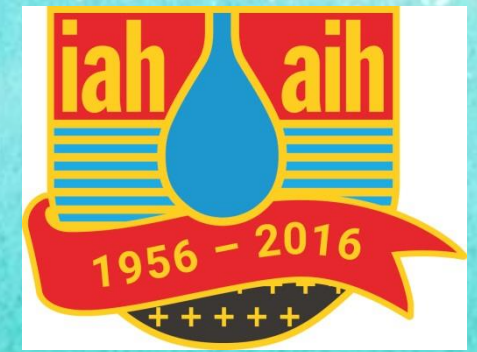




## 43rd IAH CONGRESS

25-29<sup>th</sup> September, 2016

le Corum , Montpellier, France



The transboundary water resources of Lesotho, Swaziland and South Africa- complementarity, consistency, or neither??

**Shammy Puri,**

Fomer, Secretary General, International Association of Hydrogeologists  
Chair, IAH Commission on Transboundary Aquifers



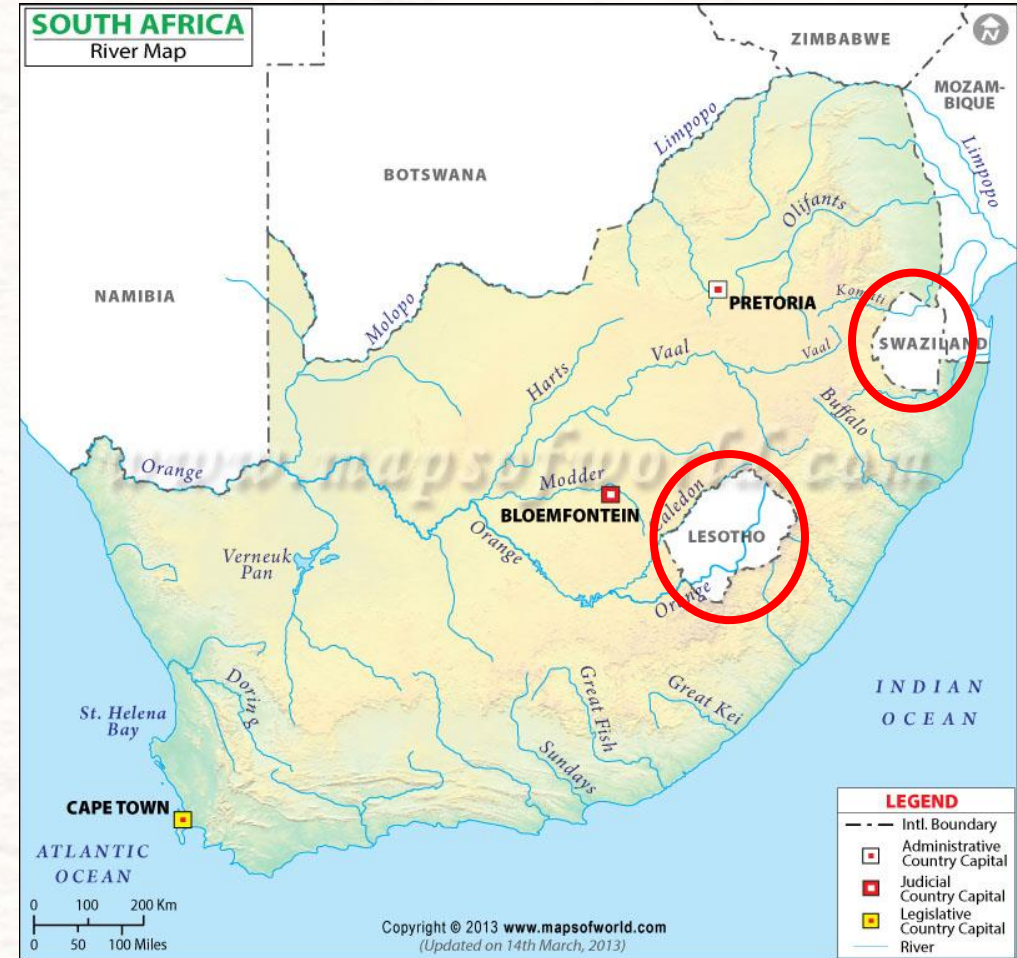
# Transboundary Waters, Governance & SDG's

- Groundwater is of paramount importance to “Ensure availability and sustainable management of water and sanitation for all” (SDG 6)”
- All SDG 6 targets are in one way or another connected to groundwater and require appropriate groundwater governance arrangements, including transboundary, for them to be met.
- Some of these targets tackle challenges to
  - water quality (6.3),
  - water scarcity (6.4),
  - water dependent eco-systems issues (6.6).
  - universal and equitable access to clean water (6.1).
- Target 6.5 acknowledges the importance of IWRM and provides a strong call to “implement IWRM at all levels, including through *transboundary cooperation* as appropriate”.
- This is remarkably relevant in the case of S Africa, Swaziland & Lesotho

# Setting the stage for the comparisons

## Some experiences from Swaziland and Lesotho

- Both have just had an in depth analysis of the status IWRM in the country to improve the approach and update current practices
- Both are transboundary water resources dominated
- Both are experiencing severe stress with a potential destabilisation of their socio-economies and ecosystems
- Both wish to take urgent actions to make significant and serious changes
- Some experiences from these two follow





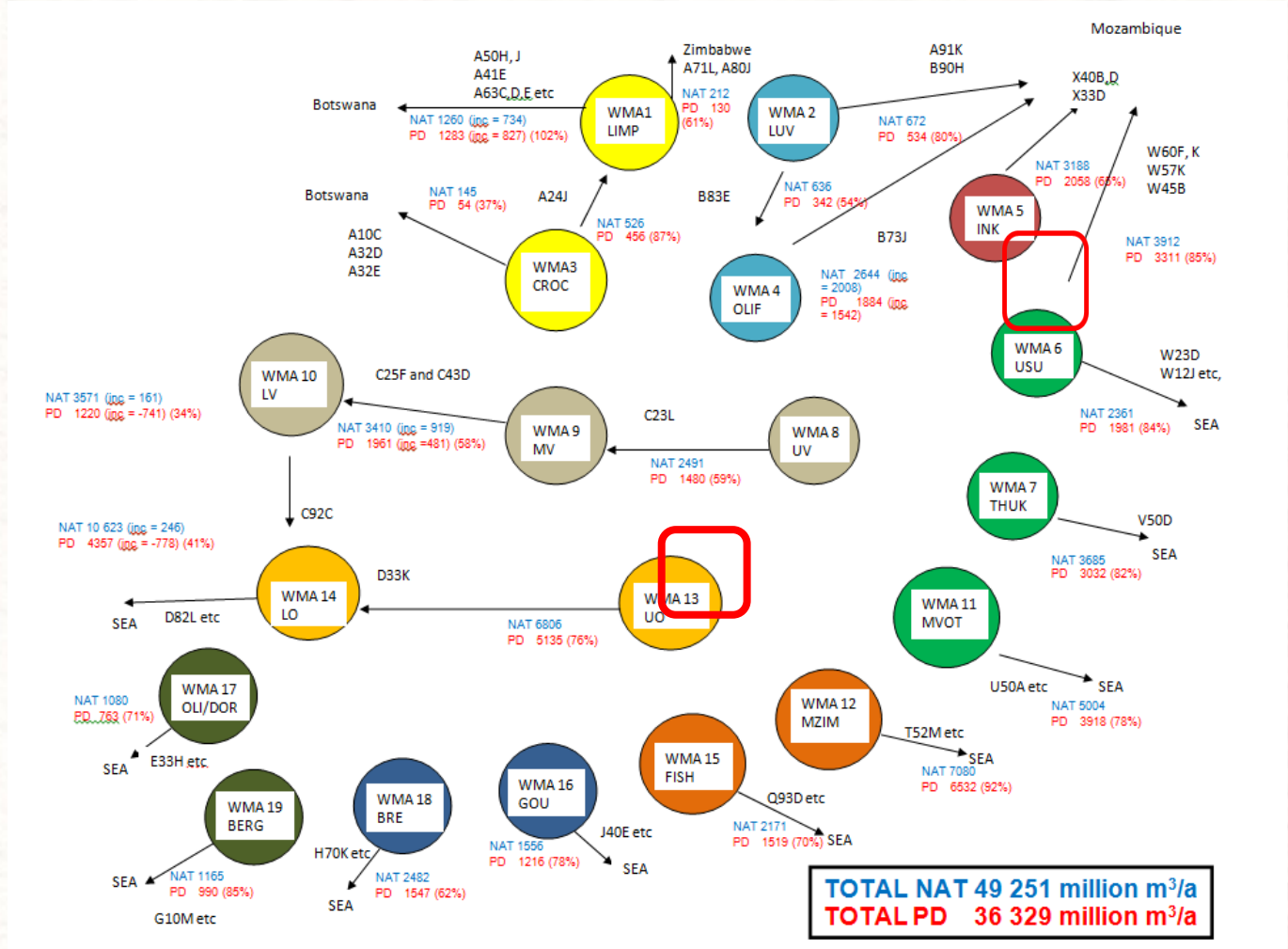
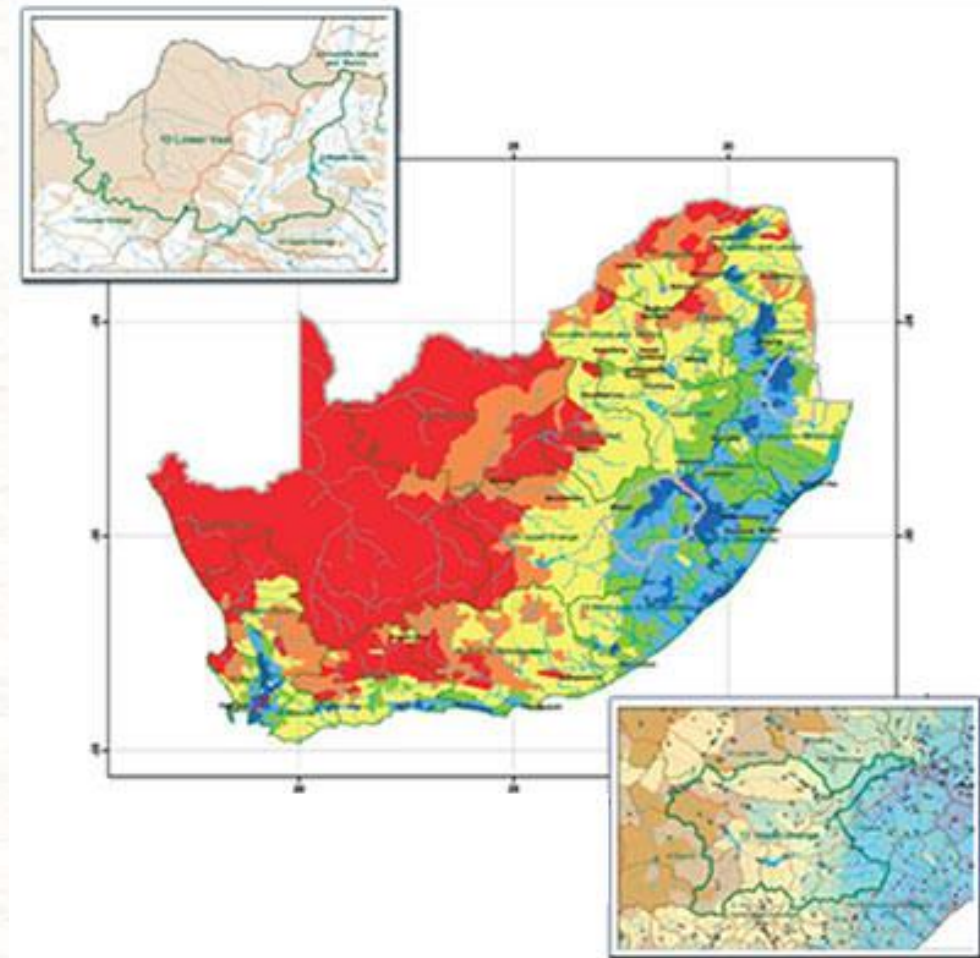
# Scope of country scale actions that contribute to SDG targets (selected list)

## Swaziland IWRM Improvement

- Institutional re structuring
- Review and re assessment of legislation
- Update to the National Water Resources Master Plan
- Development of a Water Resources Management Information System

## Lesotho Integrated Catchment Management

- Development of Plans for integrated catchment management
- Delineation of 'catchments'
- Characterisation of catchment for environmental stress
- Prioritisation approaches
- Update of legal framework, the institutional structures & related capacity development



The water resources of **South Africa, Lesotho and Swaziland** have been analysed up to September 2010. The WR2012 study has incorporated a number of **new tools and analyses** all included in a website for easy access by users.



# Country context in transboundary basins

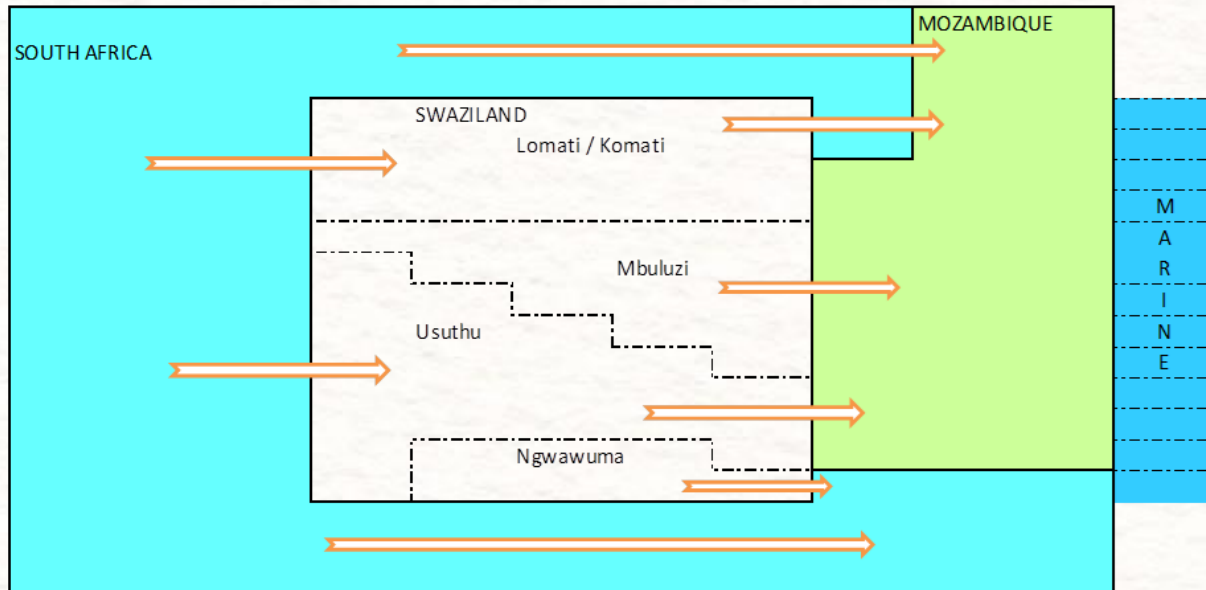


Note - different scales

# The 'systems' at country level

Swaziland – transboundary / transition flows

Lesotho – transboundary water tower – only discharges



## Lesotho - land & water (catchments)

Management Plan

Institutional structure

hydrology / water resources

socio-economy

'boundaries of river basin'

Actions / financing

addresses the critical issue in this basin

engages with community to resolve



# Swaziland - Status of national water balances to 2025 – show significant shortages

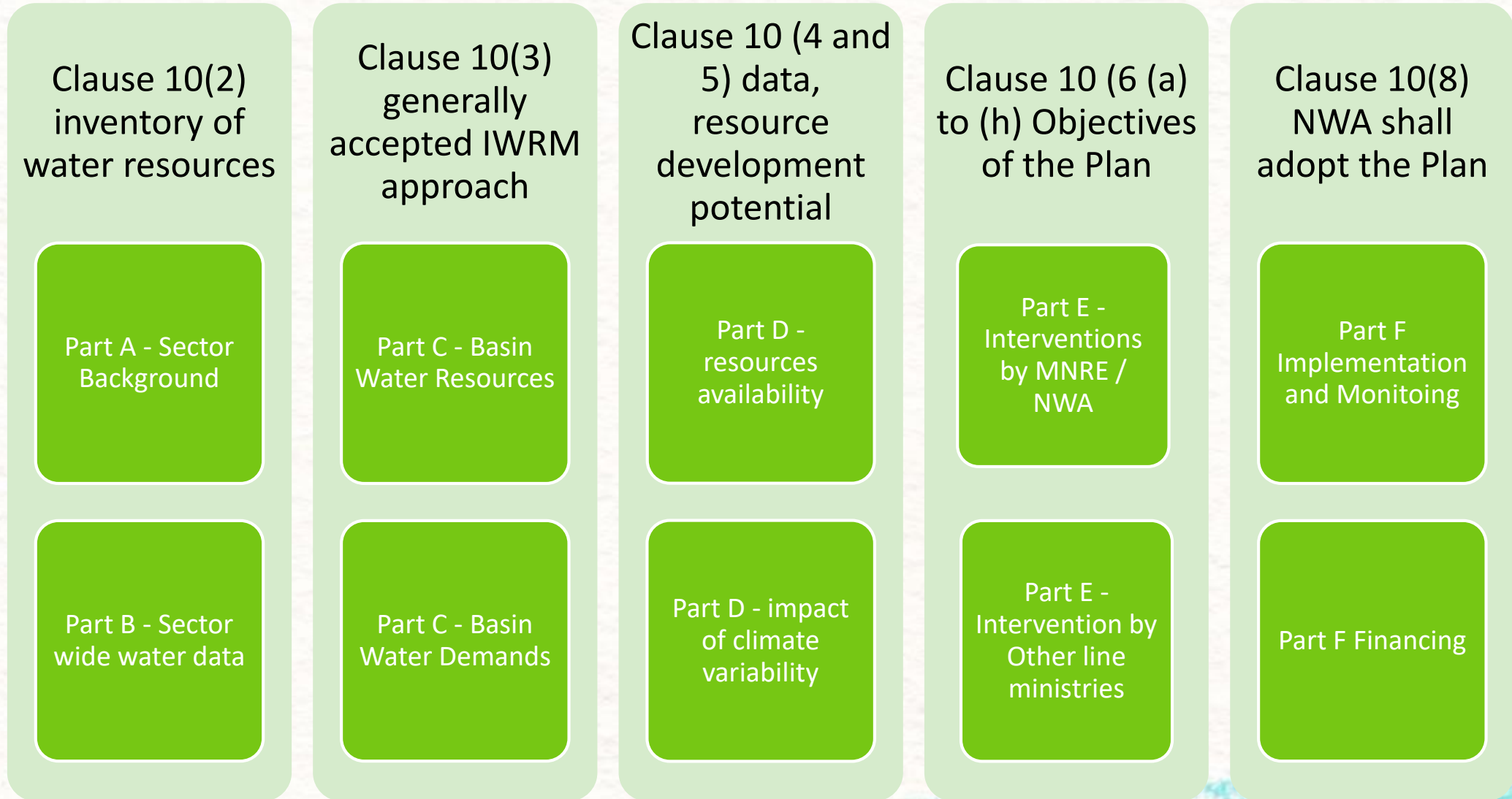
## National water resources balances based on system yields (Mm<sup>3</sup>/a)

### Summary of national water balance

Year	Komati			Mbuluzi			Usuthu		
	Demand	Yield	Balance	Demand	Yield	Balance	Demand	Yield	Balance
2005	287	204	-83	253	295	42	539	549	10
2015	336	204	-132	296	295	-1	760	747.5	-12.5
2025	383	204	-179	334	295	-39	766	747.5	-18.5



# Swaziland - Compliance of Update to Master Plan with the Water Act 2003



# Swaziland - List of DWA & Sector players actions vis a vis Master Plan

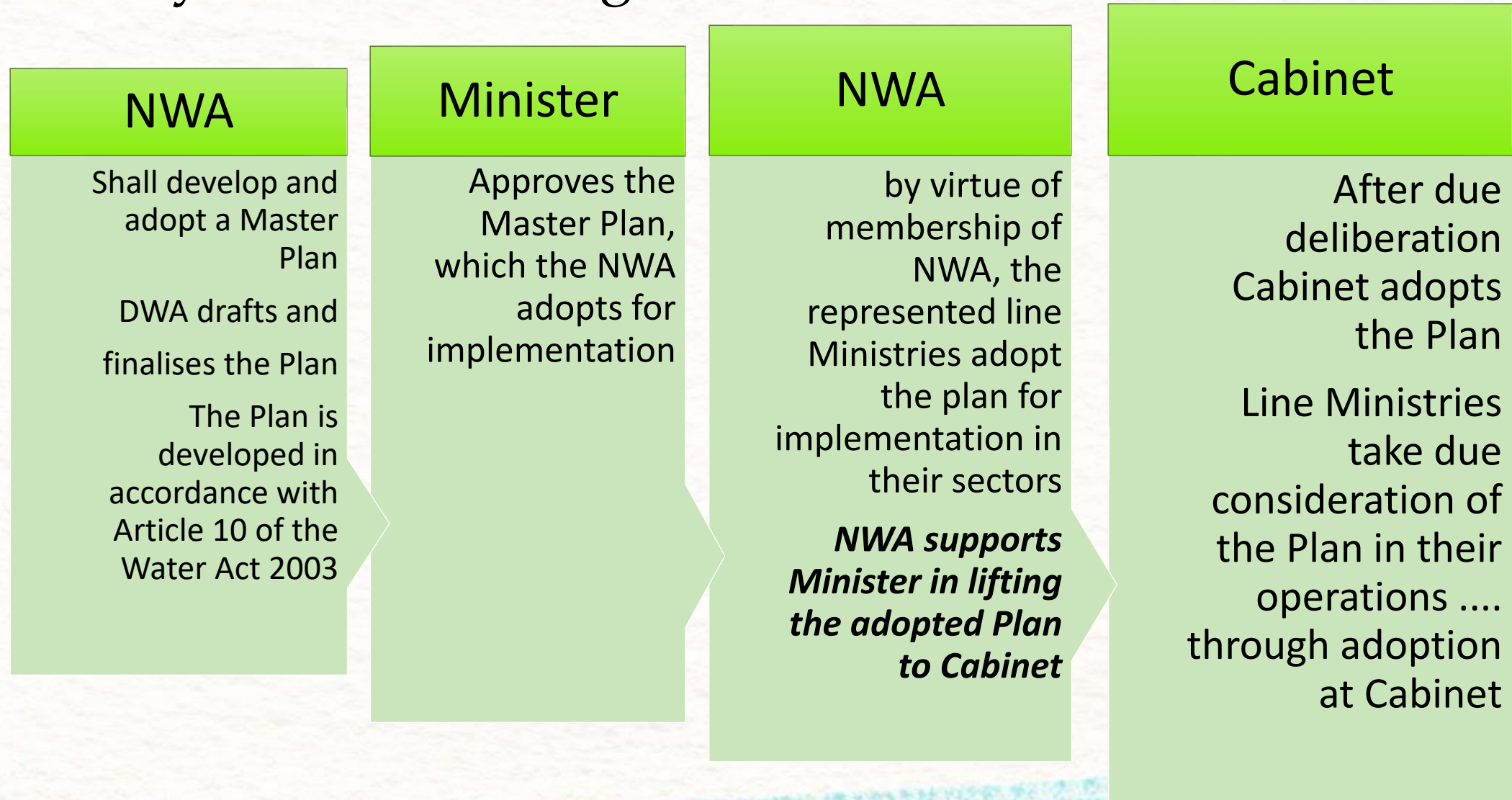
DWA functions	Activities included in the Master Plan Update (2016-25)
<b>On policies, legislation, strategies, plans and actions</b>	
Harmonize policies, legislation, strategies, plans and actions undertaken in the country and in the basin(s) by state and non-state actors relevant to land and water management by means of horizontal and vertical coordination, in particular at international and inter-ministerial level.	<ul style="list-style-type: none"> <li>Review and amend the 2003 Water Act and other of water related laws</li> <li>Gazette the revised RBA mandates</li> <li>Finalize, consult and get approval for Water Policy</li> <li>Liaise with other sector players under the SWAP initiative.</li> <li>Conduct Organisational Review and set up 5 River Basin Institutions</li> <li>WRM Institutional reforms (RBAs, Komati, Irrigation District) (NDP)</li> </ul>
<b>On Project Boards, Irrigation Districts and Water User Associations</b>	
Develop and periodically update policy criteria for the establishment of Project Boards, Irrigation Districts and Water User Associations, consider proposals for establishment from the RBAs, recommend their establishment to the Minister MNRE and, once established, monitor their performance.	<ul style="list-style-type: none"> <li>Review the scope of the current Boards and WUA's</li> <li>Provide operational support and capacity building of Komati, Lomati, Usuthu RBAs</li> </ul>
<b>On transboundary water resources</b>	
Lead the advice to the NWA and participate in transboundary Water Committees, amongst others on international water planning and allocation issues.	<ul style="list-style-type: none"> <li>Operational bio-monitoring program and lab, Transboundary water quality reports</li> <li>Develop and prepare a sound justification for the need to revisit and possibly renegotiate the water allocations in the tri partite agreements</li> </ul>
<b>On master planning (and implementation)</b>	
Develop and periodically update a national framework for water sector master planning; Compile basin level master plans; and engage in national level stakeholder participation.	<ul style="list-style-type: none"> <li>Develop the steps needed for Cabinet level approval of the Master Plan</li> <li>Prepare for a major revision and comprehensive update in 2018, supported by detailed analysis with good forecasting to 2035 and acceptable accuracy forecasting to 2050</li> </ul>
Facilitate and support the implementation of the water sector master plan; secure the planning, budgeting and financing of projects in coordination with other water sector organizations; support the MEPP in the procurement and contract management of approved projects at national level; secure the supervision of project implementation at national level in coordination with relevant stakeholder organizations; organize joint monitoring of the national master plan and participate in the joint monitoring of the basin master plans.	<ul style="list-style-type: none"> <li>Ensure that the once the Cabinet level approach has been obtained, that line ministries are assisted in adopting the relevant parts of the Master Plan for implementation in the given time frames</li> </ul>
<b>On water data</b>	
Compile and maintain permit-related and non-permit related water data from the RBAs and other relevant organizations, process and analyse these data, and provide management information to decision makers; Lead the sharing, communicating and disseminating of water data and information to water sector stakeholders at (inter)national and basin level.	<ul style="list-style-type: none"> <li>Standardization of calibration and methodology of data management</li> <li>Develop computer-based, digital, management information systems to collect, store and allow the easy retrieval and processing of data.</li> <li>Develop and Maintain an up-to-date water resources MIS.</li> <li>Establish a dedicated MIS unit.</li> <li>Create credible structures to facilitate clearance and timeous sharing of relevant data</li> <li>Build capacity for the development and management of water resources information</li> <li>Establish information dissemination mechanisms</li> <li>Establish periodic data processing and analysis protocols.</li> <li>Undertake periodic data processes and analysis.</li> <li>Create relevant laws and regulations to regulate submission, access to and dissemination of water resources information</li> </ul>

<b>On permits</b>	
Develop and periodically update a national water allocation framework; develop permitting regulations for SW abstraction, drilling, GW abstraction, water course alteration, and effluent discharge; and provide decision support to the RBAs on all permit applications.	<ul style="list-style-type: none"> <li>Establish a new methodology for permits, based clearly on sound water resources assessments, based on the findings of mathematical modelling and other such tools</li> <li>Give serious consideration to phased reduction in the volume / rate of abstractions and link them to seasonal conditions</li> </ul>
<b>On water quality and discharge effluents</b>	
Periodically review water quality and effluent discharge standards in collaboration with the relevant stakeholders (MOTEA/SEA, SWASA, others) (N.B. this role to be taken over from RBAs); and collect water quality and effluent discharge samples from the RBAs, analyse them and return the results with recommended actions; In case of (inter)national implications, take the necessary action related to relevant (inter)national organizations.	<ul style="list-style-type: none"> <li>Develop national water quality and sanitation standards.</li> <li>Review legislation to incorporate the enforcement to adhere to water supply and sanitation best practices and guidelines and incorporate regulatory mechanisms</li> <li>Develop new and maintain existing water supply and sanitation facilities/infrastructure.</li> <li>Ensure that good water quality measurements are being conducted and the lab results are reliable</li> </ul>
<b>On standards and regulations on water and soil conservation and ecosystems integrity</b>	
Develop and periodically update standards and regulations to secure water and soil conservation and ecosystem integrity in collaboration with the relevant regulatory stakeholders (MOA, MOTEA/SEA, SWASA, others); define priorities and implementation actions (as part of Master Plan).	<ul style="list-style-type: none"> <li>Engage with MOA on the basis of the Irrigation and other Policies on land management aiming for reduced erosion, reduction in irrigation return waters that contain high levels of agro chemicals</li> <li>Engage with MOTEA in connection with establishing the base line conditions of river ecology and adopting measure to improve it</li> </ul>
<b>On conflicts</b>	
Provide decision support to RBAs regarding basin conflicts with and between drillers, water users, water polluters and other affected parties; if the dispute remains unresolved at basin level, recommend to the NWA to arbitrate and resolve the issue.	<ul style="list-style-type: none"> <li>Use the in house developed tools including mathematical modelling, data assessment and others to ensure the unsound completion for scare water resources is reduced or eliminated</li> </ul>
<b>On emergencies and emergency preparedness</b>	
Develop and periodically update guidelines for national emergencies and flood-risk preparedness in collaboration with relevant stakeholders; review proposals from the RBAs together with relevant stakeholders to declare emergencies; recommend to the NWA for the Minister MNRE to declare emergencies. Apply and secure compliance monitoring of guidelines for large/high-risk dam emergencies and flood-risk preparedness	<ul style="list-style-type: none"> <li>Disaster preparedness plans: for Mnjoli and Lubovane dams, Flood inundation maps, Communication plan</li> <li>Adopt and put into practice the findings and recommendation from the UNDP GEF Projects reports and studies on flood / drought preparedness</li> </ul>
<b>On monitoring service providers' performance</b>	
Develop and periodically update performance standards and regulations for water service providers to secure that water infrastructure is properly managed, that allocated water reaches its points of use and that surface water and groundwater are conjunctively managed.	<ul style="list-style-type: none"> <li>Ensure the SWSC and other service providers data is entered into the WRMIS in a timely fashion and includes all of the information required for monitoring performance</li> </ul>
<b>On safety regulations</b>	
Develop and regularly update safety regulations for the design, construction, and operation and maintenance of hydraulic infrastructures. Apply and secure compliance monitoring of safety regulations for the design, construction, and O&M of large/high risk dams	<ul style="list-style-type: none"> <li>Dams: Dam safety regulations, dam operations and maintenance regulations, Improved O&amp;M, trained staff</li> <li>Adopt and put into place the regulations and guidelines developed under the IWRM Project</li> </ul>

As per the provisions of the Water Act



# Swaziland - Process to adopt Master Plan & activate it by mainstreaming into Government





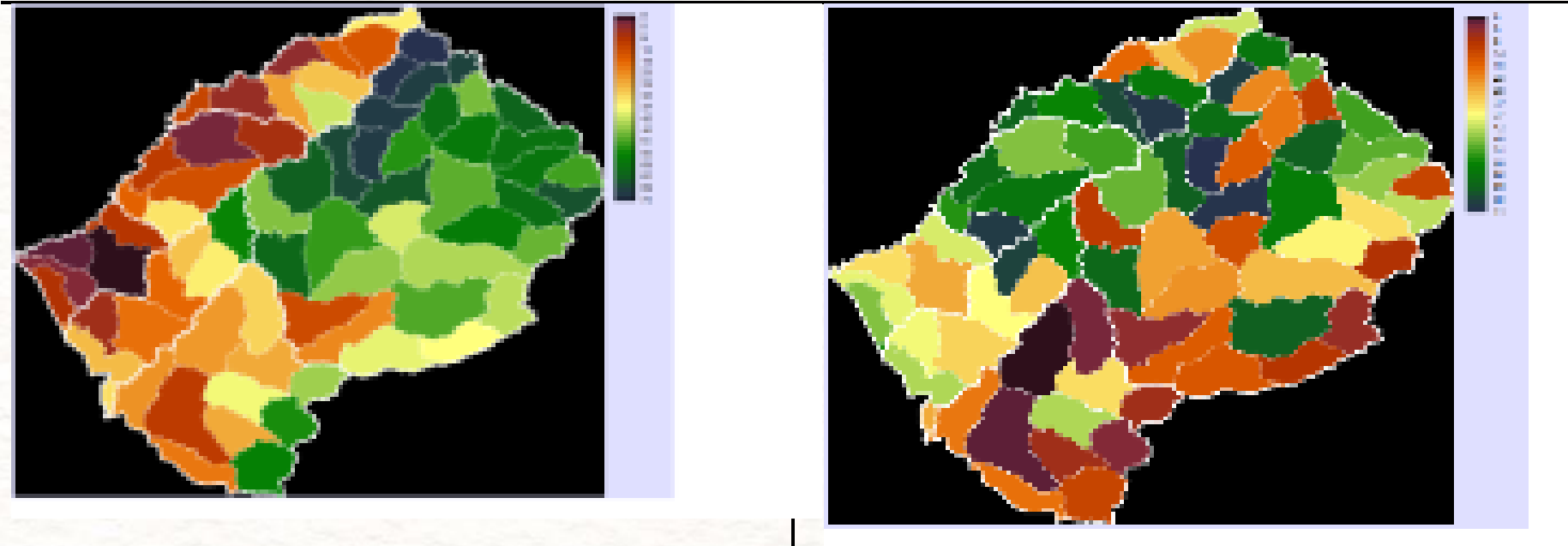
# Lesotho - Integration of activities

- What is to be managed?
  - Six national sub catchments
  - Further sub divided into 74 'micro catchments'
  - Use of DEM, analysis of land scape geomorphology





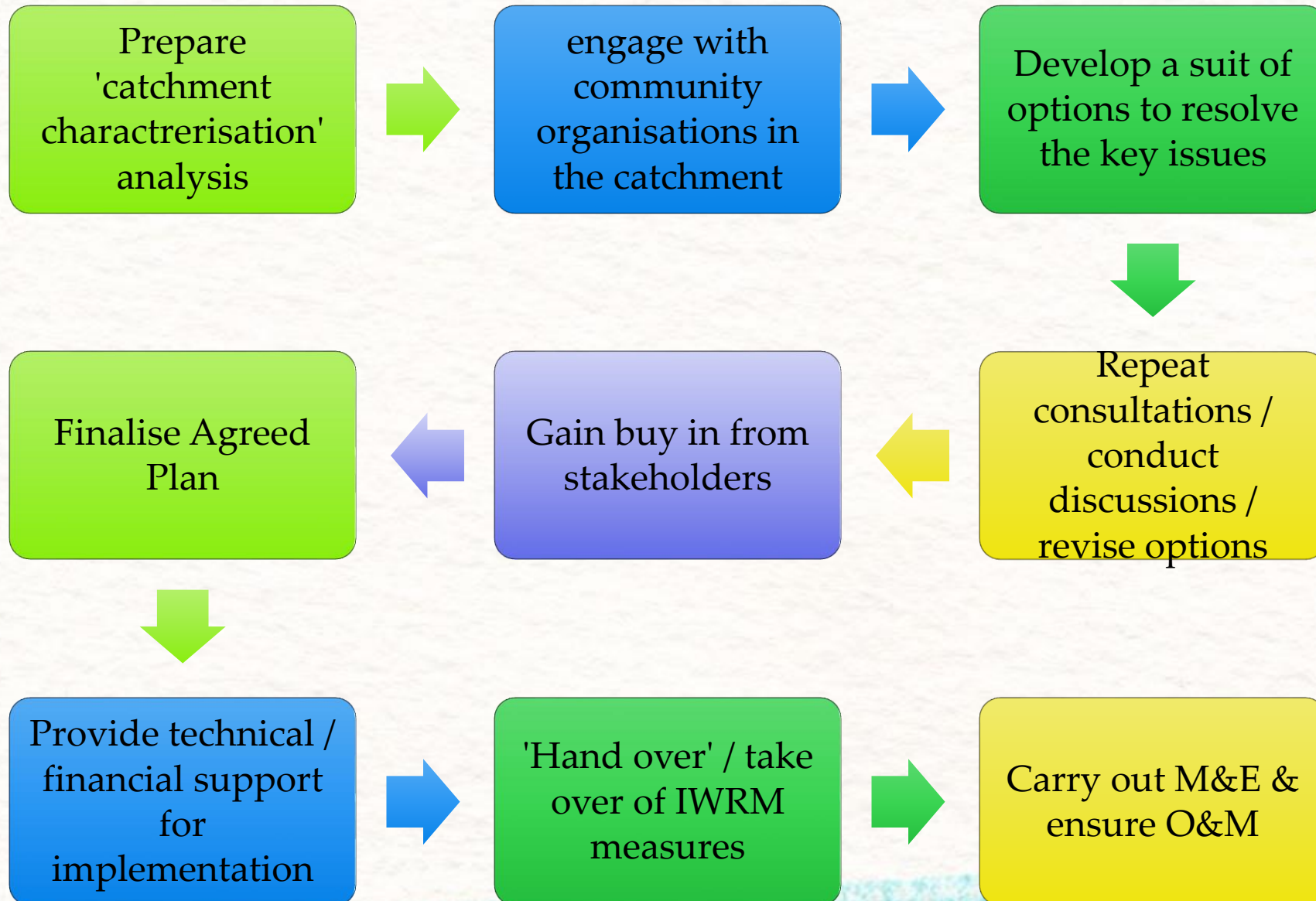
# Lesotho - Ranking approaches



Agricultural activities dominate in darker coloured catchments (LEFT)

Water resource balance issues dominate in the darker coloured catchments (RIGHT)

# A national action plan for each of the 74 catchments





# Lesotho - Environmental stress / sequencing for actions

## EU TA Lesotho - Integrated Catchment Management

Classification of Micro Catchments

Weighted Ranks of Micro Catchments

TOTAL WEIGHT TO APPLY  Remaining

weight	1	weight	0	weight	0	weight	0	weight	0	weight	0
AREA	Weighted Rank	CATTLE / AGRIC	Weighted Rank	SLOPE RATIO	Weighted Rank	DRAINAGE	Weighted Rank	WETLAND	Weighted Rank	EROSION	Weighted Rank
20	20	1	0	48	0	70	0	57	0	26	0
7	7	7	0	57	0	55	0	59	0	28	0
51	51	18	0	59	0	23	0	63	0	14	0
71	71	29	0	70	0	16	0	63	0	4	0
55	55	5	0	67	0	4	0	63	0	15	0
9	9	2	0	66	0	36	0				

SUM Weighted Ranks	Final Rank
20	20
7	7
51	51
71	71
55	55

Micro Catchment no.
13
23
29
57
59

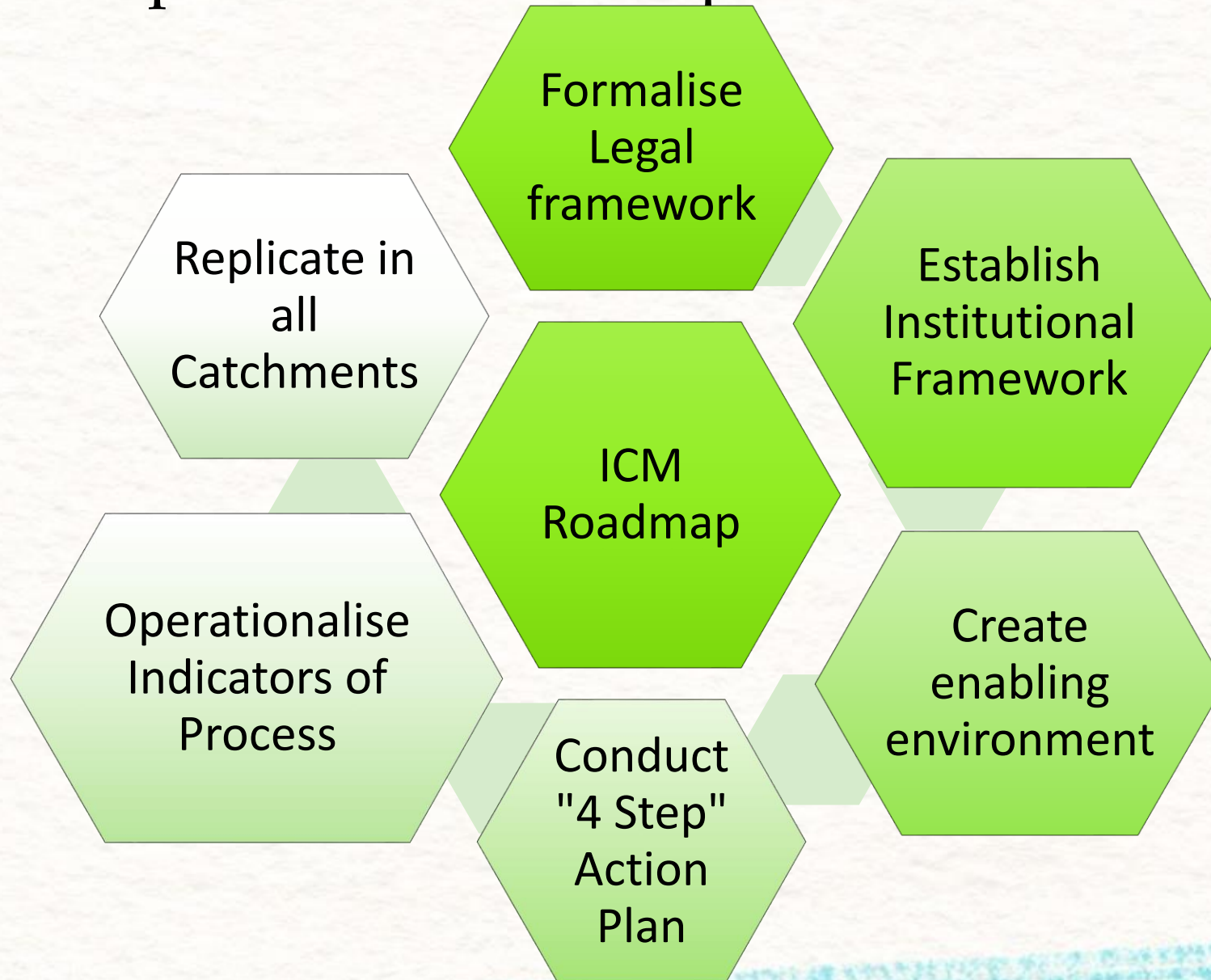
## EU TA Lesotho Integrated Catchment Management

Planning & Sequencing actions in catchments  
Task A: Implementation of ICM Plans

Sequencing / Prioritisation matrix										
Max Weight	10							Total		
Weight	1	1	2	3	1	1	1	10		
Score	Min		1	Max		5				
Criteria for Sequencing Actions	Improved catchment wide mgmt	Multiple benefits with ICM gained	poor land mgmt has impact on community	Water resources critical for strategic	More community engagement for early	Continues past work to reinforce ICM	Builds on institutions in place	Total score	Wighted Score	
Catchment A	Score	3	4	2	1	2	4	5	21	
	Weight	3	4	4	3	2	4	5		25
Catchment B	Score	4	3	2	4	2	3	1	19	
	Weight	1	1	2	3	1	1	1		10
Catchment C	Score	2	1	5	5	2	3	2	20	
	Weight	2	1	10	15	2	3	2		35
.....	Score									
	Weight									
.....	Score									
	Weight									
.....	Score									
	Weight									

Simple EXCEL based evaluation tools developed for putting into place participatory catchment management and planning

# A Roadmap – kick starts the process





# Lesotho – Financing integrated catchment management

## Catchment Management & Development Plan

Community based consultation process (see guidance in back up reports)

## Request to ICM Fund / Local Government Fund

Definition of project(s), programme, feasibility studies, with implementation options

## Two Stage Appraisal

If negative, return to Community to revise

If positive funding as grant, loan or PPP, as appropriate

## Implementation & M&E

Following the agreed procurement process

Routine reporting of progress

# What do we learn?

## Swaziland

- Legislation is in place (Water Act) but its provisions have not been activated in relation to the Master Plan
- The institutional set up of the DWA at the centre with River Basin Organisations at local scale, only just being operationalised
- Several key regulatory functions being devolved to RBO's which have limited capacity for the foreseeable future

## Lesotho

- Legislative framework is in place – but the Long Term Strategy has not been gazetted yet – as provided in the Water Act, nor have the 'catchments' yet been designated
- Only once 'catchments' have been designated, can the local authorities take on their legal obligations as per the Act
- Institutional capacity of LA's will be limited in the foreseeable future



## Complementarity ? Consistency ?

The way ahead in the two  
riparian's

- The drought of 2016 has focused minds – though actions are slow coming
- The ‘enveloping’ South African resources management, which encloses Swazi & Lesotho resource, should provide for framework for complementarity / consistency
- At a ‘macro’ scale this might be discerned – but at micro scale (ie country level) the situation remains disturbing due to national imbalances.
- To transform this, actions required:
  - In Swaziland – Gazette the Master Plan – implement the provisions there
  - Ditto – in Lesotho (The ‘strategy’ and the ‘designation of catchments’)
- Binding Agreements are in place for both countries

## Summary

Key points

COULD USE THE SDG commitments as the framework for country scale actions

**“Ensure availability and sustainable management of water and sanitation for all” (SDG 6)”**

SWAZILAND – water resource balance is showing serious projected shortages; Master Plan is in place – its provisions need to be acted upon

LESOTHO – water & sanitation strategy is in place – it needs gazetting and its its provisions need to be acted upon



Thanks for your attention  
Questions ?

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