Moving from Integrated Water Resources Management (IWRM) to Integrated Natural Resources Management (INRM)

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Midrand, Gauteng

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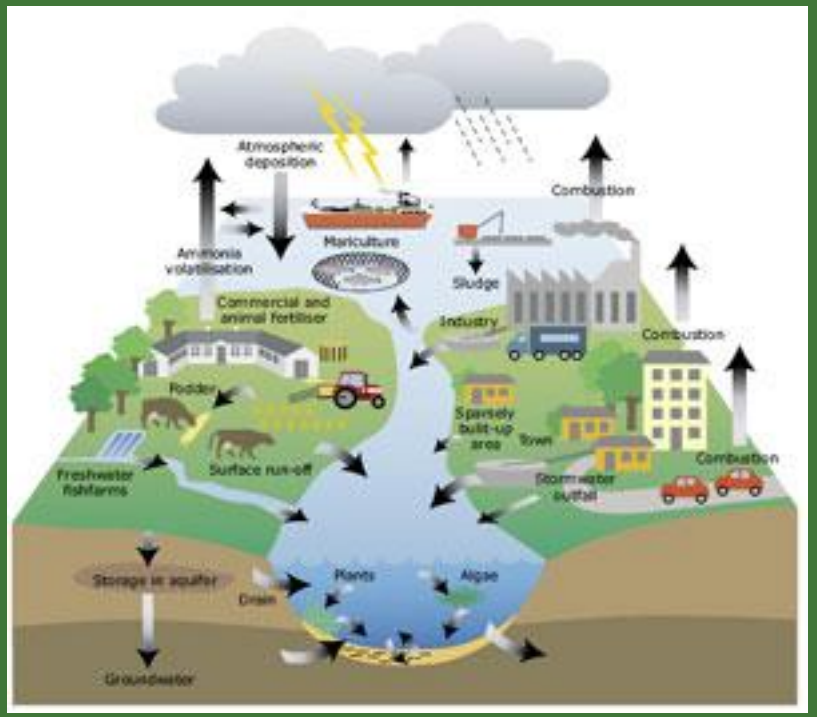
Institute of Natural Resources

MANAGING NATURAL RESOURCES IS COMPLEX

Need to integrate management across:

- *Scale*
- *Boundaries*
- *Natural systems*
- *Sectors & users*
- *Time*
- *Underlying challenges*

This complexity is exacerbated in the case of water resources.



IWRM - WHAT & WHY?

- Effective water resources management (WRM) should inherently involve integration across scale, boundaries ……..
- **BUT** the integration is difficult & not easily achieved
- **SO** we added the 'I' to emphasize the integration.

IWRM

Is a process which promotes the ***coordinated*** *development and* ***management of water, land and related resources*** in order to ***maximise economic and social welfare*** in an ***equitable manner*** without compromising the ***sustainability of vital ecosystems***. (GWP)

ARGUMENT FOR A CHANGE IN APPROACH

All our policy and legislation is founded on the IWRM principles – equity, efficiency, sustainability.

HOWEVER - the National Spatial Biodiversity Assessment (SANBI) reported that:

- 34% of all 440 terrestrial ecosystems are threatened
- 82% of the main river signatures are classified as threatened, 44% are critically endangered.

So we are failing to achieve the required integration necessary to manage our water resources effectively!

WHY ARE WE/IWRM FAILING?

- IWRM is a "***WATER centred approach to Integration***"
- Is this possibly a) Arrogant and b) Contrary to the concept of integration?

Practically the integration intended by IWRM and demanded by our policy and legislation is further undermined by :

- Resource use focus V protection focus of our developmental society.
- Stifling and complex legal framework.
- Complexity of the processes and tools to implement the legislative framework compounds the issue - need to apply the KISS principle.
- Capacity to deal with all of above.

Compendium of Environmental Law (2006):

67 Acts and 500 pages in 2006!

INRM AS AN ALTERNATIVE

The NSBA concluded that:

Quality , quantity and ***sustainability of water resources are fully dependant on good land management practices*** within catchments, so that "*The* ***fate of our countries water resources relies on an integrated approach to managing water and land***".

INRM

An approach that ***integrates*** research of ***different types of natural resources*** into ***stakeholder driven*** processes of ***adaptive management*** and innovation to improve ***livelihoods***, agro-ecosystems resilience, ***productivity*** and ***environmental services*** at community, eco-regional and global ***scales*** of intervention and impact (Ochala *et al* 2010)

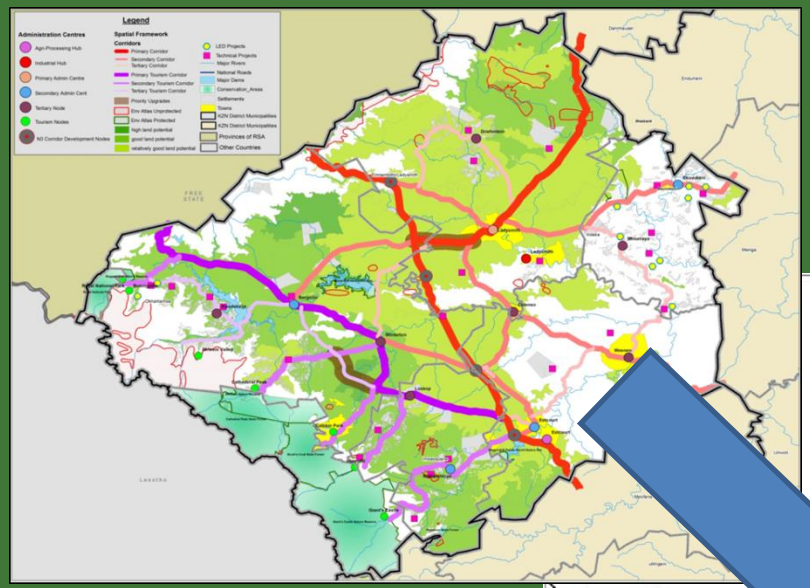
BUILDING A FRAMEWORK FOR INRM IN SA

Essential elements for integrated management:

1. An ecosystem services foundation.
2. District scale focus.
3. Appropriate institutional structure.
4. Long term/holistic focus.
    a. Treating the symptom and the cause.
    b. Providing appropriate incentives for changing management and sustaining it.
    c. Effective monitoring & evaluation to enable adaptive management.
5. Effective stakeholder engagement.

Framework is based on the Afromaison Project: INRM at the meso-scale in Africa

DISTRICT MUNICIPALITY SCALE FOCUS FOR INTEGRATION



DISTRICT MUNICIPALITY SCALE FOCUS FOR INTEGRATION

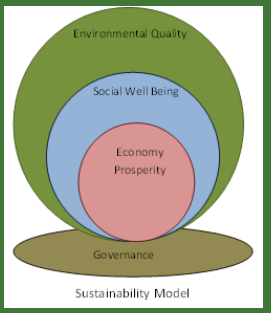
- ***Large enough*** to include large natural systems and deal with cumulative issues.
- Where ***policy is converted to action*** and government interacts with people and users..
- ***LG is mandated with landuse and development planning*** so have significant influence on use of natural systems.
- ***LG is directly reliant on effective NRM to meet their mandates*** (water delivery, sanitation, Local Economic Development LED).
- Integration mechanisms exist at this scale **- IDP.**
- ***Gives effect to the decentralisation process*** - Institutionally, provincial and national government departments are regionalised at the district level.

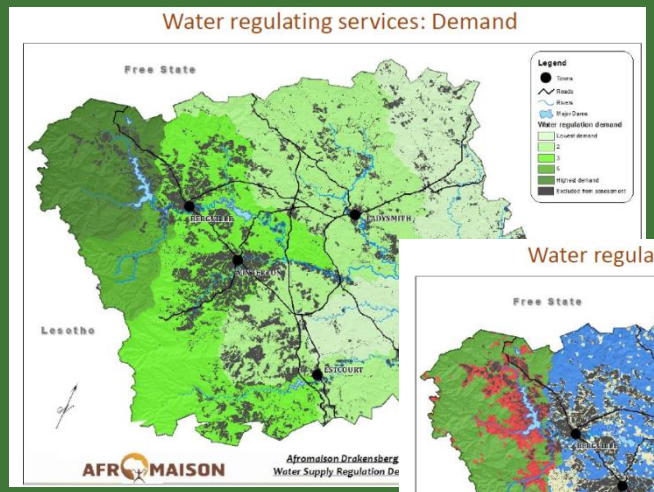
So the focus on an ADMINISTRATIVE rather than a NATURAL Boundary - SIGNIFICANT DEPARTURE FROM IWRM

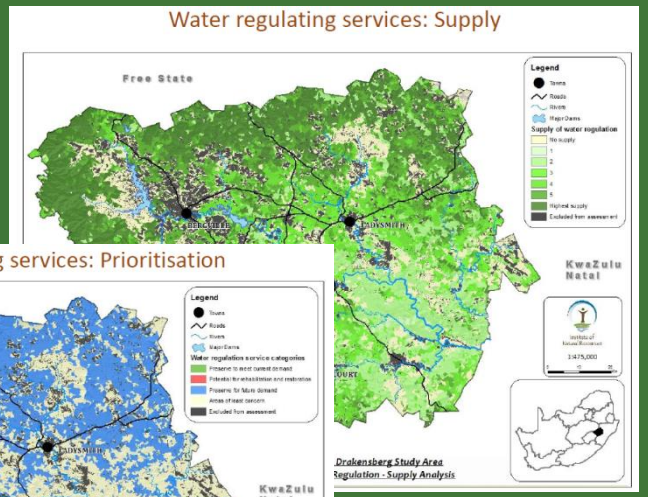
Does not mean you reduce the value of the natural systems within the admin boundary.

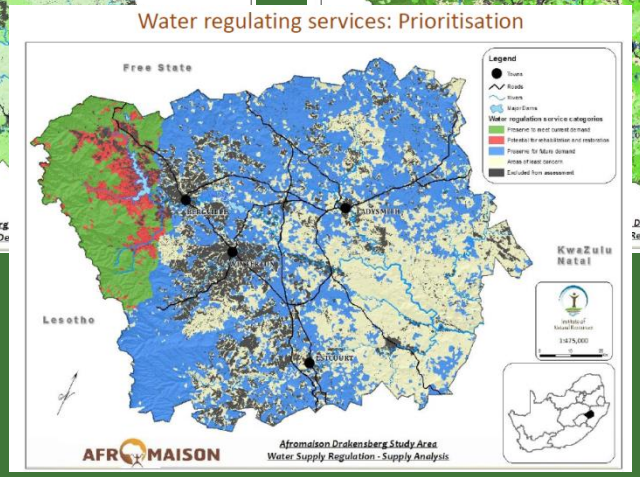
ECOSYSTEM SERVICES FOUNDATION

- Gives effect to the sustainability model.
- Language municipal staff and stakeholders understand.
- Facilitates integrated understanding and ‘agreed’ vision.
- Prioritized 6 Ecosystem Services (water & other services)
- Mapped SUPPLY + DEMAND = PRIORITY MANAGEMENT AREAS





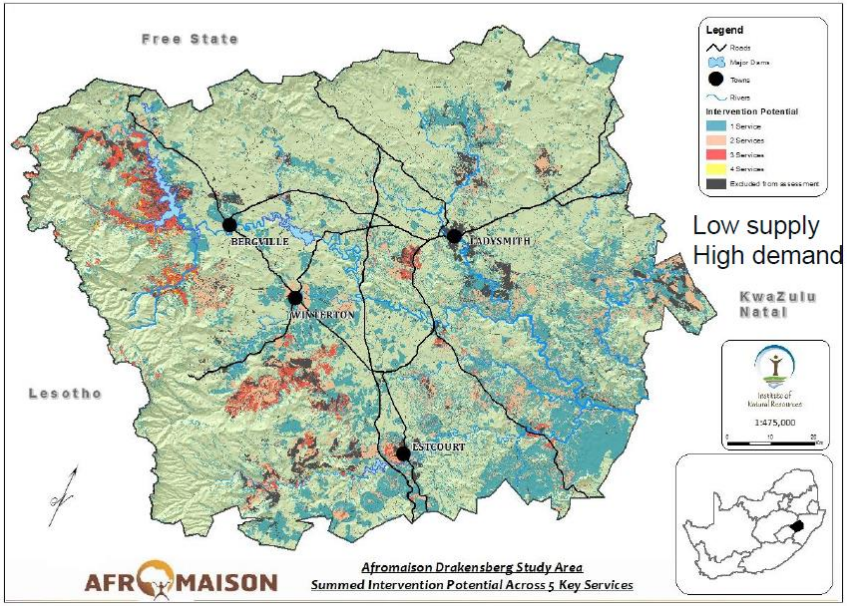




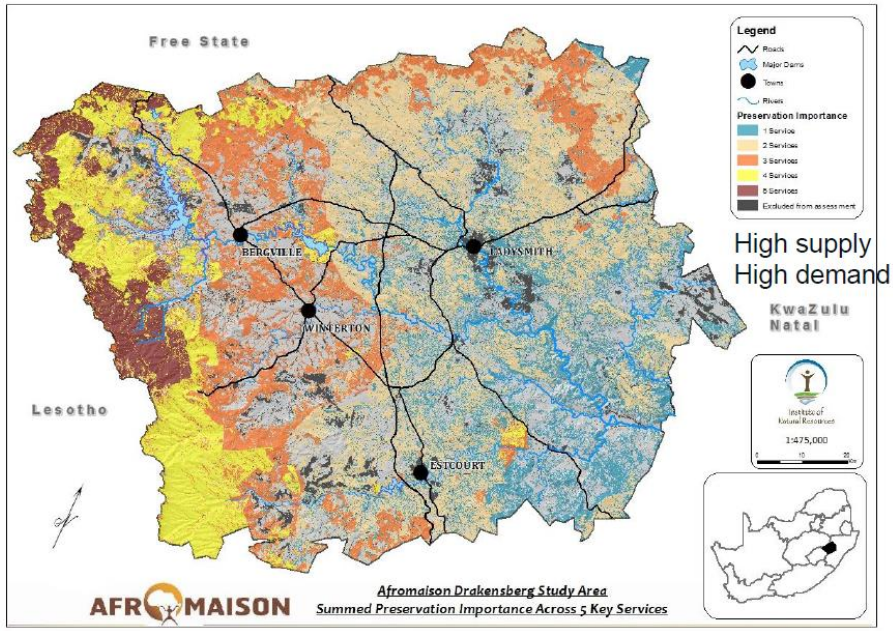
ECOSYSTEM SERVICES

- ***INTEGRATES ACROSS SCALE –*** the full value of the natural resources beyond administrative boundary is considered.
- ***INTEGRATES ACROSS SYSTEMS***
- Outcomes of the other services ***REINFORCED*** need water resource priorities.
- ***COMBINED PRIORITY MANAGEMENT MAPS*** for all key services to establish priorities for protection and restoration.

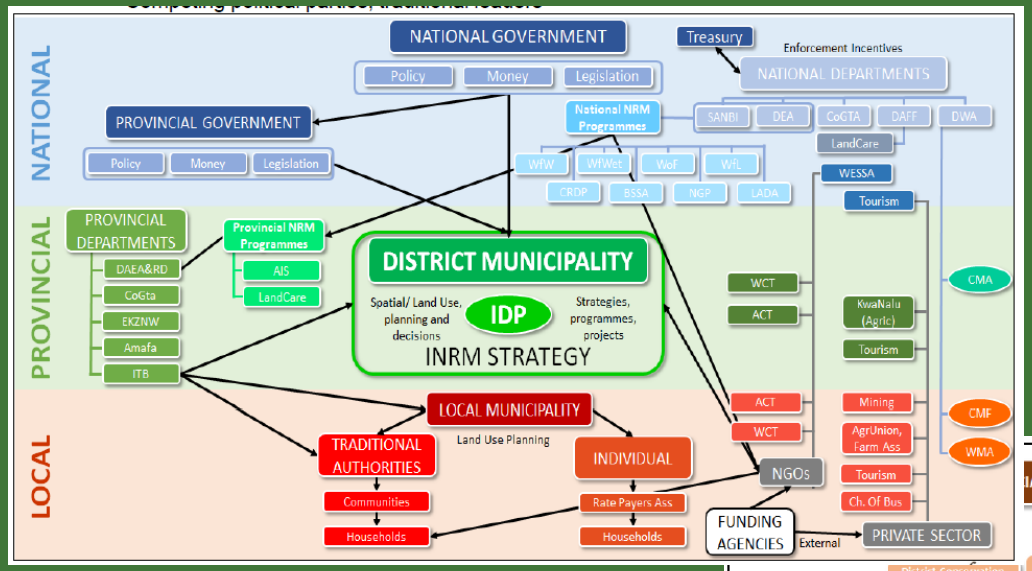
Optimise resources: Remedial intervention

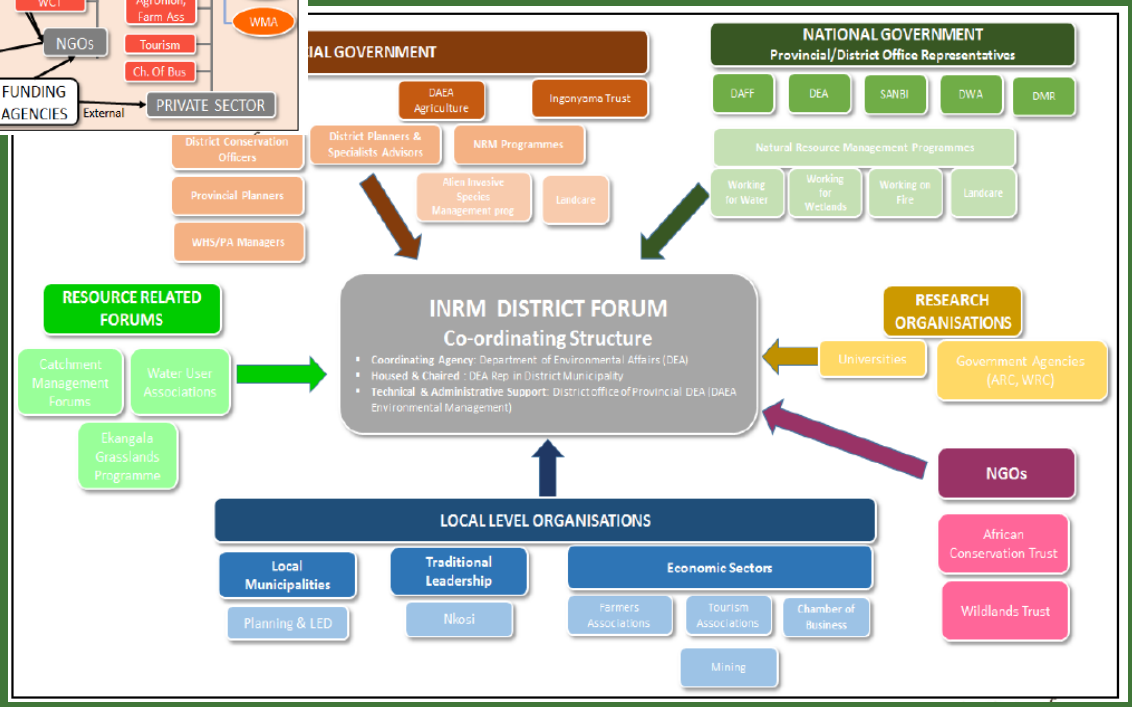


Optimise resources: Preservation



APPROPRIATE INSTITUTIONAL CO-ORDINATION





Potential to achieve

VERTICAL

&

HORIZONTAL

integration

LONG TERM VIEW

Understand the whole picture.

Environmental Challenge	Drivers of Environmental Challenges / Problems	Underlying Cause	Intervention
Degradation of grasslands with resultant loss of productivity and ecosystem services potential (local focus on ecosystem goods- grazing - and services - water production)	Poor grazing management resulting in degradation of grasslands, increased erosion and declining biodiversity	Overgrazing - Stocking rates too high but driven by cultural and traditional values associated with livestock; livestock kept too long in areas close to homesteads to avoid theft	Improved grazing management (e.g. rotation; alternative fodder; stock reduction) improve herd quality to reduce quantity
			Rehabilitation of dongas (gully plugging, gully cutting) and re-vegetation
		Inappropriate burning practice e.g. to stimulate new growth for grazing but at wrong time of year; by thieves and poaches to draw animals into a target area etc.	Improved burning practices and emphasis on need for grazing and livestock management
		Soil erosion due to overgrazing, uncontrolled tracks, over use of preferred herding routes	Inclusion of green infrastructure to buffer paths and tracks and footpath planning and maintenance, Soil erosion control with cross-slope barriers - contour bunds; terraces etc.

LONG TERM VIEW

Identify & develop appropriate incentives for changing and sustaining appropriate management.

- Decision Support Tool (DST) http://www.afromaison.net/eco_dss/DS_tool.html
- Design Matrix Tool (DeMax Tool)

Economic Instrument	World Heritage Site (Zone A)	Communal Tenure Areas (Zone B)	Private Tenure Areas (Zone B)
Payment for Ecosystem Services	X	X	X
Environmental Subsidies	X	X	
Strengthening Ownership Rights		X	
Strengthening Use Rights	X	X	
Voluntary Environmental Agreements		X	X
Tax Differentiation			X
Environmental Certification	X		X
User Charges	X		
Tradable Permits and Quotas		X	

LONG TERM VIEW

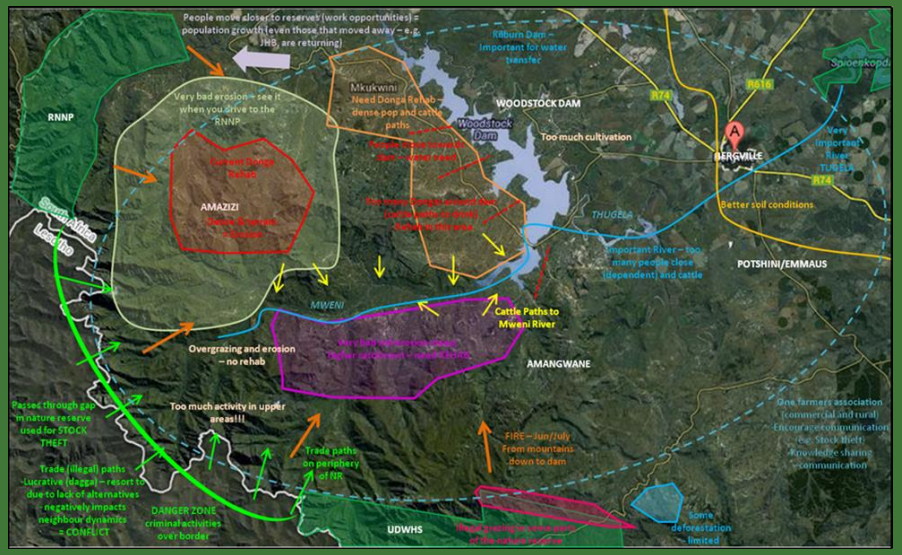
Effective Monitoring and Evaluation to inform Adaptive management

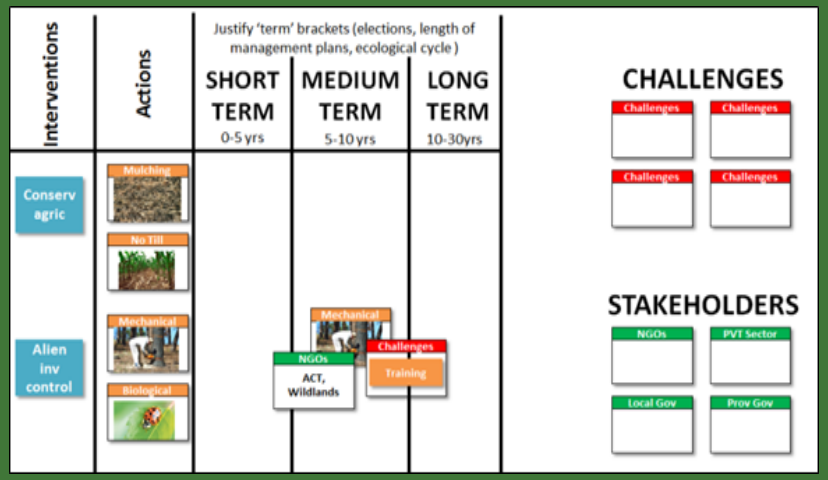
- Appropriate, citizen based monitoring methods
- Biophysical **& GOVERNANCE** indicators.

INRM SUCCESS INDICATORS					
System	***Criteria***	***Indicator***	***Target***	***Measure***	***Data Source & Method***
Natural Systems					
Water Resources	Quality	Capacity of large storage impoundments.	Decrease in the rate of reduction in dam capacity	Rate of decline in dam capacity measured as % of total capacity/per year.	Hydrographic survey undertaken by DWA Directorate: Spatial and Land Information Management (Reference: http://www.dwaf.gov.za/bi/services.htm)

EFFECTIVE STAKEHOLDER ENGAGEMENT

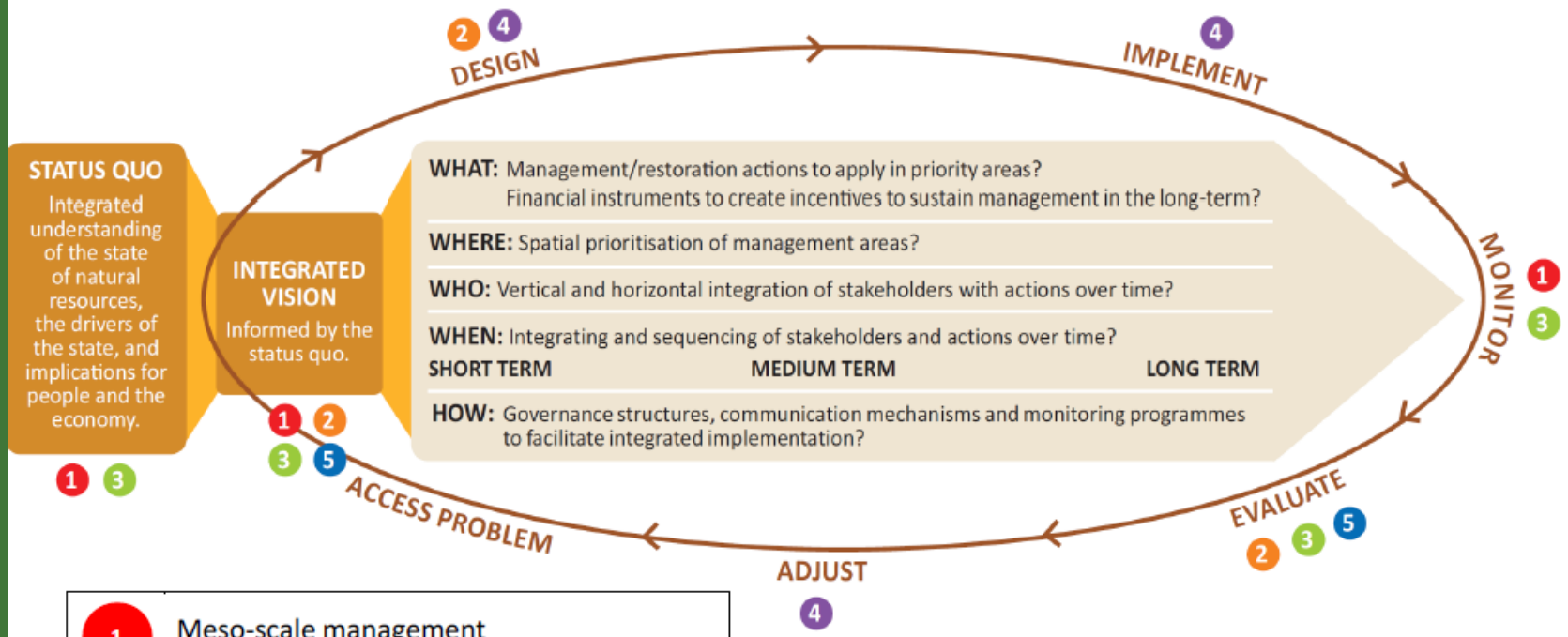
- Range of methods used.
- Time and space to engage.





Buffer Zone: Communal Tenure

	Short Term (0-5 years)					Medium Term (5-10 years		
Intervention	**Actions**	**Challenges**	**Solutions**	**EIs**	**Stakeholders**	**Actions**	**Challenges**	**Solutions**
AIS Control	Mechanical Control Chemical Control	Threat vs. resource Chemical runoff (hazard) Monitoring and rehab once removed	Clear riparian zones, not all Rehab, monitoring etc.	Environmental Subsidies	NGOs - funding challenge (follow up) Local Gov. - need to prioritise issue (allocate funding)	Biological control Breading programs (e.g. non fertile wattle)	Research	Lucina example of success
Fire management	Devise Fire management plan	Is in place but needs to be long term Need single FPA (communal and private)	Training, monitoring, etc. Awareness and education (fire ambassador, ext. officer	Environmental Subsidies	Trad communities: livestock owners NGOs: currently subsides Local gov: need to put breaks in			
Grazing management	Reinstating herders Establish and mobilise grazing associations	Who pays herders?	Building block to rotational rest system increased economic return from herd Reduction in stock theft	Environmental Subsidies	Trad communities" livestock owners (drive actions)	Rotational resting system IC/PastureLM	Need to buy-in of all STHs Initial alternative area for first rest Winter (arable land communal resource Need to find most appropriate crop	
Water Use	Flow regulation Rain water harvesting Service provision	Funding???			Trad communities Local Gov	Control Abstraction		



1. Meso-scale management
2. Social simulation and complex systems
3. Ecosystem services approach
4. Matching interventions with economic incentives
5. Scenario analysis

The Afromaison Approach