INTEGRATION OF BIOPHYSICAL, ECONOMIC AND SPATIAL TOOLS INTO GOVERNANCE OF RESOURCES – DEMONSTRATED IN THE DRAKENSBERG MOUNTAINS, SOUTH AFRICA

Drakensberg, November 2012

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Stakeholder ranking of issues

THEME	WHS	Buffer	Outside	TOTAL
THE NEED FOR GOOD MANAGEMENT AND GOVERNANCE OF NATURAL RESOURCES AND THE ENFORCEMENT OF NRM / PLANNING LEGISLATION	18	8	19	**45**
THE NEED FOR ENVIRONMENTAL / INRM EDUCATION AND AWARENESS	11	8	12	**31**
THREATS TO THE ENVIRONMENT AND LOSS OF BIODIVERSITY	12	4		**16**
THE NEED FOR APPROPRIATE ECONOMIC DEVELOPMENT		13		**13**
LAND DEGRADATION			10	**10**
UNCONTROLLED DEVELOPMENT ACTIVITIES		8		**8**
POLLUTION			8	**8**
POOR LAND USE PRACTICES		7		**7**
MAKING FINANCIAL AND HUMAN RESOURCES AVAILABLE FOR INRM	5			**5**
UNCERTAINTY ASSOCIATED WITH LAND REFORM		5		**5**
ILLEGAL ACTIVITIES (I.E. CRIME AS OPPOSED TO ENFORCEMENT OF NRM LEGISLATION)		4		**4**

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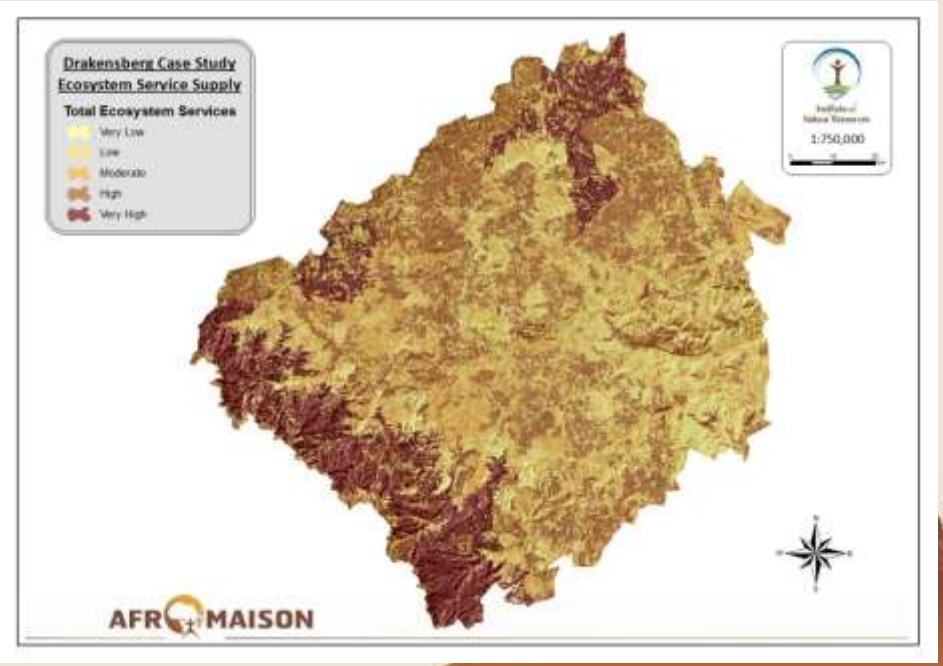
Socio-Political situation

- History concentrated too many people in a small area
- Transition from traditional to democratic structures
- Politicisation of municipal functions leads to collapse
  - *"ethos of non-functionality…."*
  - *26 political assassinations over the past few years*
- Loss of influence of traditional authorities
  - Management of stock and resources collapses
  - Conflicts between grazing management and cattle for cultural purposes
  - Stock theft becomes rampant
- Many failed attempts at NRM
- Yet – the positive
  - promising participation in community wilderness area and stewardship programme

The Ecosystem Services Approach - *"benefits humans derive from nature"* (MA 2005)

- Ecosystem services as a baseline data layer for management
- Spatial distribution
- Health of the ecosystem



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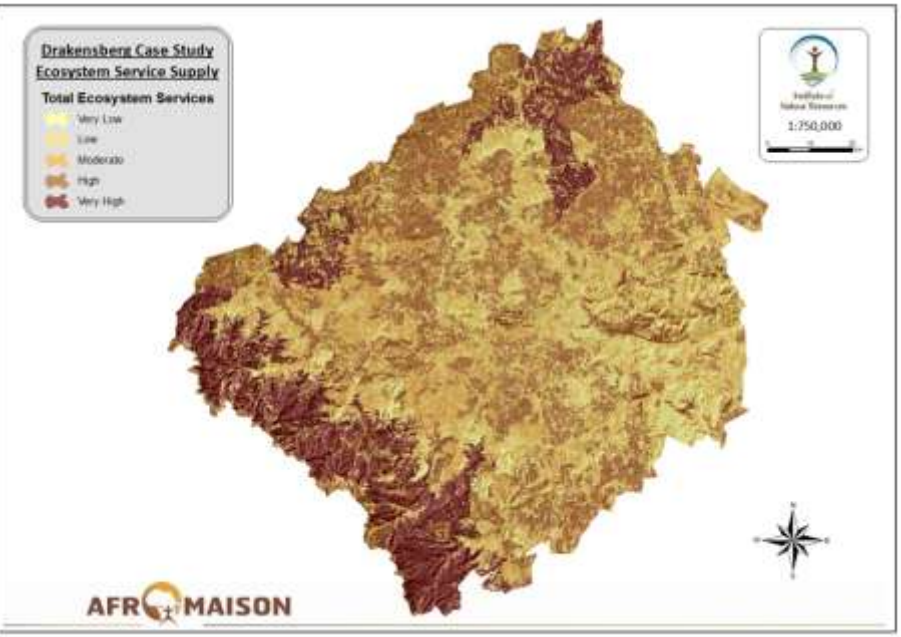
The Ecosystem Services Approach

Land cover categories	Ecosystem services																		Supply scores				
	Provisioning					Regulating							Habitat		Cultural								
	Food	Grazing	Raw materials	Fresh water	Medicinal resources	Local climate & air quality regulation	Carbon sequestration and storage	Moderation of extreme events	Waste-water treatement	Erosion prevention and maintennace of soil fertility	Pollination	Biological control	Habitats for species	Maintenance of genetic diversity	Recreation and mental and physical health	Tourism	Aesthetic appreciation and inspiration for culture, art and design	Spiritual experie and sense of place	Provisioning	Regulating	Habitat	Cultural	Total
Plantation	1	0	3	0	0	2	1	1	0	1	0	0	1	0	2	0	1	1	4	5	1	4	14
Alpine grass-heath	2	2	1	3	3	1	2	2	0	3	0	0	3	3	3	2	2	3	11	8	6	10	35
Annual commercial crops dryland	3	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	6	1	0	2	9
Built up dense settlement	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	2	1	0	2	0	4	6
Bushland (< 70cc)	2	2	1	2	2	2	2	2	0	2	0	0	3	3	2	2	2	2	9	8	6	8	31
Dense bush (70-100 cc)	2	2	2	2	2	2	2	2	0	2	0	0	3	3	1	1	2	2	10	8	6	6	30
Forest	2	1	3	0	3	3	3	3	0	3	0	0	3	3	3	3	3	3	9	12	6	12	39
Grassland	2	3	1	3	3	1	3	2	0	3	0	0	3	3	3	3	3	3	12	9	6	12	39
Grassland / bush clumps mix	2	3	1	2	3	1	2	2	0	2	0	0	3	3	3	3	3	3	11	7	6	12	36
Low density settlement	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	1	3	4
Mines and quarries	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Old cultivated fields - grassland	1	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	4	1	1	0	6
Permanent orchards (banana, citrus) irrigated	3	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	3	2	0	1	6
Susbsistence (rural)	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	3
Water natural	1	0	1	3	1	1	0	0	2	0	0	0	3	3	3	2	3	3	6	3	6	11	26
Wetlands	1	3	3	3	3	0	2	3	3	2	0	0	3	3	2	2	3	2	13	10	6	9	38
Woodland	1	2	2	2	2	1	2	1	0	2	0	0	3	3	2	2	2	2	9	6	6	8	29


Drakensberg Case Study
Ecosystem Service Supply
Total Ecosystem Services
Very Low
Low
Moderate
High
Very High
1:750,000
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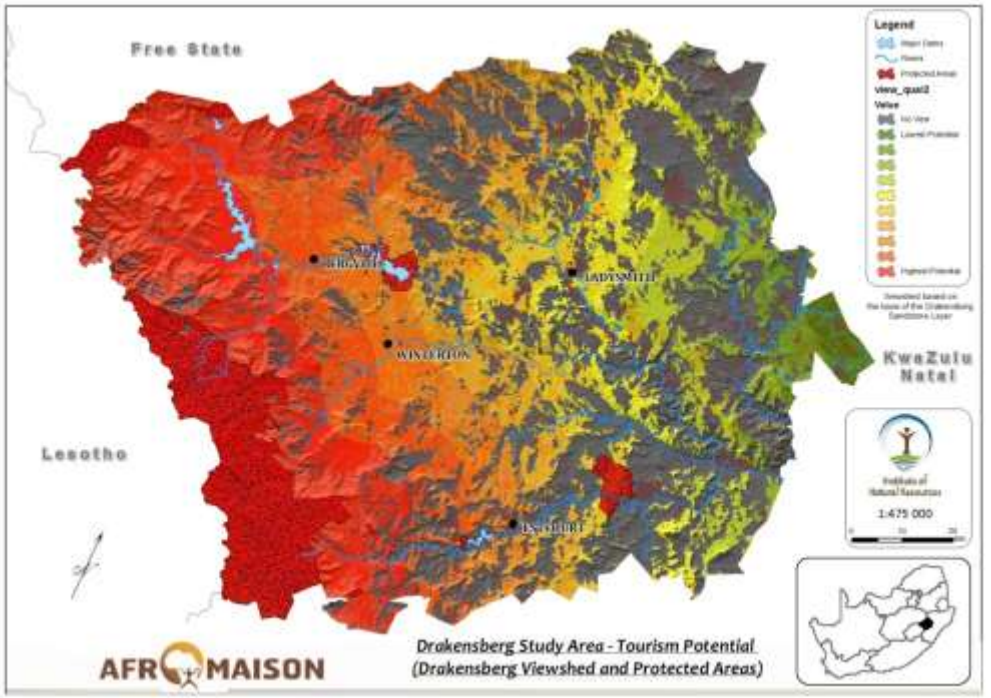
Free State
Lesotho
KwaZulu Natal
BERGVILLE
LADYSMITH
WINTERTON
ESTCOURT
Legend
1:475 000
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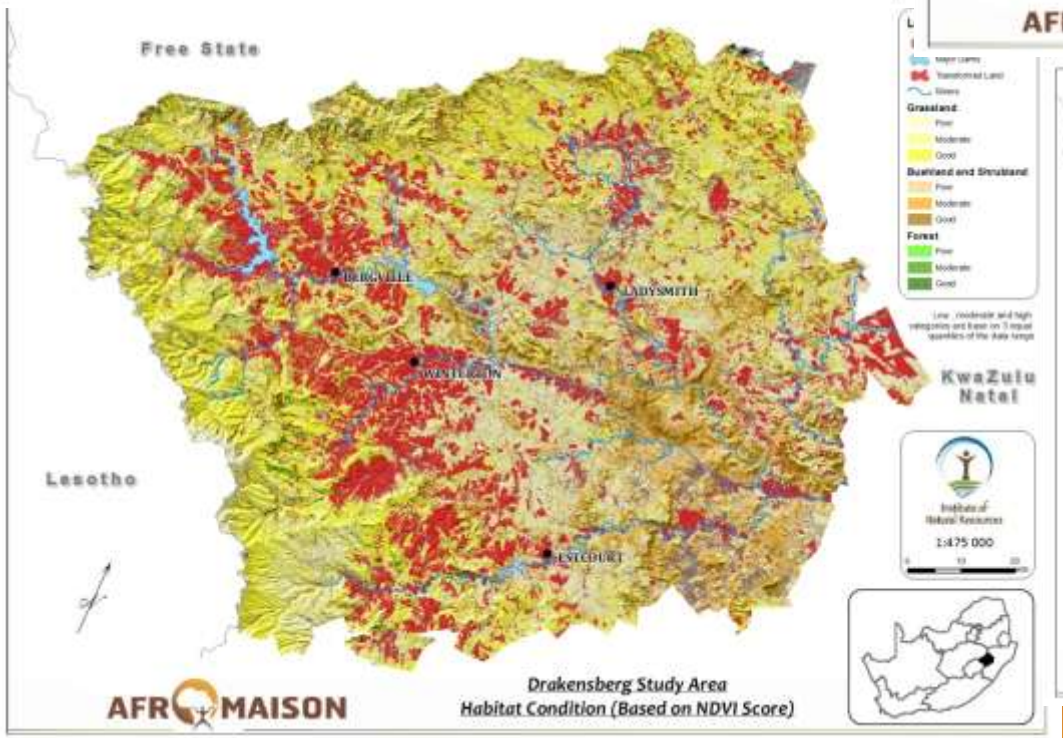
Drakensberg Study Area - Tourism Potential
(Drakensberg Viewshed and Protected Areas)


Free State
Lesotho
KwaZulu Natal
BERGVILLE
LADYSMITH
WINTERTON
ESTCOURT
Grassland
Poor
Moderate
Good
Bushland and Shrubland
Poor
Moderate
Good
Forest
Poor
Moderate
Good
1:475 000
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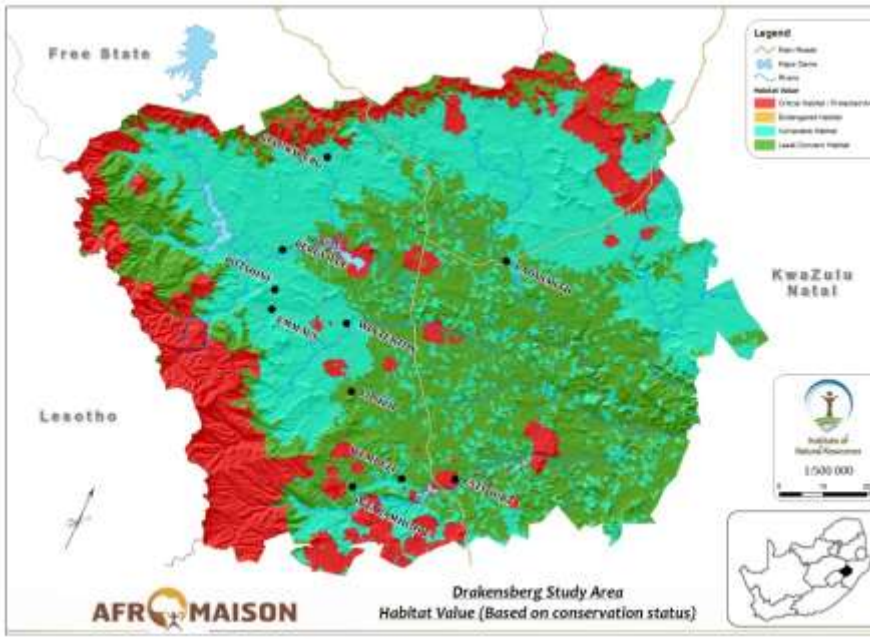
Drakensberg Study Area
Habitat Condition (Based on NDVI Score)


Free State
Lesotho
KwaZulu Natal
Legend
1:500 000
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Drakensberg Study Area
Habitat Value (Based on conservation status)

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Operational Framework

Catchment Provision of Ecosystem Services

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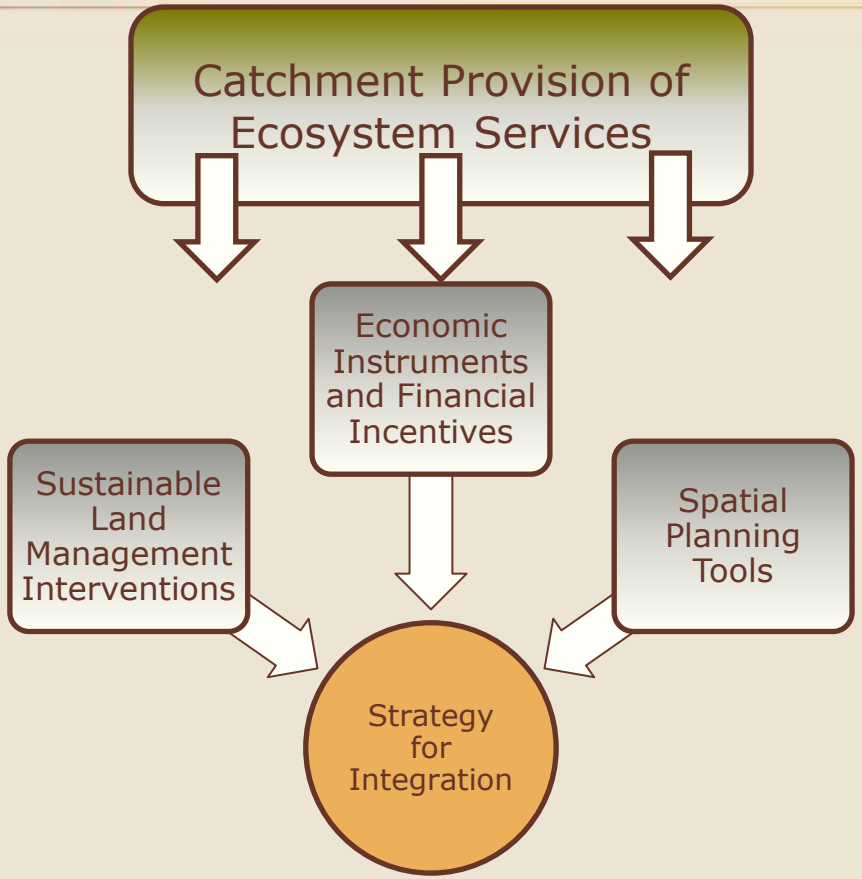
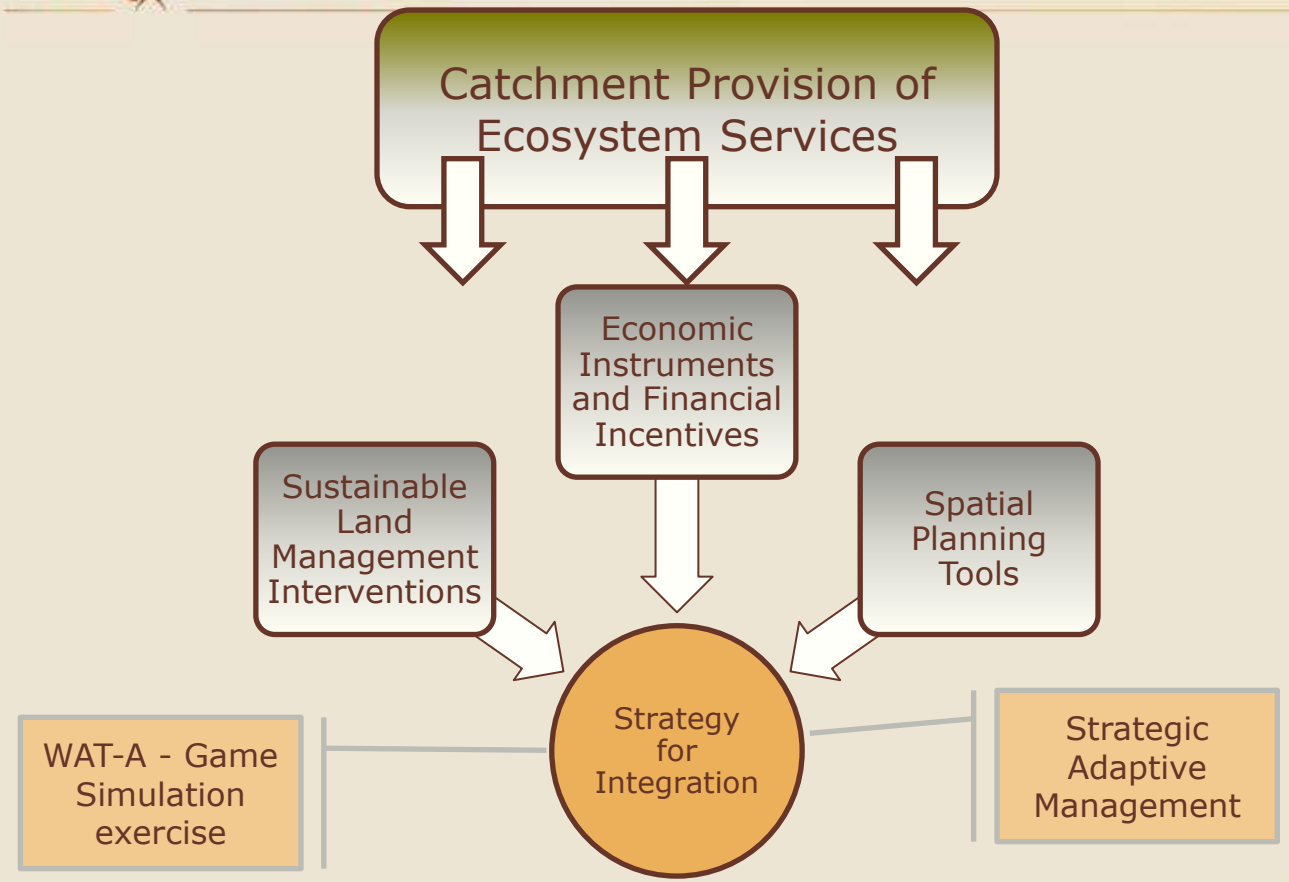
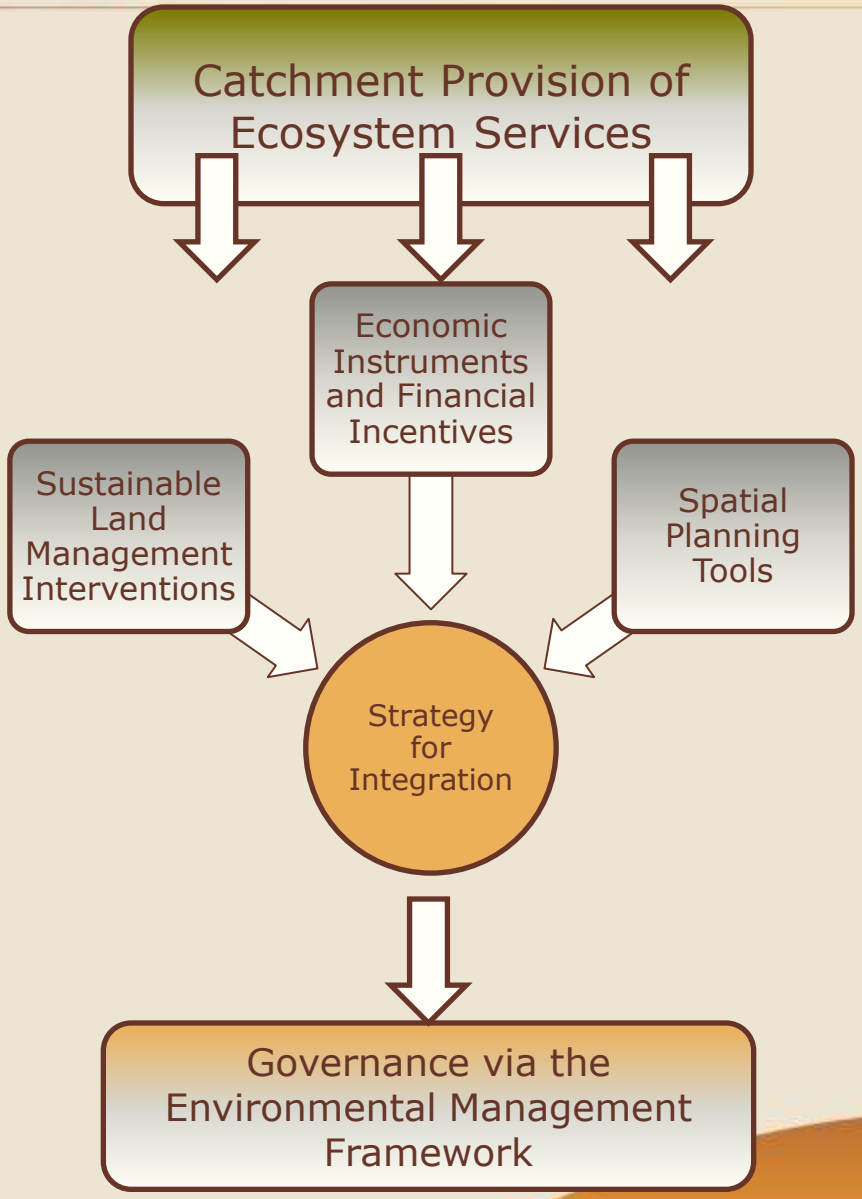
Operational Framework



Operational Framework

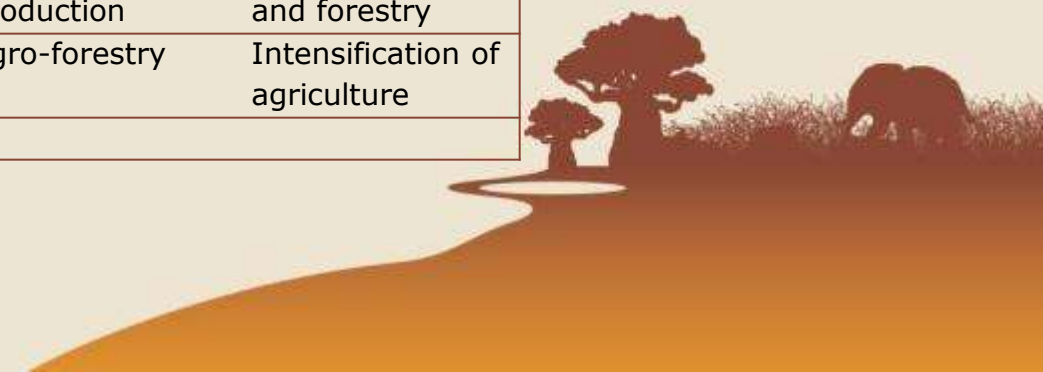


Operational Framework



Sustainable Land Management Interventions

	World Heritage Site	Buffer Zone	Outside Zone
Short term interventions	Prevention of erosion	Erosion control and rehab	Erosion control and rehab
	Fire management	Fire and grazing management	
			Water quality management
	Invasive species control	Invasive species control	Conservation agriculture
	Biodiversity management	Alternative livelihoods	Conservation agriculture
		Wetland rehabilitation	Wetland rehabilitation
Medium term interventions		Fire wood production	Agro-industries and forestry
		Agro-forestry	Intensification of agriculture



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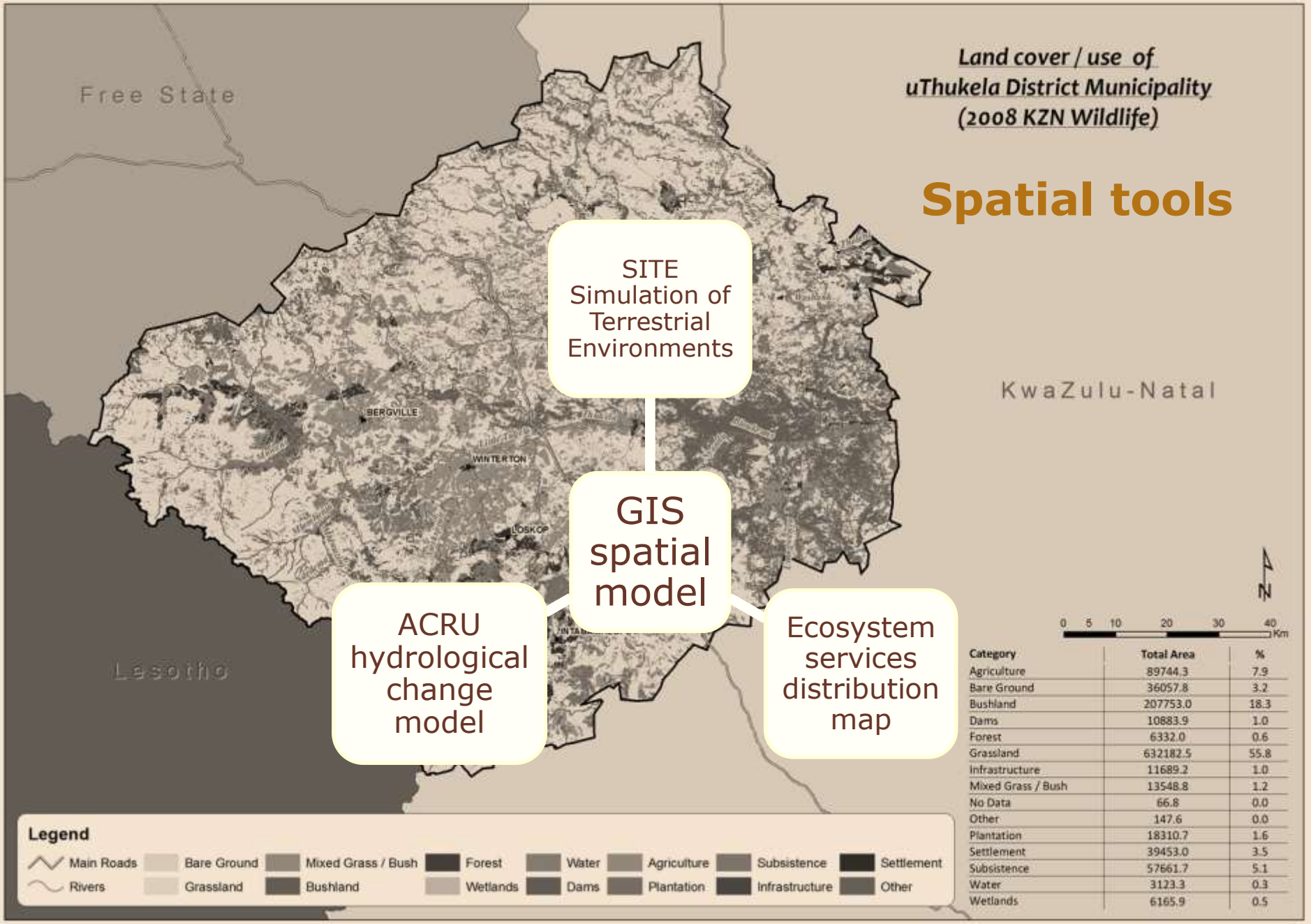
Economic Instruments

- "An economic instrument for managing the environment is a policy or combination of policies that provide financial and other inducements so that users of natural resources pay for the social costs of that use" – *Anderson et al. 2001*

Types of instruments	Examples
Property rights based instruments	Ownership rights Use rights
Price based instruments	Tradable permits Tax differentiation Pollution charges Subsidies Payment for Ecosystem Services
Legal, voluntary and information based instruments	Legal liability Non-compliance charges Environmental certification

Spatial tools

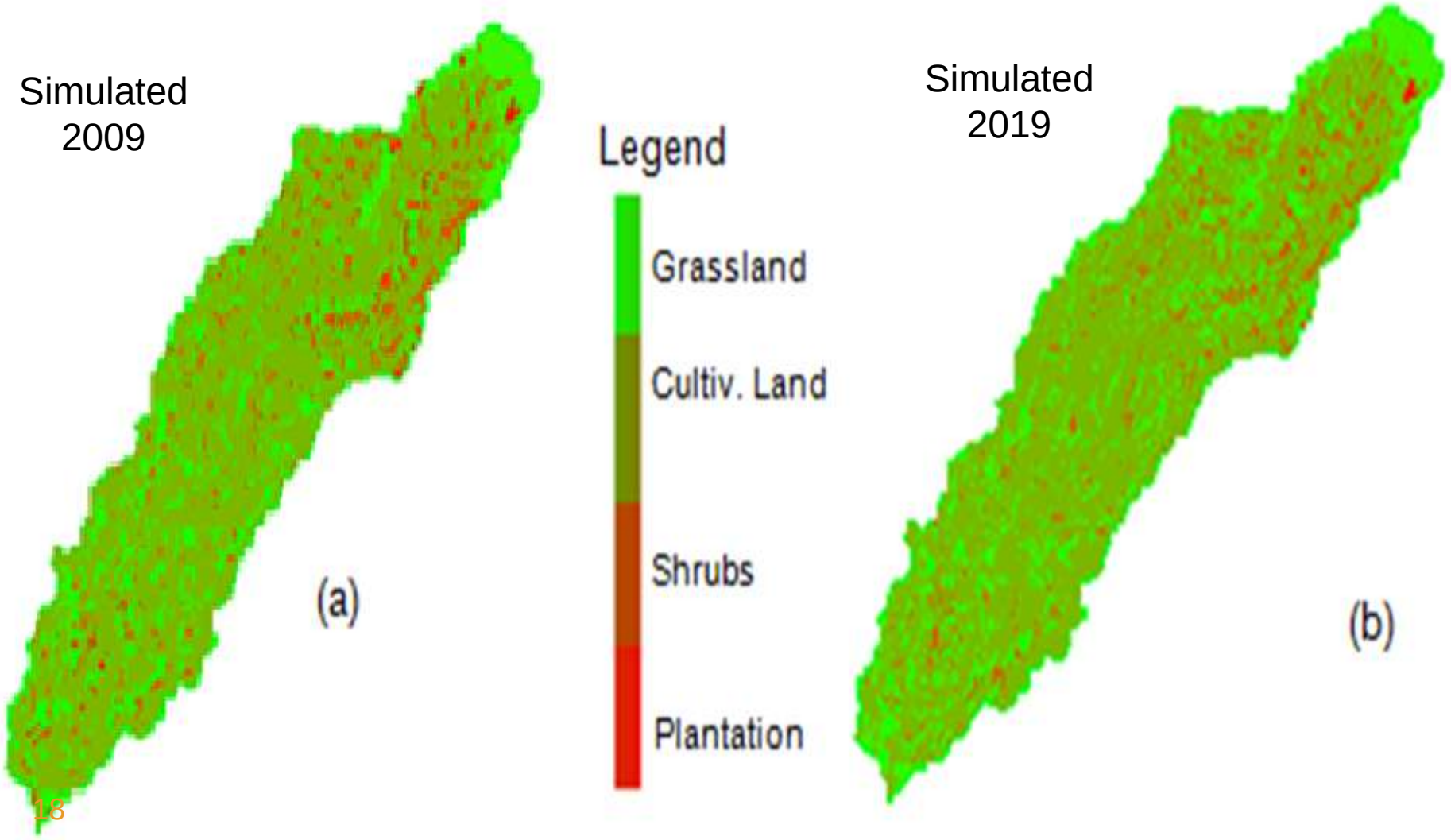


Category	Total Area	%
Agriculture	89744.3	7.9
Bare Ground	36057.8	3.2
Bushland	207753.0	18.3
Dams	10883.9	1.0
Forest	6332.0	0.6
Grassland	632182.5	55.8
Infrastructure	11689.2	1.0
Mixed Grass / Bush	13548.8	1.2
No Data	66.8	0.0
Other	147.6	0.0
Plantation	18310.7	1.6
Settlement	39453.0	3.5
Subsistence	57661.7	5.1
Water	3123.3	0.3
Wetlands	6165.9	0.5

SITE Data requirements

Variable	Description
Socio-economic data	population density, livestock density, average house hold income, literacy level, male/female ratio of household.
Biophysical data	land cover, elevation, slope, soil, woody biomass, agro climatic zones, major crops, current and potential crop yields, roads, rivers, urban centers.
Spatial data	distance to roads, distance to water sources/river, distance to market, distance to towns.

SITE Results



Why the Meso-Scale?

- National and provincial policy is turned into action.
- Planning and development decisions
  - direct impact on land and natural resources.
- Direct interaction between Government and the people
  - opportunity to influence peoples behaviour and actions.
- Mechanisms to achieve integrated planning and action
  - IDP, EMF, Local Economic Development.
- In South Africa the Meso scale is Local Government
  - District Municipalities

Meso-scale Planning & Actions

- Environmental Management Framework (EMF)
  - Compilation of information and maps specifying the attributes of the environment in a particular geographical area to inform:
    - Environmental management, and
    - The consideration of applications for environmental authorizations.
  - EMF has Legal standing – Regulations promulgated by NEMA.
  - Designed to promote co-operative environmental governance.
  - Requires integrated stakeholder participation in setting a Desired Future State (vision).
  - Has a strong spatial focus and outputs.
  - Outcomes include a strategic management plan detailing plans and actions
  - Most NB – required to integrate all sector plans.

Integrating Research with Mesoscale Planning & Actions

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Inception
Planning for integration between projects.

Status Quo
- *WP2 -Baseline Assessment*: Documenting status quo ITO natural resources, socio-economic status, land tenure, INRM issues
- *WP5 - Ecosystem services Mapping*: Ddocument SS and DD of natural resources to highlight links between social, economic and natural systems.
- *WP 6 – Vulnerability assessment:* Highlights influence of Nat Resources on people's well-being.

Desired State
- Develop DS based on understanding from S Quo outcomes (ES, vulnerability.
- *WP7 Participation Game*: Engagement undertaken using SH integration game.
- *WP 6 - SITE model:* Understand implications of different management scenarios.

Strategic Environmental Management Plan
- *WP 5 – Ecosystems services mapping* - informs management zones and guidelines
- *WP 3* **–** *Restoration actions and tools:* to manage/ restore key systems identified.
- *WP 4* **–***Economic instruments*: to create incentive to implement management
- *WP7 – Participation tool:* test strategies

INTEGRATED PUBLIC PARTIICPATION

ENVIRONMENTAL MANAGEMENT FRAMEWORK


Thank you