Reorganization of land use and societal options: the Bushbuckridge wetlands

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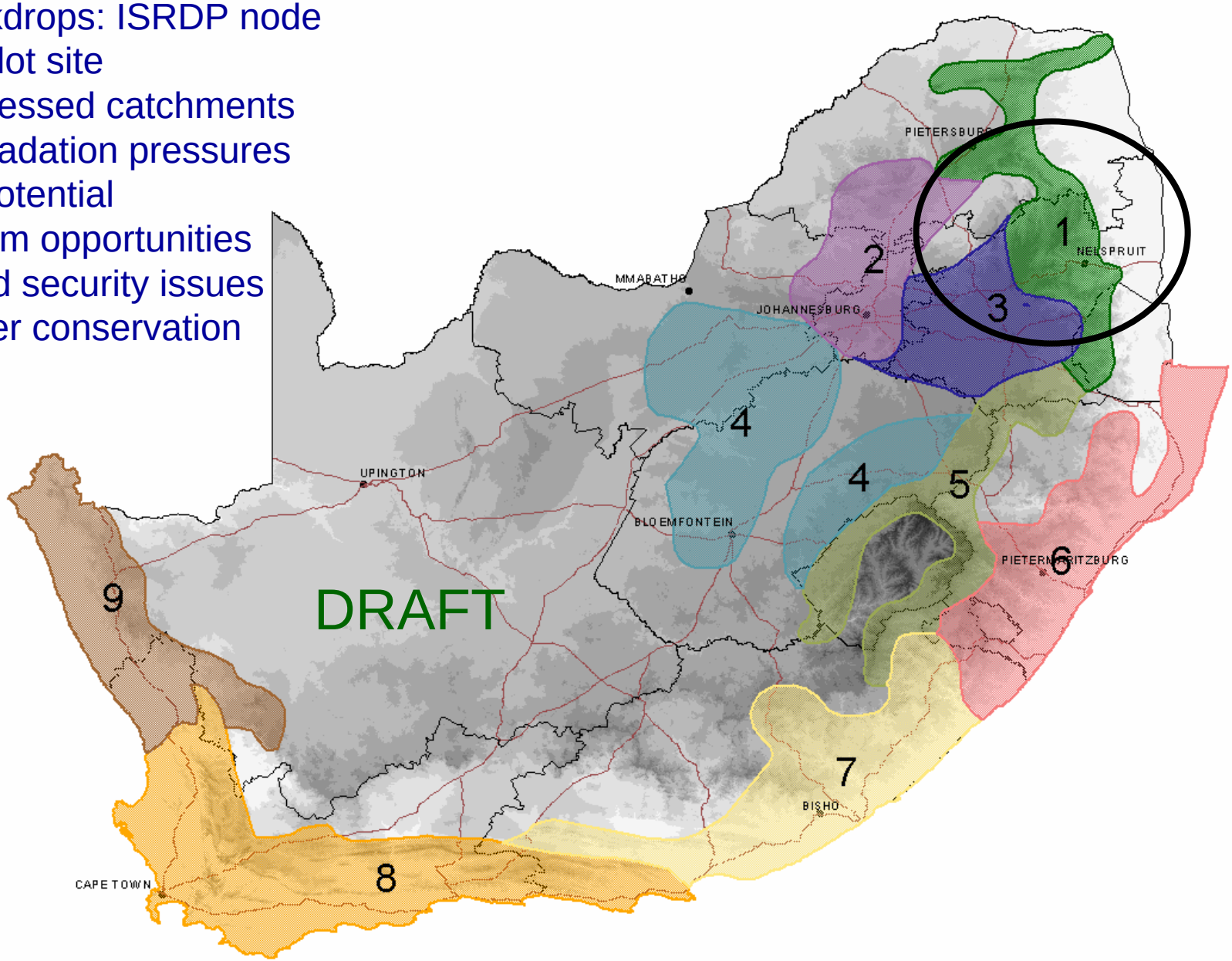
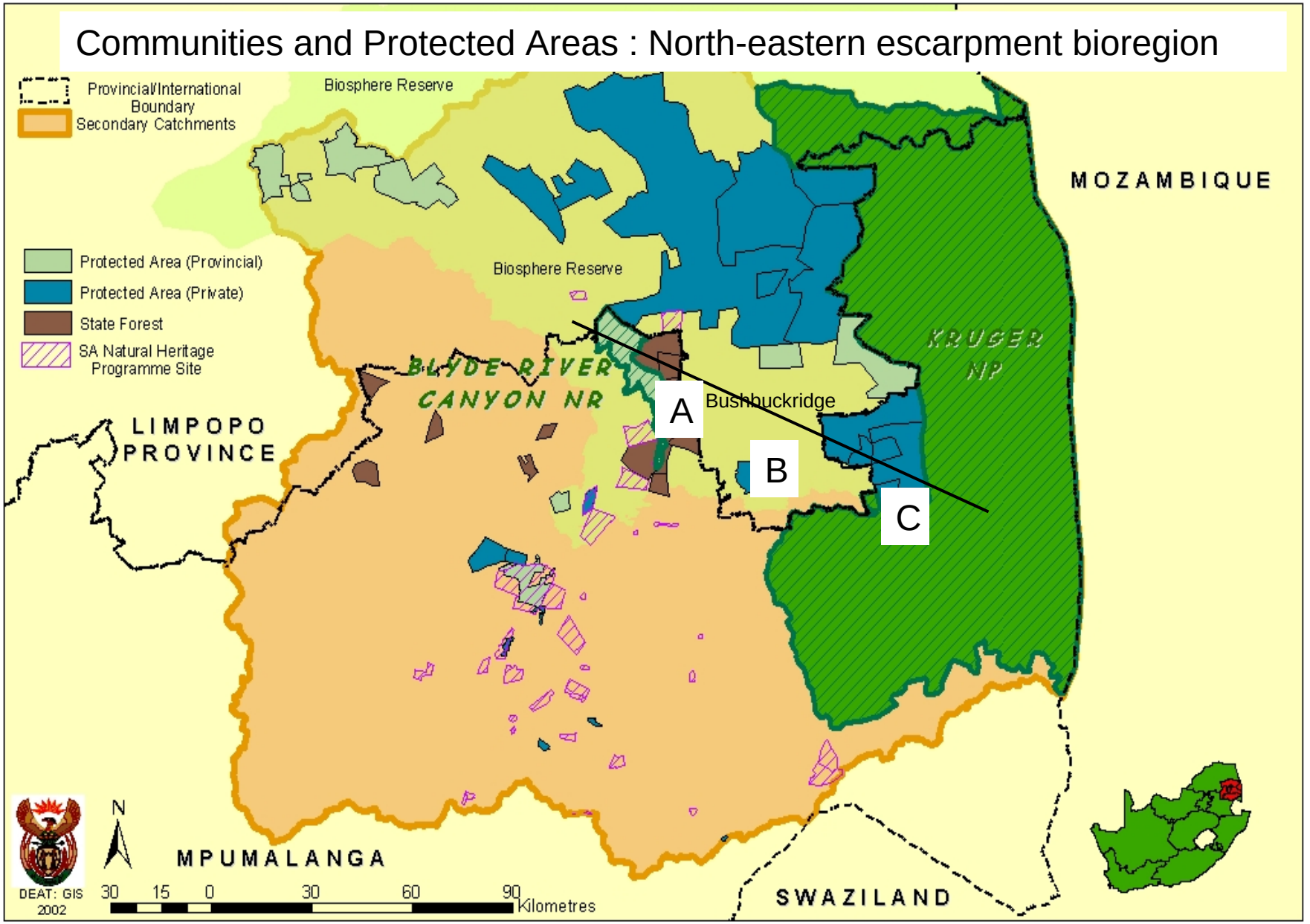
Conceptual and other help from many, incl Dave Cumming, Mark Stafford-Smith, Helen Allison, Duan and Oonsie Biggs, and Chris Clarke (incl. certain graphics).

Funded by the **Water Research Commission**

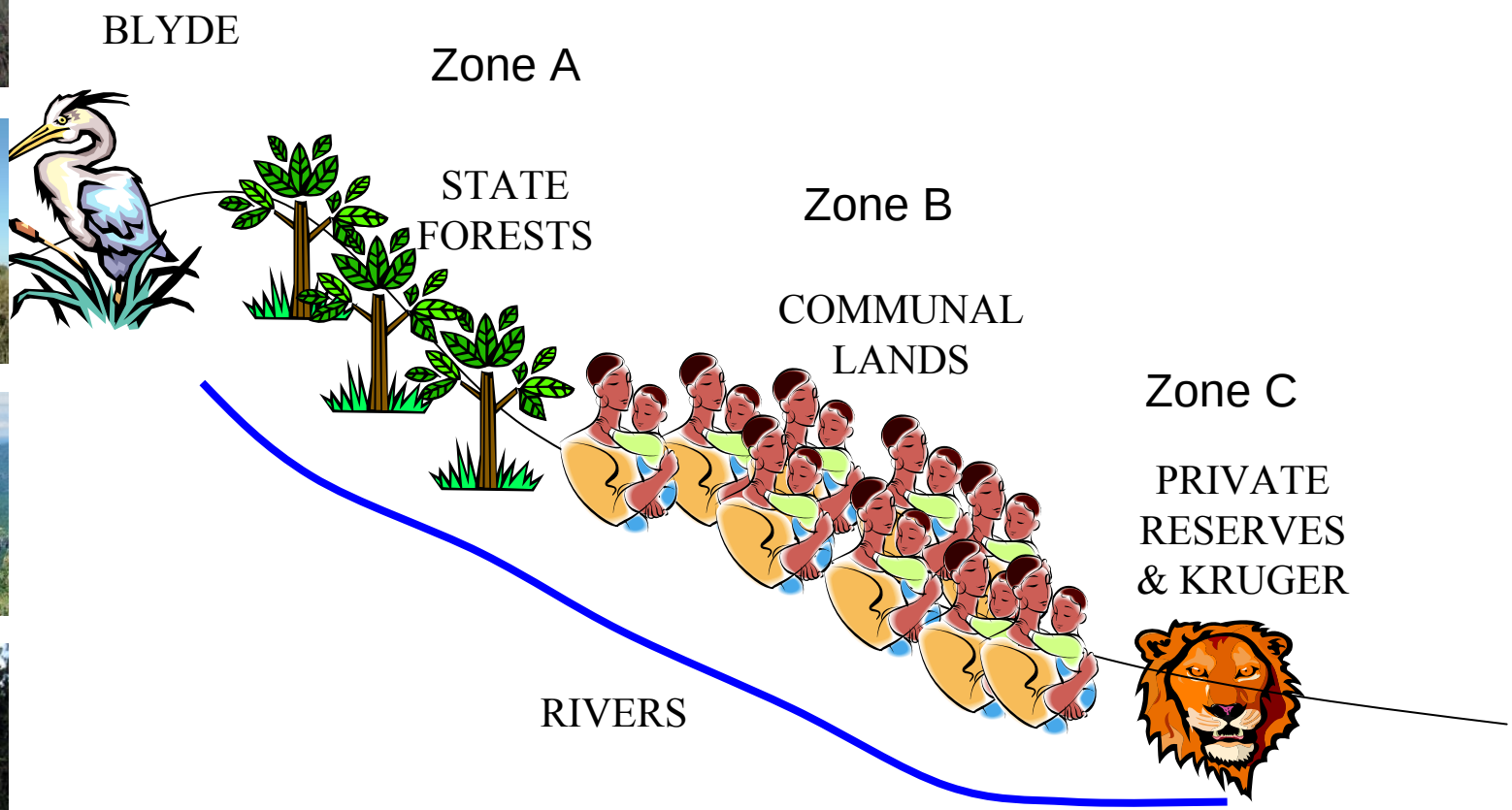
As one backdrop : National biodiversity priority areas

More backdrops: ISRDP node
NEPAD pilot site
Priority stressed catchments
Land degradation pressures
Tourism potential
Land reform opportunities
Water/food security issues
Tranfrontier conservation




Communities and Protected Areas : North-eastern escarpment bioregion
Provincial/International Boundary
Secondary Catchments
Protected Area (Provincial)
Protected Area (Private)
State Forest
SA Natural Heritage Programme Site
Biosphere Reserve
Biosphere Reserve
MOZAMBIQUE
BLYDE RIVER CANYON NR
KRUGER NP
LIMPOPO PROVINCE
A
Bushbuckridge
B
C
MPUMALANGA
SWAZILAND
N
DEAT: GIS 2002
30 15 0 30 60 90
Kilometres

Rural Geography of Apartheid



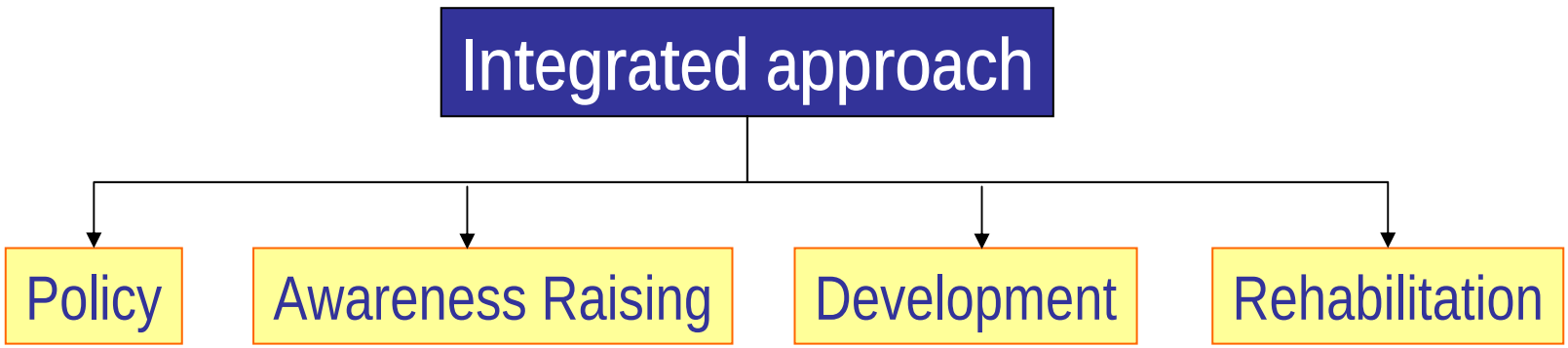
Policy Distortions and Land Restitution

A major incubator of succesful work on human livelihood – environmental linkages in this area has been
The

Save the Sand Programme (SSP) run by AWARD

which has aimed to

address the rehabilitation and sustainability of the Sand River Catchment based on Integrated Catchment Management:



with cornerstones *sustainability, equity and efficiency*

North East Escarpment Bioregion

In summary:

R E S T O R E

(**R**estoration of **E**cosystem

Services for the **T**ransformation

Of **R**ural **E**conomies)

plans to

address the complex set of root causes, drivers, pressures, states and impacts through innovative cross-sector responses

Against this background, we are busy setting up a prototype description of a socio-ecological system to understand its key dynamics w.r.t. sustainability

- It is one of the most densely-populated “rural” areas and adjacent to significant protected areas; the well-being of these relatively poor populations in a mosaiced landscape will materially influence the region’s future.
- It has the benefit of nearly a decade of study and action under SAVE THE SAND. Our focus thus: river services and sustainability, which we believe crucial
- It is in an area with active rehabilitation; and with new conservation expansion (Blyde Nat. Park)
- Surely there are linkages between biophysical and socio-political domains, and between the different land use ownerships and types, that can work more equitably for everyone? (the ‘RESTORE’ idea)





Some basic assumptions to this talk

No-brainer #1 (we believe this one) Systems co-evolve
ecological ← → socio-economic

No-brainer #2 (we question this one) "We have a solution" e.g. "ecotourism (rather than agriculture) will make us wealthy".

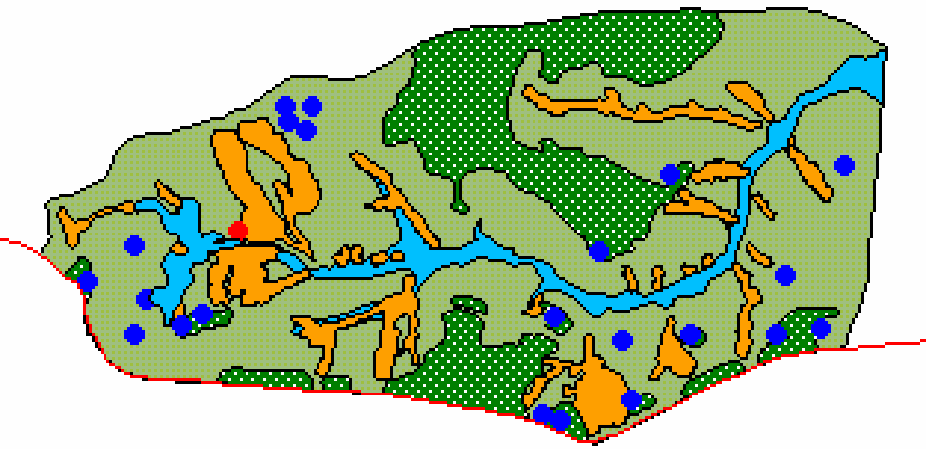
How do we know this (or any other intervention) will build a sustainable socio-ecological system?
i.e.
will it even have the intended effect?
will it be durable?
what about unintended side-effects?

Evaluating all the "solutions" seems overwhelming. Our hope is that formulating the socio-ecological system may contribute to answering the above questions in a handleable way that does not overwhelm us.

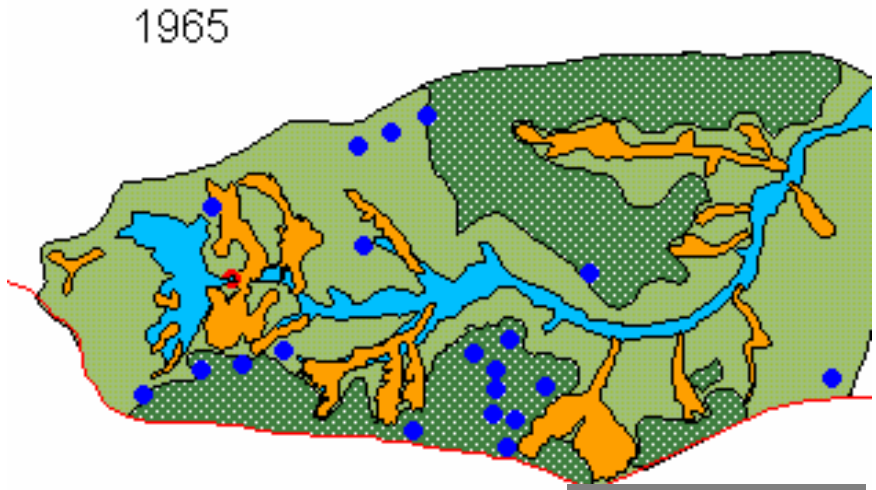
We are trying to get at

Landuse changes in the Manalana micro-catchment of Cragieburn over 20 years

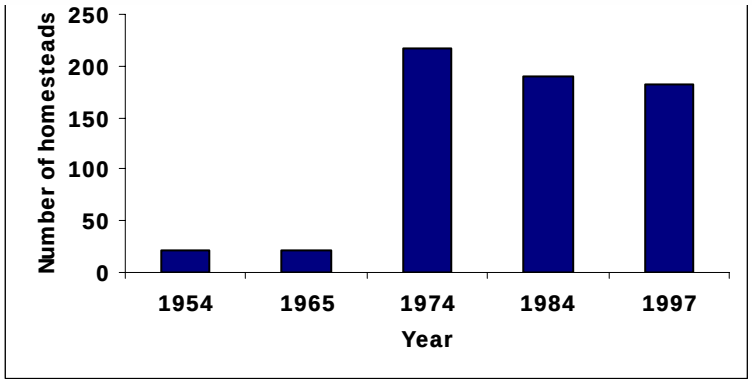
1954



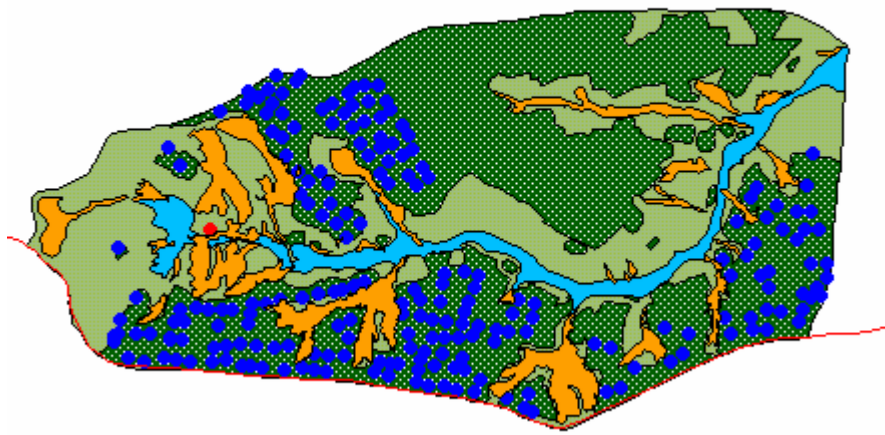
1965



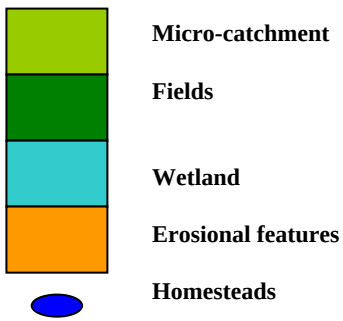
154 people



1974



1519 people



Micro-catchment

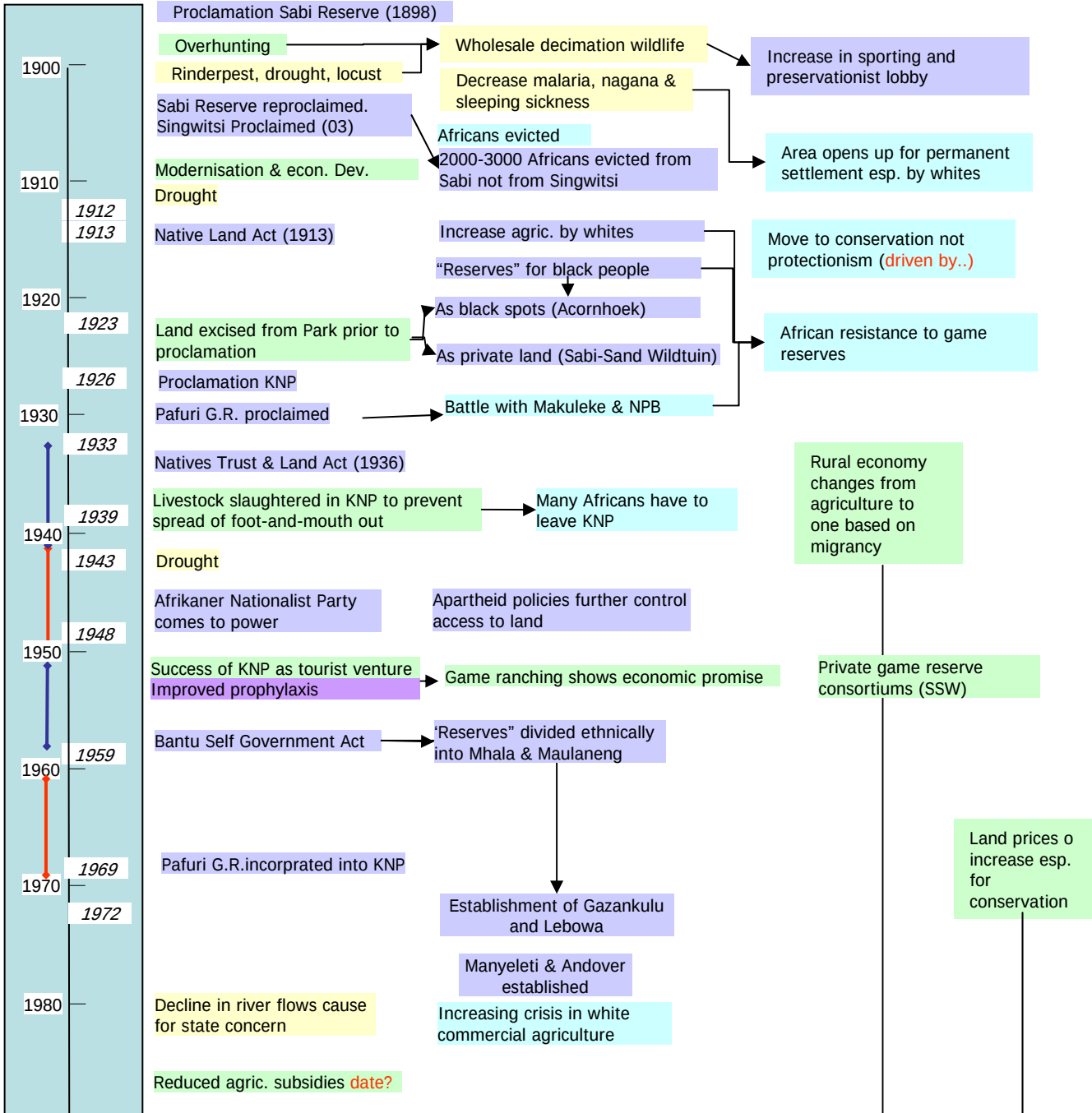
Fields

Wetland

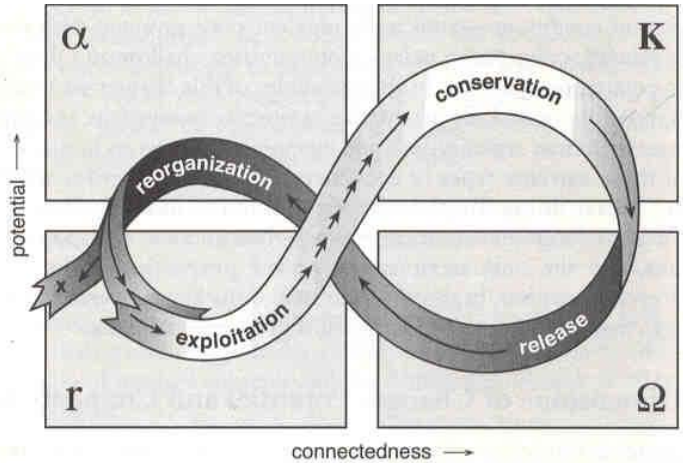
Erosional features

Homesteads

TIMELINE OF MAJOR EVENTS IN ZONE C: 1900 - PRESENT

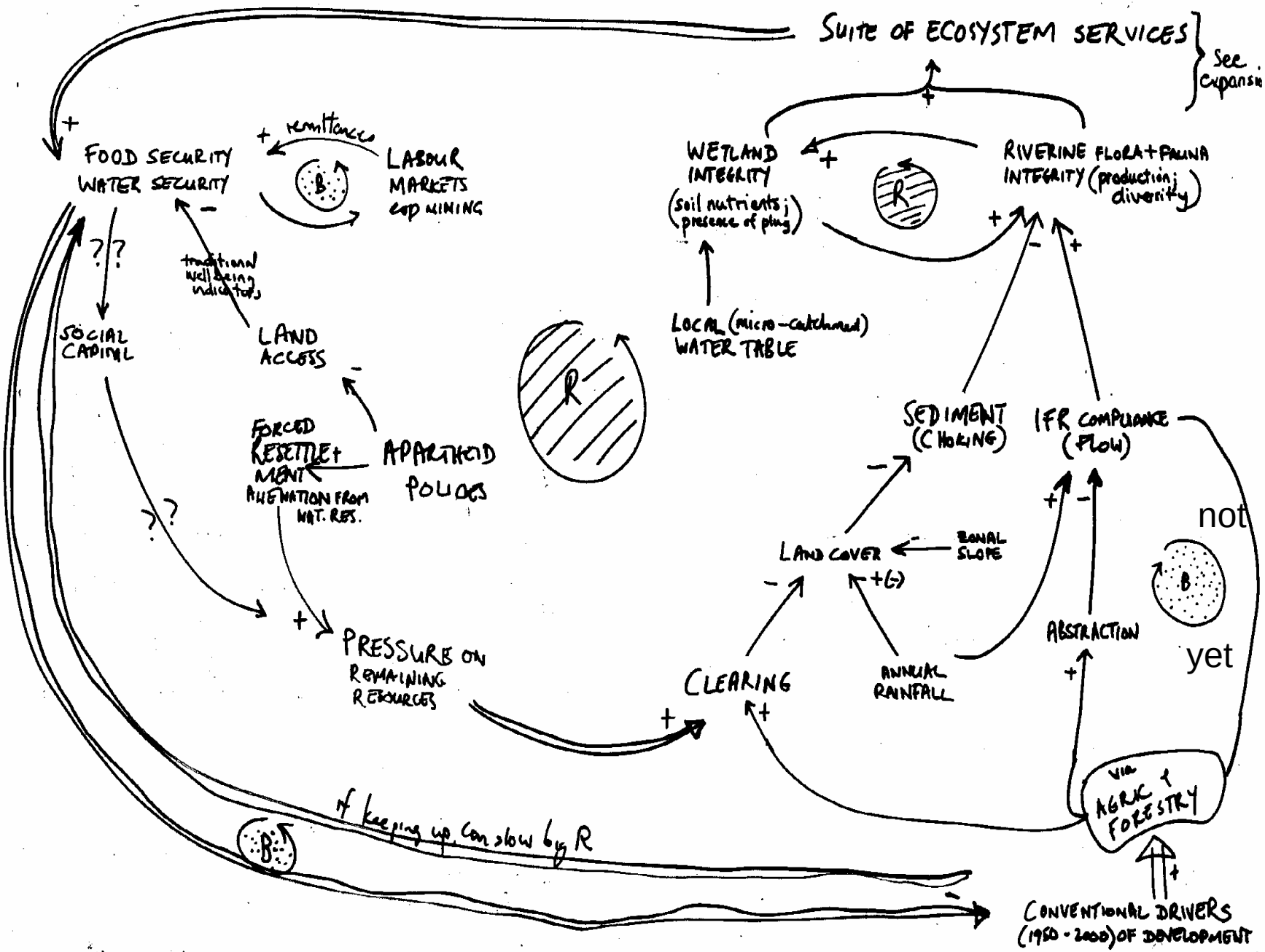


Fitting the loops:

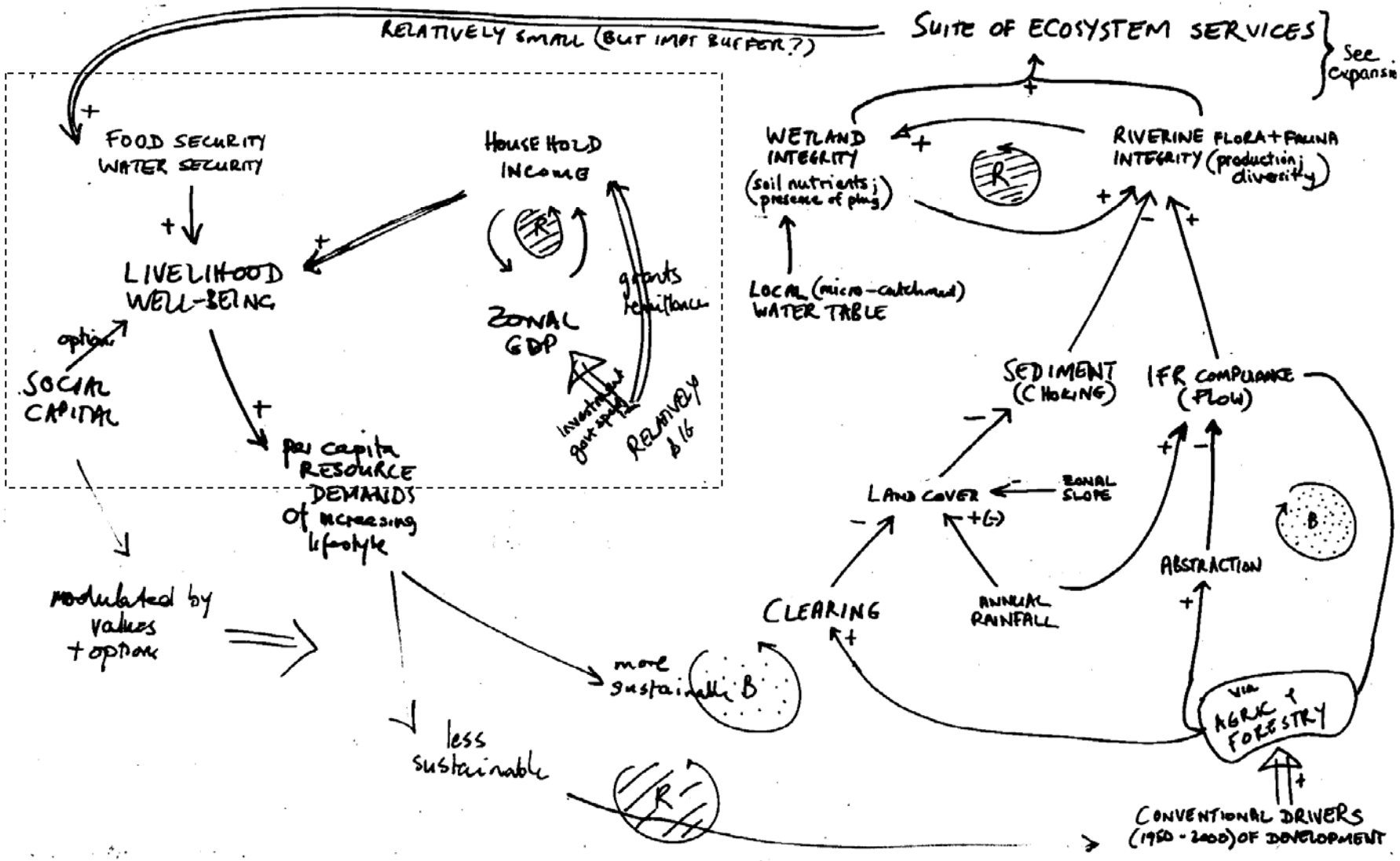


Time periods	Loop	Comment
Circa 1890 - 1913	Ω	***omega phase of release*** (things fall apart) with the prevailing livelihoods collapsing with the advent of immigration of hunters and entrepreneurs.
1914 – 1935	a	Alpha phase, of new ideas being tested, namely labour recruitment plans, Native land Act, Black Reserves. Conditions favourable for permanent white settlement. The 1913 Land Act was fruition of the separate philosophy which came to be the dominant one (of one competing idea over another).
1936 - 1947	R	***r phase*** which is the beginning of the 'conservation' phase, ideas being consolidated.
1948 – circa 1988	K	***K phase consolidation*** of power of the whites under the apartheid regime.
1988 - ? present	Ω	***omega phase – crisis and re- organisation***

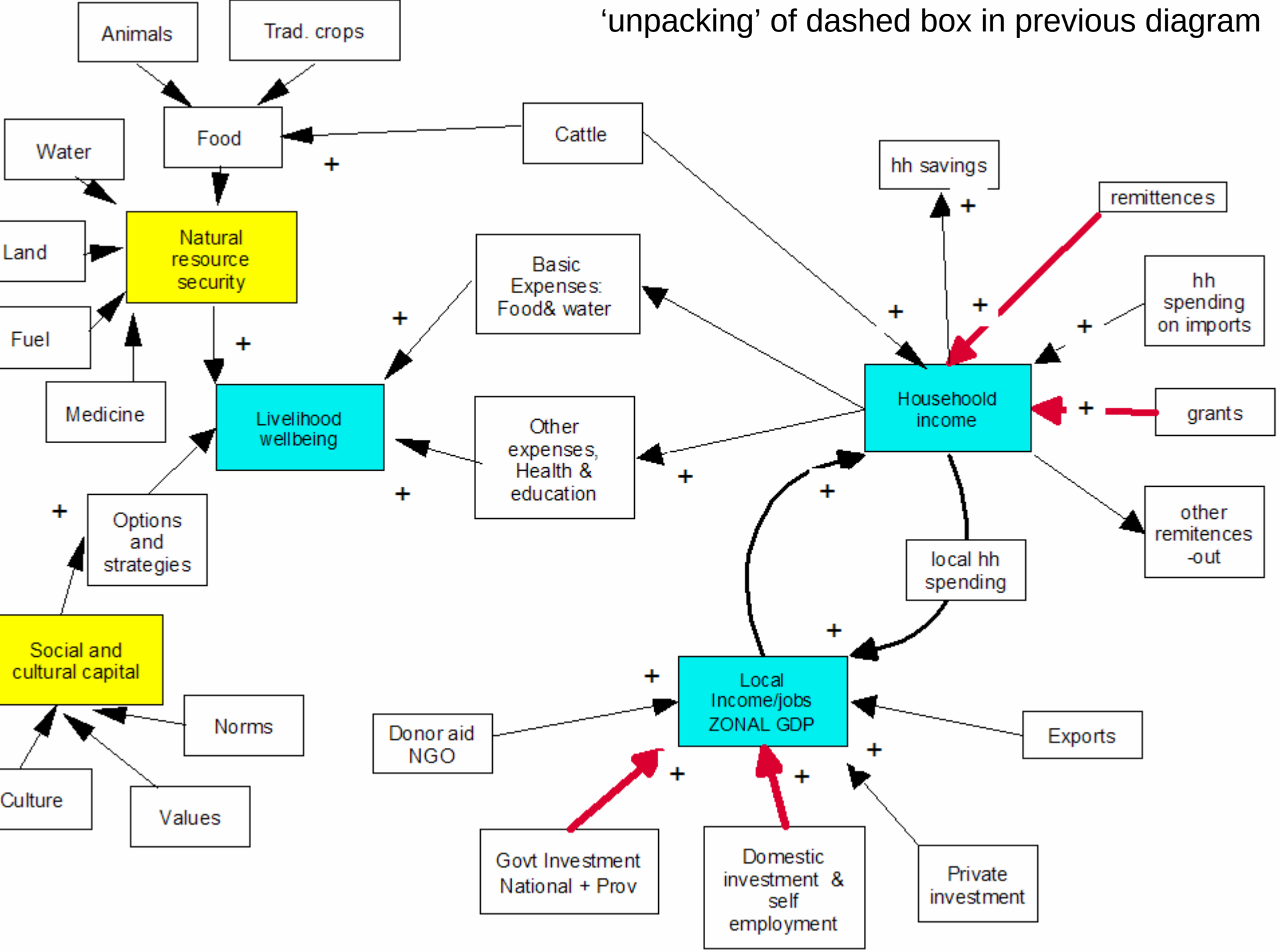
1960s to 1980s Zone B



Understanding of possible first decades of 21st century …..



‘unpacking’ of dashed box in previous diagram



Key questions to start “getting a handle” on sustainability using resilience (R) thinking

Important cross-scale issues e.g.

- National policy X approp scale ecosystem custodianship (-R)
- **Subcontinental herb market X loss of local control (-R)**
- Nested ecotourism scales X improving local capacity to offer (+R)

Governance:

- Parochial proxies in apartheid (-R)
- **Current “barrage” of well-intended policy reform: key ones in area are water, educational, social welfare (+ or – R; + will require good mgt)**
- National, prov and local nesting and appropriate spans (maybe +R)

Conflict/Power in user groups:

- well-documented conflict in apartheid era eg. post “betterment” (-R)
- Current patchy conflict e.g. civics vs. traditionals (-R but small)
- **Co-operative governance ethic in SA constitution, if expressed (+R)**

Key questions to get at sustainability (…2)

Mental models:

- Linear thinking, hydraulic mission (-R)
- Now some complexity thinking (+R)
- **Apathy, blame and 'stripping' (-R)**

Alternative states:

- **Obvious resource degradation (but how serious, how important and how reversible?). Wetland "plugs"; erosion ←→ sedimentation; flow reduction; drought 'disturbance'**
- Questions around socio-political state changes. Apartheid dvpt phased in and out; still a legacy.
- Demography incl HIV/AIDS effects and urbanisation as state changes; education (as leading variable to increase social capacity)

Key questions to get at sustainability (…3)

Fast and Slow variables:

- Key slow - Sedimentation and flow regimes (-). Asymptoted?
  - Natural capital attrition? (reducing ecosystem service buffer) (-)
  - **Education (social capacity) especially a quality issue (-, trying for +)**
  - Capacity to deal with ecotourism (+)
  - National economic fundamentals (+)
- Fast variables which should not be misread:
  - Seasonal rainfall, Annual tourism & labour demand, **student enrolments**

Sources of leadership and learning: Education, plus:

- Number of NGOs, **number of effective inter-sectoral initiatives (+)**

- Prototype projects recognising mosaiced interdependencies in landscape (?)

Redundancy:

-**Multiple catchment interest groups (+)**

-Extent of overlap in function between institutional layers

-Savanna robustness based on multiple functional plant types (+)

-Alternative water resourcing strategies (+)

Conclusions to date

- Figures-of-8 moderately helpful (in our hands), list of innovative resilience questions more so. System dynamics very engaging.
- ‘Data-rich’ backdrop turns out still fairly poor, esp. for trends longer than 50-30y (biophys) and 15-10y (social)
- Therefore need to depend on ‘expert’ opinions of likely direction and meaning longer-term trends
- These same folk and a wider group should then be involved in scenario generation and responses, based on the common (or at least ‘mosaiced’) understanding of the “way the world works”. This will help us decide what the most ‘objective’ view is of the state of the system, likely trajectories and ways to influence sustainability

- So: we have partly managed to bring social, economic and biophysical into a comparative integrated domain. Question which keeps arising from audiences is *whether this is really new thinking or just a tool for ‘buy-in’.*

  Answer depends on fundamental notions, we think both.

Thank you