1st March 2007
London

Can the Savanna Resources of Southern Africa be the Basis for Sustainable Development?

Dr Jeremy Woods
Southern African Savannas Network

1. Defining 'Sustainability' and 'Savannas'.
2. Resources
3. Resource Use
4. Conclusions: constraints & opportunities

jeremy.woods@imperial.ac.uk : ICEPT/, Exhibition Road, London, SW7 2AZ www.savannas.net

The Network – on an Edinburgh Savanna!

Taken 19th September 2003- Edinburgh Botanical Gardens

The Southern African Savanna Network

Network funded by:
EU (INCO), SCOPE, UNEP and ICSU

Soils:	CNR (Italy) CSIC (Spain)	Traditional Resource Use:	UFH (RSA), UND (RSA)
Water:	RU (RSA), UB (Bots)	Commercial Resource Use:	UB (Bots)
Veget^{n}:	IC (UK)	Wildlife / Biodiversity:	IUCN (Zim) CEF (Moz)
Human:	WSU (USA) /	UoOslo – Siri Erikson	

Aim of Presentation

To provide an overview of the network's understanding of the current status of the sustainability of the use of the savannas in the region and the biophysical resources upon which that use is dependent. Based on a detailed assessment of four countries: Botswana, Mozambique, South Africa and Zimbabwe

Definitions:
- 'Sustainability'
- 'Savanna'

Current Status of SASN

Funding:
EU (1st Oct 1998 to Sep 2001)
SCOPE / UNEP (Feb 2000 to Mar 2001)
ICSU / SCOPE (Mar 03 to ….)

- Links with the SAVI network

‘Sustainability’

‘Strong Sustainability’:
Stocks of capital are NOT substitutable

Sustainability viewed from 3 perspectives:

1. Environmental
   - Biodiversity, climate change, resilience
2. Economic
   - If not equivalent to GDP then what?
   - System profitability / what discount rate?
3. Social
   - Again not GDP
   - Some measure of ‘welfare’?
   - Development of human capital / MDGs?

See also: Pearce, Ekins, Hamilton and Constanza.

Environmental Sustainability

How to quantify the stocks of natural capital?

1. Biodiversity
   - Wildlife numbers, floristics
2. Indicators
   - Of human, animal and / or ecosystem welfare
   - Number and/or scale of protected areas
   - Severe climatic events
   - Levels of soil-C and nutrients
   - NPP
   - Yields
3. The timeline needed to monitor the dynamics of these indicators is often too long to fit into economic or political cycles (e.g. 10+ years)
4. 'Value change at the margins'… Pearce

Economic Sustainability

How to quantify the stocks of economic capital?

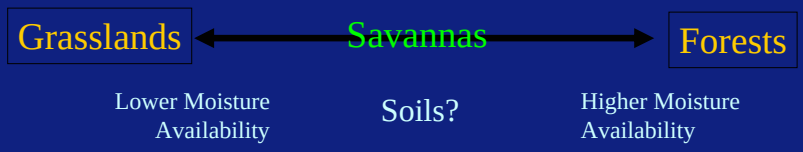
1. Profitability
   - IRR, NPV, company survival, etc
   - GDP, GNP, gGNP
2. Monetary Incentives
   - Particularly for protecting biodiversity – see Hachileka (2003) on CBNRM returns.
3. The Role of Discounting i.e. the human preference for reward now rather than later
   - Discounts the future: 5% = 20 years; 20% = 5 years.

‘Social Sustainability’

How to quantify the stocks of human capital?

1. Indicators?
   - Access to water, education, food, etc. e.g. the MDGs
   - Institutional capacity
2. Changing Understanding
   - Constanza (2002) – welfare versus wealth (happiness)
3. Valuing ecosystem services
   - Direct and indirect use values (Watson, 2003).

‘Savannas’ of Southern Africa



Disturbance Factors

1. Fire
2. Browsing and Grazing
3. Agriculture
4. Wildlife utilization
5. Water exploitation
6. Climate (high winds, storms, temperature…)

Defining Savannas

Shackleton (2000) proposes that within the South African context, 'savannas' or 'wood-lands' are synonymous' and are defined as follows:

The term savanna, or woodland, refers to a suite of tropical and subtropical vegetation types in which fire-adapted, co-dominant, continuous or discontinuous herbaceous and largely deciduous woody strata of indigenous plants, experience markedly seasonal growth patterns and processes in relation to the seasonal delivery of precipitation, which occurs during hot summers, followed by cooler, but warm, dry winters. Generally, the herbaceous stratum is dominated by C4 grasses and sedges, but this, and the overall cover of the woody and herbaceous strata, may be temporarily altered by a range of disturbance phenomena.

e.g. Savannas are:

- Grasslands with trees to
- Woodlands with grass

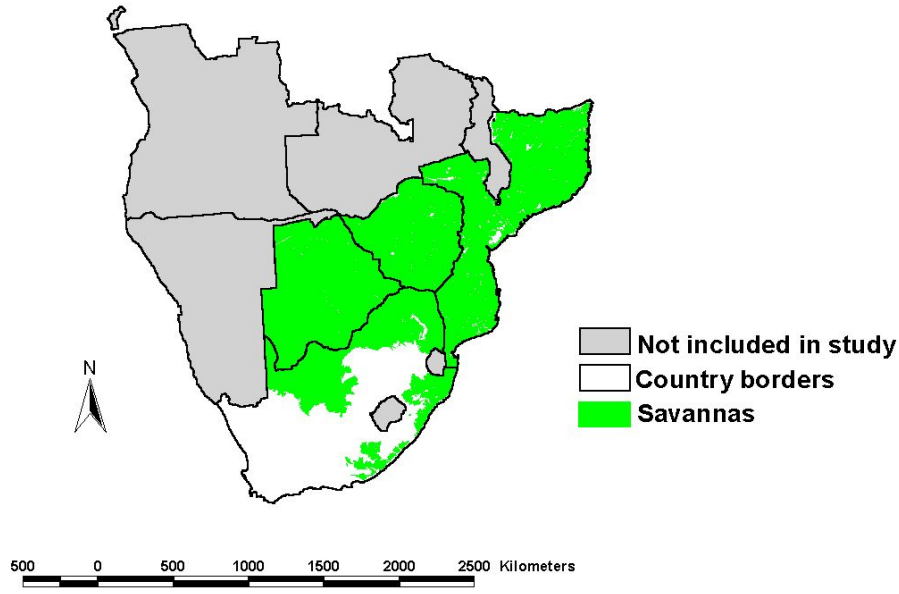
Defining Savannas Cont'd

For GIS, the Scholes and Hall (1996) definition of savannas i.e.:

any area with '*10 to 50% cover by woody plants and a well-developed grass layer*'

- see also House and Hall, 2001.

In the light of this conference there is clearly a need to re-visit the whole issue of definitions if a globally accepted definition can (or should?) be adopted!



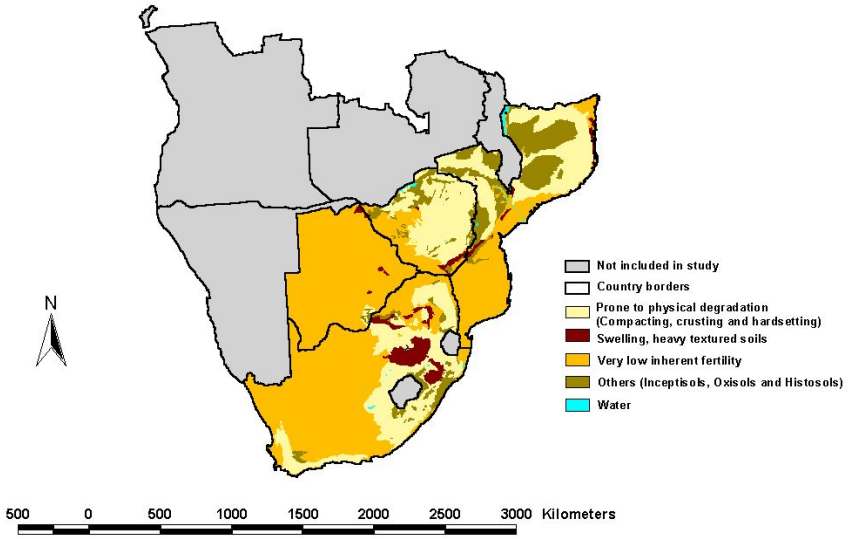
Source: M. du Plessis in Woods & Sekhwela, 2003

Savanna Resources

What are the fundamental bio-physical resources that savanna development is dependent on?

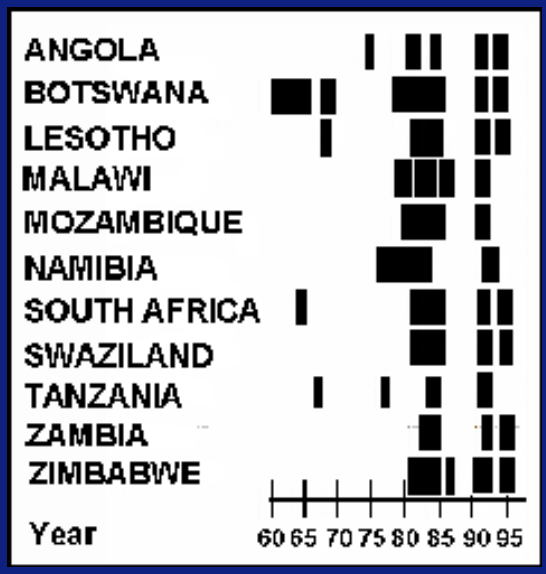
1. Soils
   - Ristori and D'Aqui (this conf + SAGJ 2003)
2. Water
   - Du Plessis & Rowntree (2003) – SAGJ and Network Rpts
   - Donald Kgathi to continue the work
3. Vegetation
   - Woods & Sekhwela (2003)
4. Human / Institutional
   - Beebe (SAGJ, 2003 and now links with SAVI netwk)

Soils



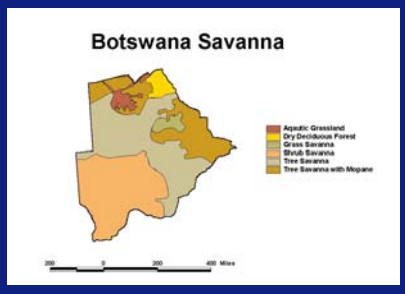
Ristori, D'Aqui and Du Plessis, 2003

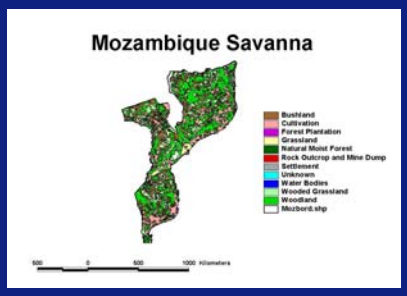
Water- are droughts getting more severe?

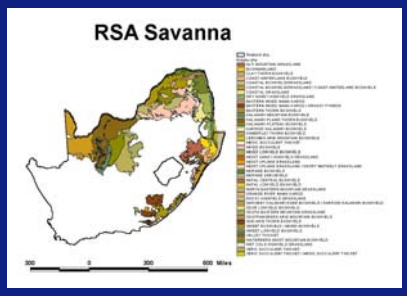


In Du Plessis & Rowntree, 2003

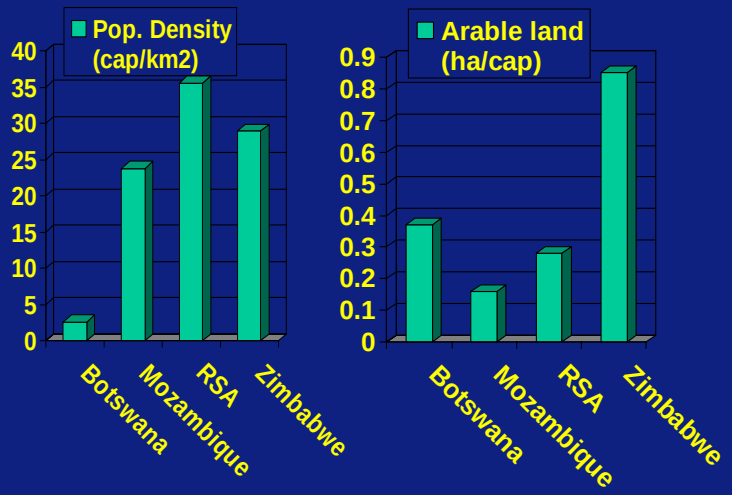
Vegetation







Human – population density & arable land



Savanna Resource Use

What are the options for the sustainable exploitation of savanna resources?

1. Traditional Agriculture & Direct Use of Savanna Products
   - Fraser & Mabusela (SAGJ, 2003) and;
   - Watson & Dlamini (SAGJ, 2003)
2. Commercial Agriculture & Forestry
   - Kgathi & Sekwela (SAGJ, 2003)
   - Sekhwela & Kgathi (SAGJ, 2003)
3. Wildlife
   - Hachileka (SAGJ, 2003)

Key Points – Summary & Conclusions

1. Identify critical long term trends in the resource base
   - Changing balance between C3 & C4 species
   - Decreasing rainfall and increasing frequency and duration of droughts
   - Decreasing fallow cycle, increasing elephant numbers (decreasing lion populations) in some areas…
2. Highlight the site-specific nature of existing and future resource use options
   - Soil, climate, population density and land use differ markedly
   - In addition, existing practices and policies differ markedly too!

Summary & Conclusions Cont'd…

3. Highlight the need for flexible 'evidence-based' policy development targeted at the needs of local people
   - Continued monitoring critical
   - E.g. does CBNRM protect biodiversity?
   - Can traditional farming ever be sustainable on the crusting arenosols of Botswana and Zimbabwe?
4. Which developmental options:
   - Lock local people into unsustainable patterns of resource exploitation?
   - Cause dislocated markets to exploit natural resources without paying the full costs of that expoitation e.g. charcoal production, indigenous medicine collection, mopane worm collection – for urban markets?

Summary & Conclusions Cont'd…

5. Support existing government policies based on sustainability critiera
   - Mozambique world-leader in sustainable policy development- but does it have the monitoring to ensure sustainability and support?
6. Where next for the network:
   - Need to develop our capacity to understand and quantify the resource base using GIS
   - Collaborate with policy development researchers and NGOs to understand:
     - Needs of local people
     - Develop our work to provide the answers that ensure successful evidence-based sustainable policy development.

Thank you from:

www.savannas.net