MIOMBO ECOREGION AND THE MIOMBO NETWORK

BY MIOMBO NETWORK

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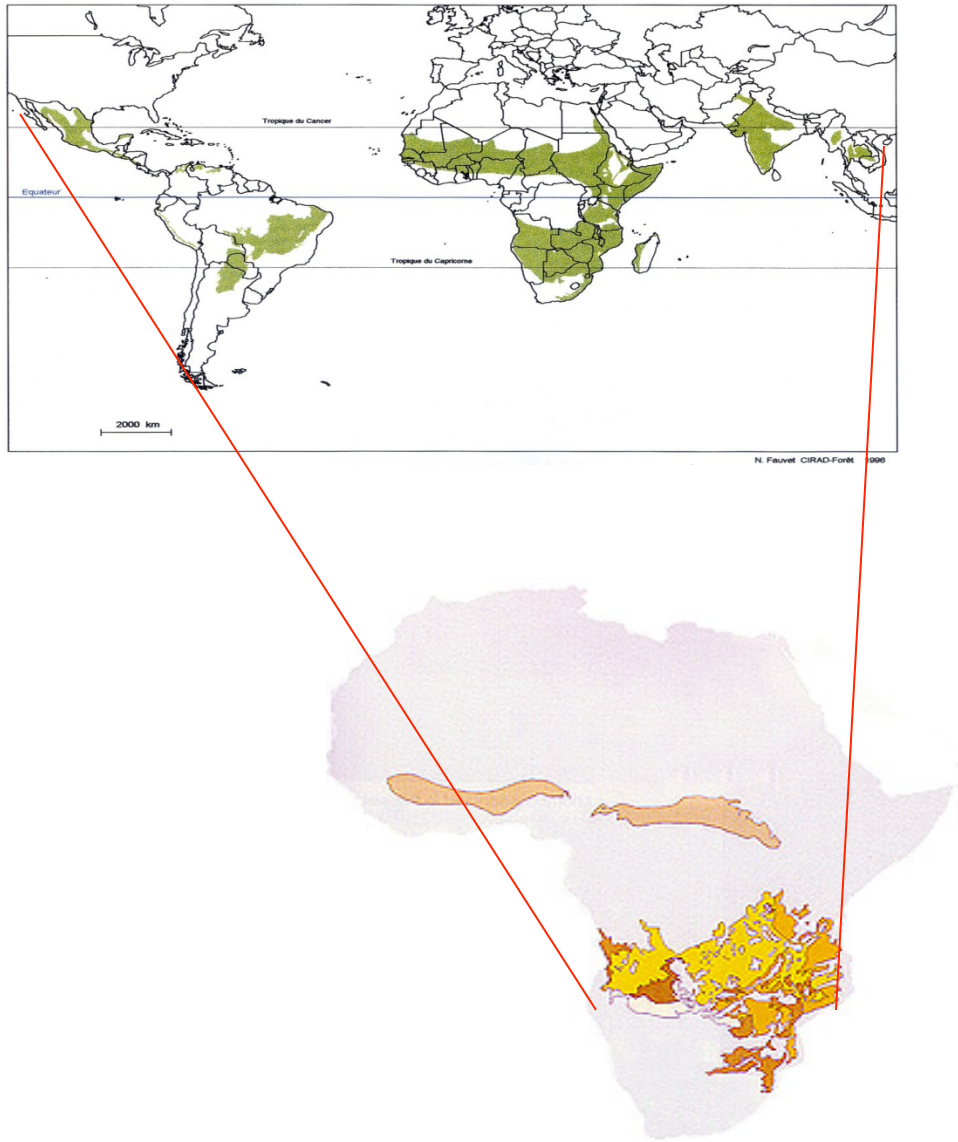
PRESENTATION OUTLINE

- Introduction
- Characteristics of the miombo ecoregion
- Miombo utilization and forest cover change
- Causes of forest degradation
- Restoration potential
- Management of the miombo ecoregion
- Miombo Network and its role in the ecoregion

MIOMBO ECOREGION: INTRODUCTION

- The largest dry ecosystem in the World;
- Over 3.6 million km$^{2;}$
- Most extensive dry forest type in Southern Africa;
- Across Angola, Namibia, Zambia, Zimbabwe, Botswana, Mozambique, Malawi, Tanzania, DRC & Part of South Africa.



CHARACTERISTICS OF MIOMBO ECOREGION

- Divided into major vegetation types (Table 1);
- Subdivisions reflects the species composition;
- **Miombo is the major vegetation formation in the region**

Table 1. Vegetation types in the ME

Vegetation	Size in Sq. Km
Acacia/Combretum	103, 887
Afromontane	98,685
Baikaiea	260,171
Burkea/Terminalia	96,162
Cryptosepalum	37,908
Miombo woodland	**2,572,708**
Mopane	384,037

CHARACTERISTICS OF MIOMBO ECOREGION

Vegetation	Major species
Munga/Combretum	*Vachelia* & *Combretum* species
Afromontane	*Parinari excelsa, Podocarpus milanjianus, & Rapanea* spp.,
Baikaiea	*Baikaiea plurijuga*
Burkea/Terminalia	*Burkea africana* & *Terminalia* species
Cryptosepalum	*Cryptosepalum pseudotaxus*
Miombo woodland	*Brachystegia, Julbernadia* & *Isoberlinia* species
Mopane	*Colophospermum mopane*

CHARACTERISTICS OF MIOMBO ECOREGION

MIOMBO UTILIZATION AND LAND COVER CHANGE

- Key role at social, economic and environmental levels

Supports livelihoods of > 100 million people

MIOMBO UTILIZATION AND LAND COVER CHANGE

- Provision of food security e.g. fish, caterpillars, game meat, fruits

CAUSES OF WOODLAND DEGRADATION IN THE ECOREGION

- Agriculture
- Fires
- Charcoal production
- Mining
- Timber harvesting

CHARCOAL PRODUCTION

- Charcoal, a prime source of wood energy for the urban majority;

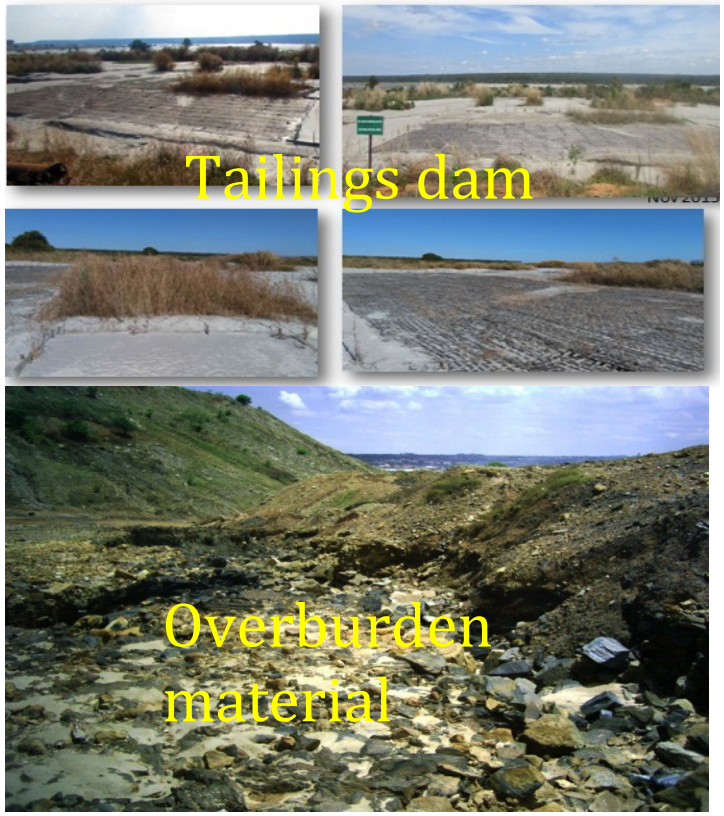
- Percentage of the national energy budgets varies:
  - From 76% in Zambia to 91% in Tanzania (Nyembele 2011)
  - Charcoal represent important source of income & employment
    - 78,000 jobs (Zambia) & 92, 800 (Malawi) depend on charcoal
    - Tanzania, 75% rural poor derive cash income from the charcoal industry (Malimbwi and Zahabu, 2007)
    - Mozambique, 65.4% rural poor derive cash income from the charcoal industry (Mugo and Ong 2006)

CHARCOAL PRODUCTION

- Often results in degradation of woodlands/forests;
- Form mosaics of
  - Regrowth stands and
  - Mature woodland

CAUSES OF WOODLAND DEGRADATION IN THE ECOREGION

- Mining
  - For example, copperbelt alone in Zambia
  - 9,125 ha of wasteland
    - contains 791 million tons of tailings
  - and 20,146 ha
    - Contain 1,899 million tons of overburden materials



DEGRADATION AND IMPACT

- Forest cover change from year to year

Country	Total forest cover 2005 (000 ha)	Annual change rate			
		1990-2000		2000-2005	
		(000 ha/yr)	%/yr	(000 ha/yr)	%/yr
Angola	59 104	-125	-0.2	-125	-0.2
Malawi	34 02	-33	-0.9	-33	-0.9
Mozambique	19 262	-50	-0.3	-50	-0.3
Tanzania	35 257	-412	-1.0	-412	-1.1
Zambia	42 452	-445	-0.9	-445	-1.0
Zimbabwe	17 540	-313	-1.5	-313	-1.7

DEGRADATION AND IMPACT ON CARBON

- Downward trend in carbon stocks

Country	Carbon stock in living forest biomass (10^6 Mg)				Annual changes (10^3 Mg yr^{-1})		
	1990	2000	2005	2010	1990-2000	2000-2005	2005-2010
Angola	4 573	4 479	4 432	4 385	-9	-9	-9
Malawi	173	159	151	144	-1	-2	-1
Mozambique	1 878	1 782	1 733	1 692	-10	-10	-8
Zimbabwe	697	594	543	492	-10	-10	-10
Zambia	2 579	2 497	2 457	2 416	-8	-8	-8

RESTORATION POTENTIAL OF THE ECOREGION

- Among the most resilient ecosystems
  - Recovers fast after:
    - Agriculture
    - Charcoal production
    - Timber harvesting

Most species of roots and stumps

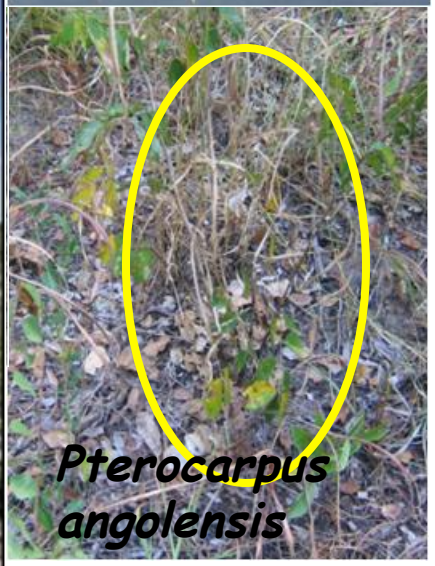
Growth rate and Growth rings

- *Brachystegia floribunda* discs from charcoal an slash & burn regrowth stand with clear ring; rings not clear with mature woodland stem

RESTORATION POTENTIAL OF THE ECOREGION

- Extension and socio-ecological relevance make them:
  - Key elements in offsetting climate change effects
  - An important repository of carbon-fast growth ((18-24 PgC carbon; Ryan et al., 2016)

Most Miombo woodland species persist on site through vegetative regrowth from root stocks & cut stems



MANAGEMENT OF MIOMBO ECOREGION

- Sustainable management of miombo viewed as alternative pathways:
  - REDD+ Initiative regionally
  - Upon consideration of socio economic & political issues

SOME KEY ISSUES AND QUESTIONS

- What ability do our woodlands/dry forests have through coppicing to respond to harvesting? Are the current disturbances within their limits or beyond them?

- What are the long-term impacts of repeated fires on dry forest/woodland regeneration and reproduction?

- How is land tenure impacting woodland management and utilization across the region?

SOME KEY ISSUES AND QUESTIONS

- There is need to develop NWFP specific inventory and monitoring schemes?
- How can we harmonize natural resources management in the region?
- What are the long term impacts of community use of woodlands to support their livelihoods.

MANAGEMENT OF MIOMBO ECOREGION

- A specific call within context of the SADC Forest Program;
- Data and information on:
  - indigenous forests;
  - Land cover assessments; Forest Inventory
  - Fire;
  - Valuation of forest sector contribution to national economies, and
  - Restoration models for miombo

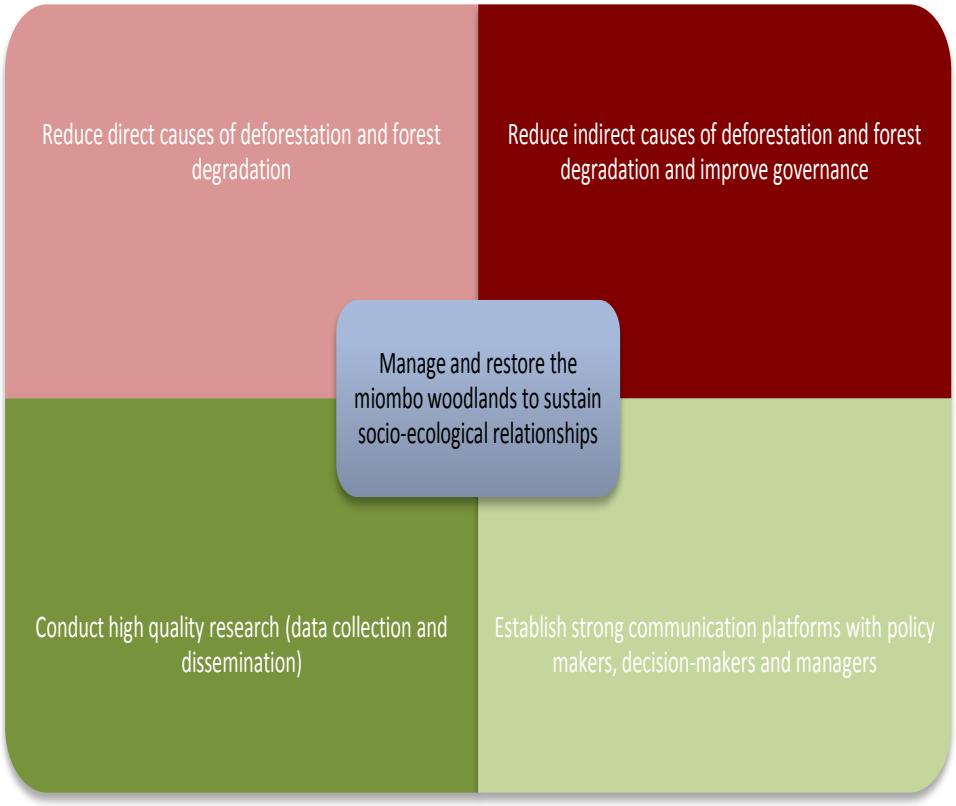


Figure 2. Conceptual Framework for the Miombo Network action.

Objectives of the network

1. To enhance the use of information from field observations and remote sensing of the miombo cover for management in southern Africa.
2. To execute and design projects, develop consensus algorithms and methodologies for product generation and validation
3. To bring together land cover data providers, users and researchers operating in a common geographic area, and represent a link between national agencies, user groups and the global user/producer.

Membership database

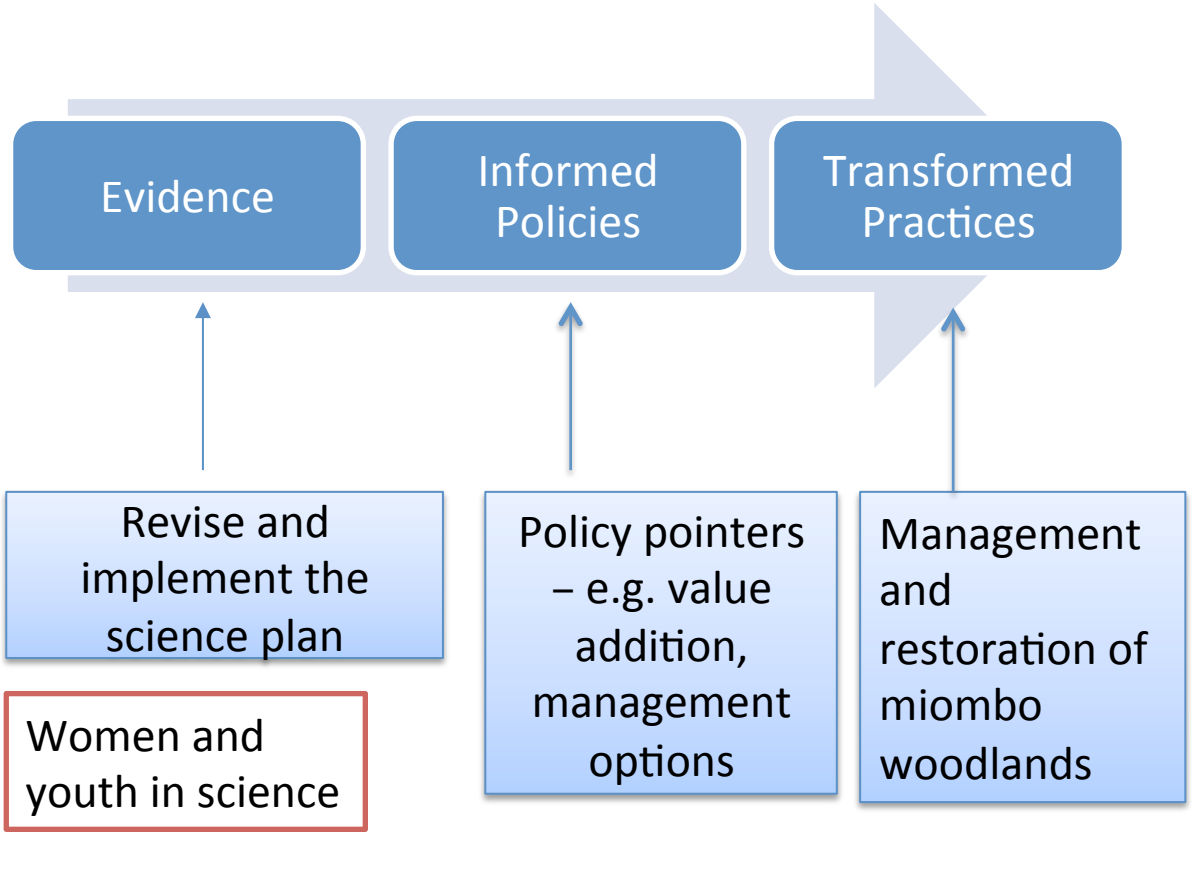
- More than 100 people listed (MW countries, USA, UK, Portugal, Brasil, New Zealand, others).

- 60% are from academia, 26% from conservation NGOs and/or institutions, 8% from private sector and 4% from government institutions.

=> good capacity for training and capacity building within the network.

It is all about miombo forests and people
People need healthy and functional miombo
- Ecosystems services (timber, water, food…)

Cease climate change mitigation and adaptation opportunities – e.g. REDD+, Bonn Challenge



Leveraging **Finance** and Convening Power

Individual Decision Making and Collective Action
GO, NGOs, Private sector
Communities
Researchers
Investors

Identified flagship projects

- Analysis of the legal and policy framework for miombo woodlands.
- An integrated approach to maximize the use NTFP and to improve agricultural systems in the Miombo woodlands (submitted to the African Union)
- Develop a restoration strategy for the region, which includes geospatial analysis of miombo degradation, identification of restoration models and priorities per country and land cover type and identification of implementation strategies.
- Impact of migration due to climate change on miombo woodlands.
- SEOSAW, collate and analize existing plot data

MN Science Plan

Focal Area 1: Patterns and rates of land cover change.

Focal area 2: Land use change integrated analysis: Process and drivers of land use change

Focal area 3: Carbon and biomass in the miombo woodlaands

Focal area 4: Ecology of the miombo ecosystem

Focal areas 5: Miombo ecosystem management and adaptation to climate change

Focal area 6: Socio-ecological relationships in the miombo ecosystem

Miombo Book Project

- Update of the Miombo book published in 1996.
- The book should focus on global changes and Miombo woodland ecology.
- Issues to consider: (i) target audience (decision-making and practitioners); (ii) outline of the book, including the relevant chapters; (iii) funding opportunities and authorships.

- Challenges:
  - The network works on a volunteer base
  - No funding secured
  - Institutionalization is needed
  - Engaging members
  - Proactivity of the members

First Policy brief

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December 2016

POLICY BRIEF

Using & restoring the Miombo woodlands: needs for an integrated and holistic approach in ecosystem management for long term sustainability

Policy decisions made now about how to develop the Miombo region of Africa will have far-reaching consequences for the people living in this region and for the

Socio-ecological relationships in Miombo woodlands

Miombo Woodlands are the *Julbernardia/Brachystegia* dominated

https://www.iucn.org/news/forests/201702/roadmap-protect-miombo-woodlands

- A mailing list:

miombo-network@mlist.is.ed.ac.uk

joluci2000@yahoo.com

(Natasha Ribeiro)

- Website:

http://www.fao.org/GTOS/gofc-gold/net-Miombo.html