MIOMBO NETWORK OF SOUTHERN AFRICA: FIRE ASSESSMENT AND MANAGEMENT IN MIOMBO WOODLANDS

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(MN steering Committee)

2nd GWIS AND GOFC GOLD FIRE IT MEETING
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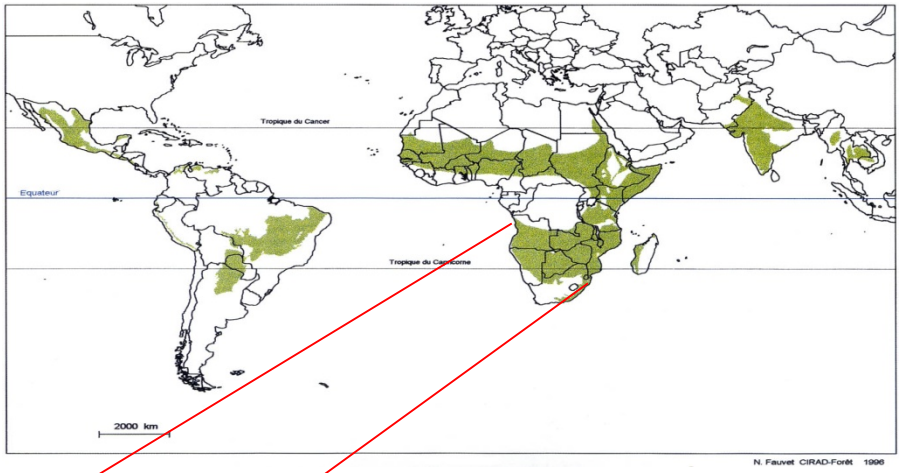
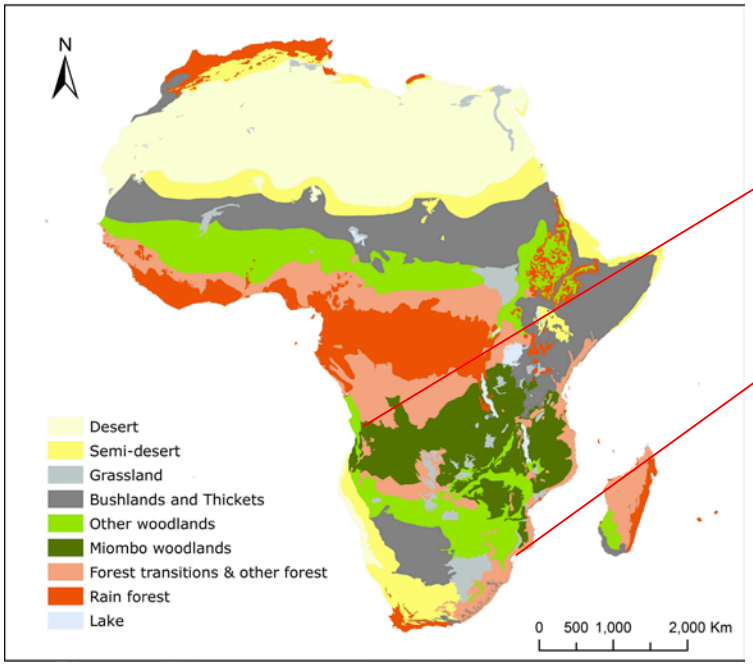
Miombo woodlands





- The largest dry forest ecosystem
- Occupies about 2.7 million km^2 in Southern Africa across 7 countries (Mozambique, Malawi, Tanzania, Zimbabwe, Zambia, Angola and DRC)

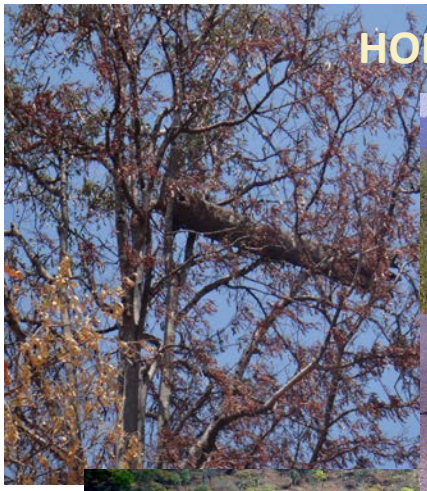
Sources: http:// www.fao.org/DOCREP/005/W4442E/w4442e04.htm http://mediasfrance.org/Reseau/Lettre/10/en/Dossiers/

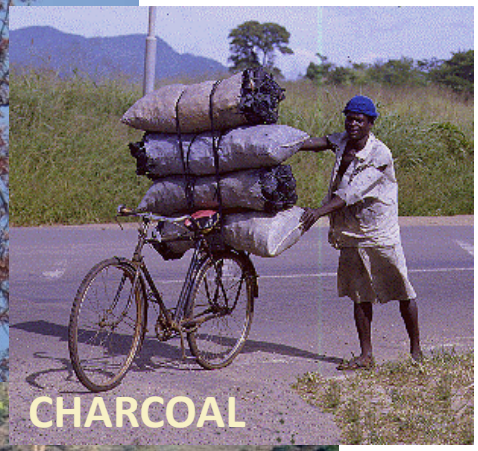
Miombo Woodlands: ecologically and socially important

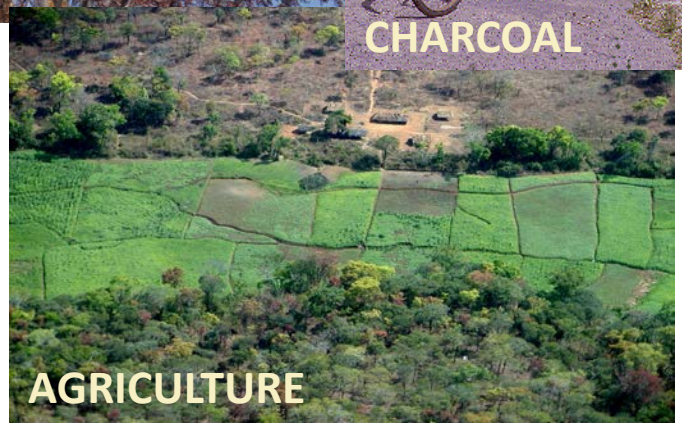
- about 8500 plant species, half are endemic of the region.
- dominated by: *Julbernardia globiflora, Brachystegia spp. and Isoberlinia angolensis*
- Frequent fires and other disturbances (herbivory, slash and burn)

Provide goods and services for 39 million rural people and 15 million urban dwellers

Intrinsic relationships between people and the woodlands







Goods and Services from the woodlands

- Timber industry in Mozambique was worth $330.3 million in 2011 (UT-REDD, 2016).

- 76% of energy used in the region is derived from the woodlands; Traded woodfuels have an annual value of $780 M (Ryan et al., 2016).

- Medicinal or therapeutic plants and products in Southern Africa are estimated to yield US$ 150 million/year although some of the harvesting methods are unsustainable (Syampugani et al., 2009).

- Woodlands store 18-24 PgC carbon (Ryan et al., 2016).

Fire is part of Miombo ecology

Grass fuels in the understory burn every 2-3 years

Cold fires

Hot fires

Tall miombo

Shrub miombo

Current State of Fire Management

90% of fires resulting from human activities => emphasis to education & awereness and community engagement.

Most legislation prohibits fire, but recognizes the need for prescribed burning as a management tool.

Relevant government sectors expected to handle fire information and community training (e.g. Forest Services in TZ, MW and National Disaster Management Institute, Moz).

Private sector to implement specific FMS.

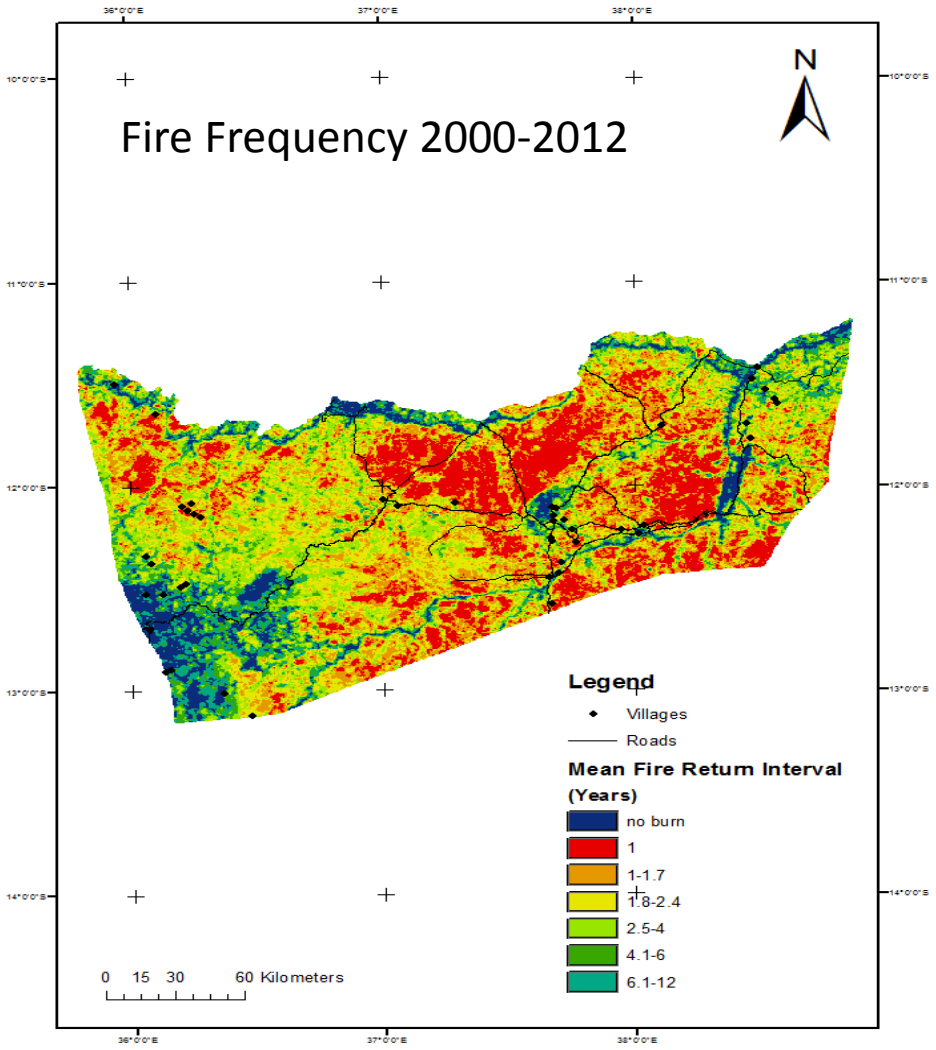
Current State of Fire Management

- Long-term fire experiments in savannas/MW are rare, given the difficulties and demands of operation.

$\Rightarrow$ Knowledge about fire regimes, impacts and management options is still incipient.

- Impact of fire on vegetation is being analysed in some areas in the MW e.g. Zambia (Trapnell, 1959; Chidumayo, 1997); in Zimbabwe (Furley et al 2008); Mozambique (Ribeiro et al., 2017); Tanzania (Mariki, 2016); Malawi (Roy et al 2005).

Mapping fire frequency in Niassa National Reserve, Mozambique



(Ribeiro et al. *in press*)

- Combination of MODIS burned area and active fire products.
- Mean Fire Return Interval: 3.29 year (average for the region).
- 45% of the areas burn annually (**northern and eastern NNR**).
- Fire Season: Jul-Oct, peaking in September

Fire Experiments: Case of Zimbabwe Furley et al 2008

- Studies on tree growth in miombo woodlands indicate that the plots burned at three- and four-year intervals recovered to greater mean heights than the unburned control plots. There was no significant variation between treatments, suggesting that the few trees that did survive in the frequently burned plots were large specimens.
- Brachystegia and Julbernadia dominated the plots throughout and after the experiment.
- By the end of the experiment some grass and sedge species had flourished while others revealed greater susceptibility to fire, and fire-tolerant species predominated in the most frequently burned areas.

Fire Experiment: Case of Zimbabwe Furley et al 2008

- The experimental design appeared to cope well with the variability between plots and indicated the soundness of the initial design and its implementation.

- Basal area and stocking density were highest in the four-yearly burned plots but there was a high variability throughout the experiment, suggesting that many trees may have attained heights and bark thicknesses sufficient to protect from fire damage.

- Fire also affected the composition of the herbaceous plant community, but not the number of species.

Main Challenges

Research

Development of knowledge in an hollistic manner such as:

- •fire regime, behaviour and ecology under specific ecological conditions;
- •development of fire prediction models as well as associated fire impact and fire severity;
- •Recover traditional knowledge on fire management.

Management

- •Information access, archiving and, dissemination and sharing;
- •Coordination among sectors;
- •Engaging local communities in fire management

Needs Identified as a Pre-requisite for Improving Fire Management

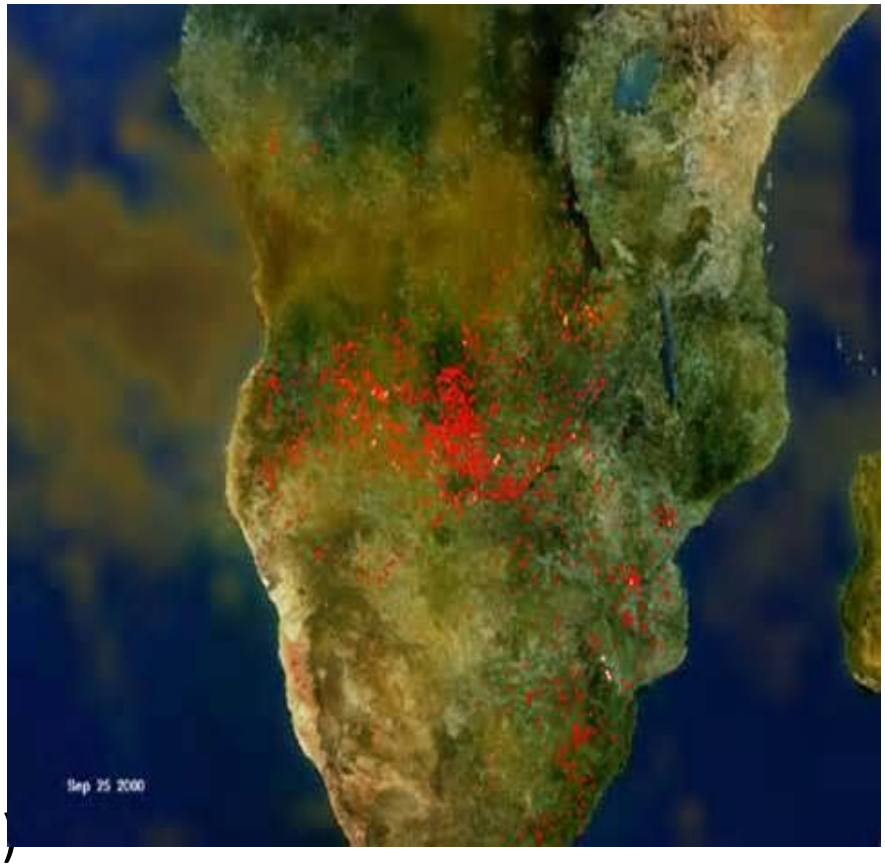
Near-real time fire information for key areas (Conservation areas, concessions, etc) through AFIS, MESA, etc.;

Knowledge about FDR in most key areas;

Information on fire regimes and impacts on ecosystems (e.g. Niassa National Reserve)

Define priority areas for fire management (those with higher fire frequency and intensity and where impacts are seen)

Investment in human resources at local level (capacity building, equipment, etc)



Role of the Miombo Network

- One of the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) Regional Networks;

- **Objectives:**

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.

On going Collaborative Projects

- Analysis of the regional legal and policy framework for miombo woodlands (**on-going**).

- An integrated approach to maximize the use of NTFP and to improve agricultural systems in the Miombo woodlands (**submitted to the African Union**) – **Considering Fire is the main management tool**

- Socio-Ecological Observatory of SA Woodlands (SEOSAW), collate and analyse existing plot data in the Miombo woodlands and associated woodlands (**on-going**)

Dissemination of Information

- Policy Briefs (1 on MW restoration produced, 2 in pipeline)


Miombo Network

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

- Scientific publications (Furley et al., 2008; Ribeiro et al., 2017; Miombo Book Project).
- Support decision-makers (FMP of NNR; Mpingo Conservation and Development Initiative in Tz).
- Scientific meetings (2013, 2016; reports available)

THANK YOU