



MIOMBO /SAF NETWORK

Judith Kamoto, Natasha Ribeiro, Navashni Govender

MN/SAFNeT Steering Committee Members

5th GWIS and GOFC-GOLD Fire IT Meeting

21-23 June 2022

STRESA, ITALY

Miombo Network Vision & Mission

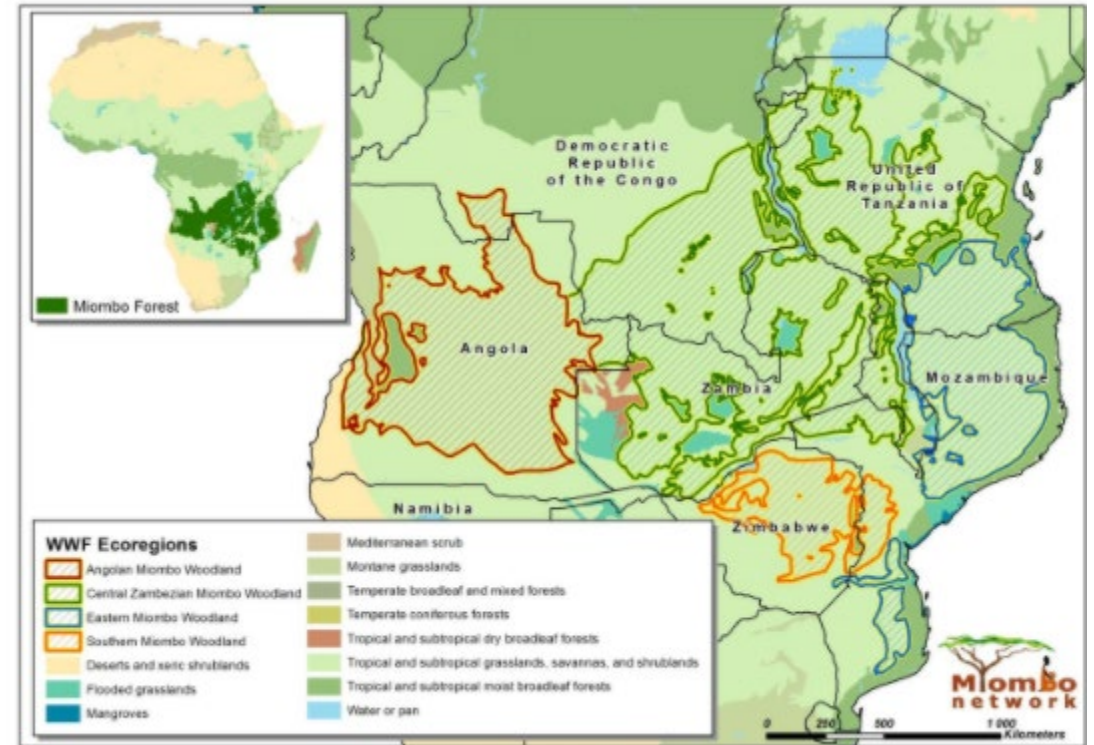
Miombo Network is an organisation dedicated to providing scientific information and policy guidance for a better future of the Miombo forests across their range countries. We conduct research and policy analysis aiming at improving the benefits and human livelihoods from miombo forest ecosystem.

Our Vision

A resilient and sustainable miombo ecosystem that provides both tangible and intangible benefits to empowered and thriving communities

Our Mission

Promoting sustainable management of the Miombo Woodlands in Southern Africa



What we do:



Communicates Evidence-Based Scientific Information

Communicates evidence-base scientific information about Miombo Forests to improve management and enhance positive human-miombo forest relationships that ...



Conducts Policy Analysis To Provide Policy Advise.

Conducts policy analysis to provide policy advise to improve conservation and management of miombo forests within individual ...

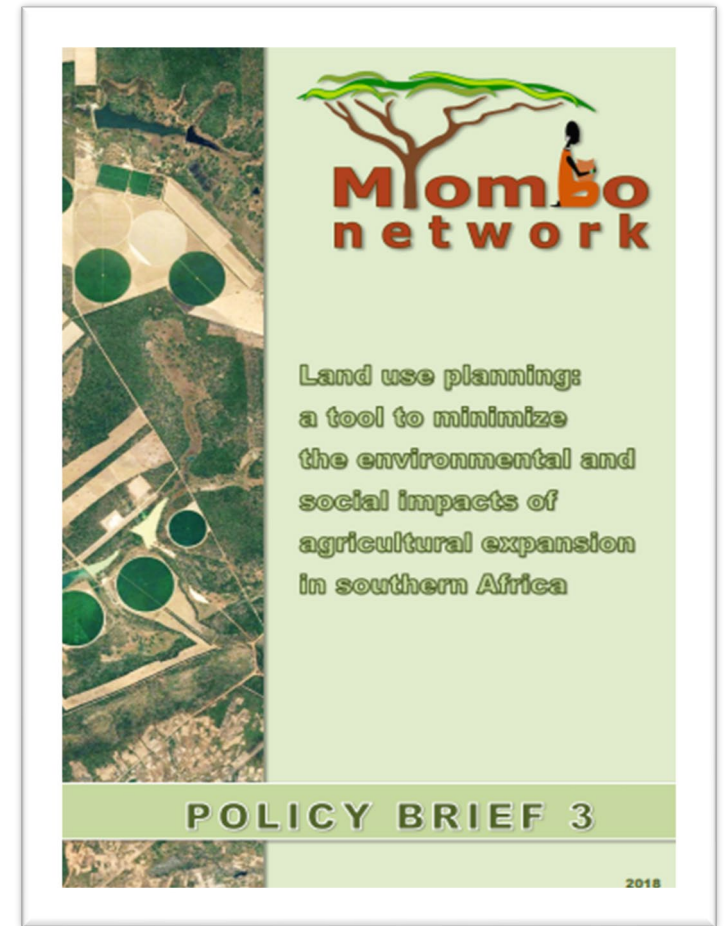
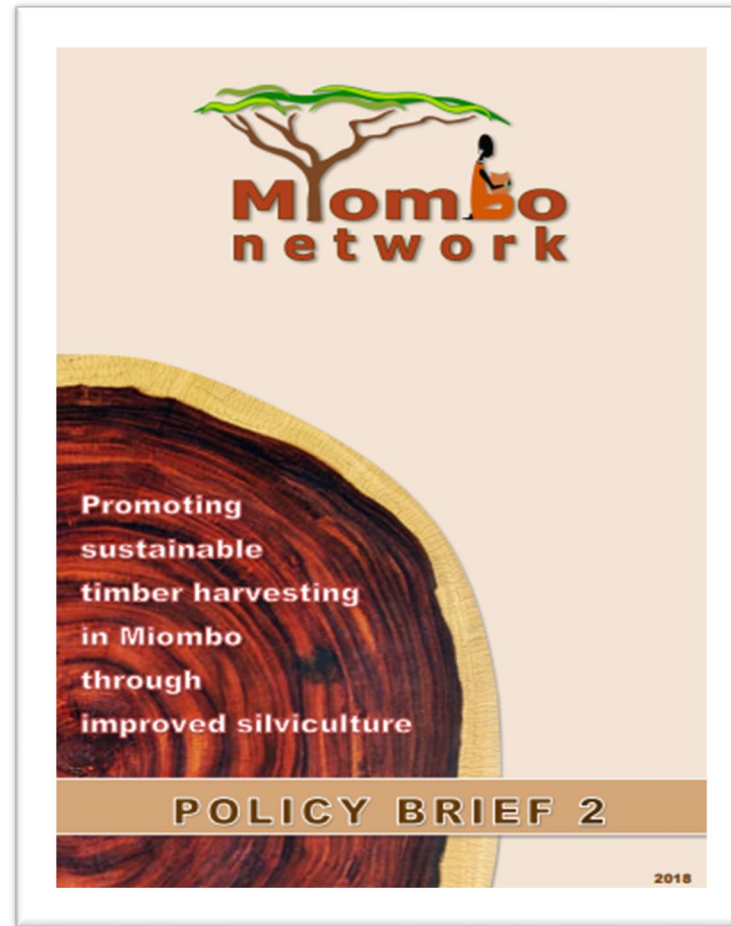
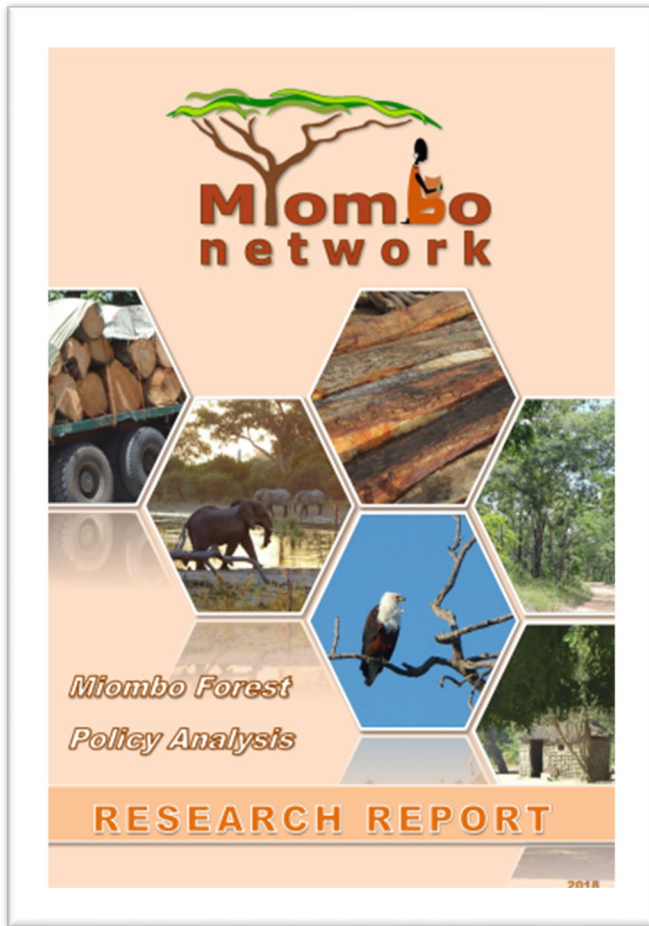


Conducts Research On Various Themes

Conducts research on various themes: ecology, socio-cultural and economic and governance in miombo forest to foster effective ...



Some Publications:



Introduced a quarterly MN Newsletter highlighting research activities and opportunities across the region and outside



MIOMBO NETWORK NEWSLETTER

ISSUE NO 1 | JANUARY – APRIL 2022 | COMPILED BY TATENDA GOTORE



TOPIC 01

Relationship between Herbaceous and trees species in Miombo Forest : A preliminary study in the Mikembo Reserve

Jonathan ILUNGA MULEDI* & David NKULU MWENZE*

TOPIC 02

SEOSAW-GGG Herbaceous Protocol Field Workshop, 15-25 March 2022

TOPIC 03

Future Ecosystems for Africa programme launched

To contribute in future issues follow this link
https://docs.google.com/forms/d/e/1FAPQLS19v7DV7hAWP317Fh0V481OGuIQKUhUDet1tW8IVcFv_1VRA/viewform?vc=0&c=0&w=1&fr=0&usp=mail_form_link

NOTE FROM THE STEERING COMMITTEE

This marks the first issue of our network newsletter which seek to keep network members updated of activities and opportunities across the region in hopes of fostering greater collaboration and engagement among members.

The Steering Committee would like to thank members who have made contributions to this issue and encourage all members to share their activities and programmes with us for inclusion into the future issues!

Funding Opportunities

This has been compiled specifically for WITS, but the information may be useful to the MN members, especially the funding opportunities for International Students:
<https://www.wits.ac.za/media/wits-university/study/fees-and-funding/documents/WitsFundingOpportunities.pdf>

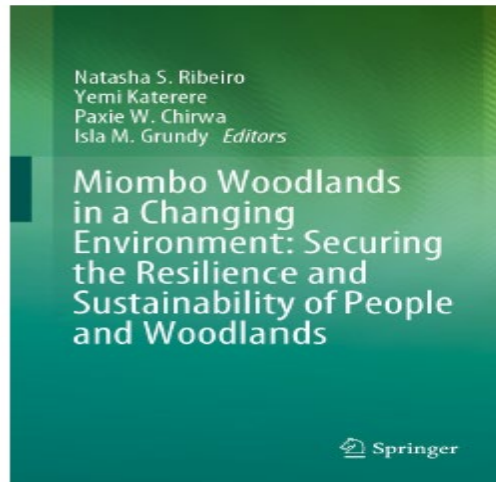




springer.com

Natasha S. Ribeiro
Yemi Katerere
Paxie W. Chirwa
Isla M. Grundy *Editors*

Miombo Woodlands in a Changing Environment: Securing the Resilience and Sustainability of People and Woodlands



N.S. Ribeiro, Y. Katerere, P.W. Chirwa, I.M. Grundy (Eds.)

Miombo Woodlands in a Changing Environment: Securing the Resilience and Sustainability of People and Woodlands

- Offers a socio-ecological management and policy analysis of the Miombo ecosystem in the global change context
- Provides a new framework for a better socio-ecological understanding of the Miombo woodlands
- Includes case studies which reflect the Miombo woodland management and conservation strategies
- Is academically rigorous and easily accessible by academics, decision-makers, and general readers

Based on work by the Miombo Network in southern Africa, this book helps decision-makers and general readers alike improve their understanding of the socio-ecology of the Miombo woodlands across southern Africa. It also highlights the importance of and the need for further research on the unique Miombo ecology and its link with economic development. One major challenge facing these woodlands is the influence that direct (both natural and anthropogenic) and indirect drivers of change, as well as interactions between these, have had over the centuries. As such the book explores the socio-economic and ecological interactions that occur in these woodlands and discusses the need for further research to provide a better understanding of these interactions. Drawing on data and information from numerous studies conducted in the last 20 years, the book presents a comparative analysis of policy changes and management experiences in the countries concerned.

1st ed. 2020. XXIX, 245 p. 57 illus., 38 illus. in color.

Printed book

Hardcover

139,99 € | £119.99 | \$169.99
[1]149,79 € (D) | 153,99 € (A) | CHF 165,50

eBook

117,69 € | £95.50 | \$129.00
[2]117,69 € (D) | 117,69 € (A) | CHF 132,00

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€ | \$ 24.99
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Book Launch and High Level Ministerial Meeting in Mozambique

- Launched in June 2021 in Maputo Mozambique
- Community Based Fire Management (current focus is on science)
- New Steering Committee was elected with well defined TORs, representing all 7 Miombo countries
- On 4th August 2022, the Government of Mozambique has organised a high level meeting on “Sustainable Management of the Miombo Forests” and lead authors of the Miombo book will present at the meeting.

Webpage and Acknowledgements

- All information about the description of miombo network, the steering committee, works conducted by the network (including publications, researches), media, discussions, contacts can be accessed by clicking on the link: <https://miombonetwrok.org/>.
- Acknowledging the former MN Steering committee (Natasha Ribeiro, Sally Alchbald, Stephen Syampugani, Judith Kamoto) for the publications and MN meeting in June 2021 where the book was launched
- Acknowledging all the lead authors of the miombo book and editors and funders START and GOFC-GOLD



Brief History of SAFNet

1st Meeting : IGBP/START/LCLUC Miombo Network Workshop on Ecology and Management of Fire in Miombo, Matopo, Zimbabwe, 19-23 April 1999

2nd Meeting: Zimbabwe-Zambia Traveling Meeting, 11-19th July 2000

3rd Meeting: University of Botswana, Gaborone, Botswana, 29 July – 1 August, 2002

4th Meeting: Kruger National Park, South Africa, 17-23 August 2003

5th Meeting: Mangochi, Malawi, 9-13 August 2004

6th Meeting: Maputo, Mozambique, 5-6 October 2006

7th Meeting: Katima Mulilo, Namibia, 22-26 September 2008

8th Meeting: Golden Gate National Park, South Africa, 6–8 May 2011

9th Meeting: Morogoro, Tanzania 4–8 February 2013

Field Campaign: Validation field campaign, KNP, South Africa August 2014

10th Meeting: Kruger National Park, South Africa 16-18 April 2018

11th Meeting: Virtual, 28-29 July 2021

12th Meeting: being planned for 2022 (Val Chalton, O Hoffmann, Natasha Ribeiro same as *th Meeting with Land managers



11th SAFNet Virtual Meeting

Current Steering committee members - 2018

Navashni Govender – South Africa – Navashni.govender@sanparks.org

Philip Frost – South Africa - PFROST@csir.co.za – no longer in the region

Wisdom Dlamini – Swaziland - mwdlamini@gmail.com

Ntandokamlimu Nondo - Zimbabwe - ntando.nondo@gmail.com

Judith Kamoto – Malawi - judithkamoto@gmail.com

SAFNet Administration and Governance Structures

- SAFNet steering committee objectives:
 - Developing, directing and management of network activities & delivering pre-defined outcomes
 - Seeking & managing network opportunities and events
- Committee member roles:
 - Fund raising & marketing
 - Identification and follow-up on collaboration opportunities
 - Identification, conceptualisation and funding of joint project
 - Reporting

11th SAFNet Meeting Outcomes

SAFNet Future: Identifying regional fire projects or activities that can sustain the Network, where “Success breeds success” through the following Themes:

Theme1: Sharing knowledge from Africa

Projects	Partners
Reconciling and integrating CBFiM into the fire science and fire products	Gernot Ruecker, Glynis Humphrey, Val Charlton)
Learning & exchanging from the global south on including traditional knowledge and how to include communities in fire	
Projects around community and cultural awareness, education and generally involving the communities more in the fire research/ projects happening on their lands.	
Sharing information about prescribed burning	Matthew Jones, Tercia Strydom

11th SAFNet Meeting Outcomes

Theme2: Capacity building in Africa

Projects	Partners
Access to databases on fuel consumption, emissions estimates etc	Gernot Ruecker, John Molefeji
Higher resolution satellite data for measuring emissions and ecological impact	
Knowledge gap on fire spread models and Validation data	
Fire danger indices (development and communication support), review on which countries are using FDI's?	Karen Steenkamp – calibrating FDIs Jesus San Miguel – data provision

11th SAFNet Meeting Outcomes

Theme 3 :Research projects SAFNet can Initiate

Projects	Partners
The proposed census/database of fire experiments across Africa	Sally Archibald, David Roy, Kebonye Dintew, Tercia Strydom, Chenay Sims, Judith Kamoto
Standardised fire experimental data collections	Caroline Esther, Fabiano– other MN members
There is some scope for regional Validation projects for new products	Lekoko, Karen Steenkamp
Fuel consumption, fuel models, fire spread simulations and/ or emissions. Especially around small fires that cannot be adequately monitored remotely	Riaan van der Dool
Fire emissions over seasons, quantifying, reporting and forecasting	Kebonye Dintwe, Sally Archibald, Glynis Humphrey, Tatenda Gotore, Onalenna
Novel approaches, such as Paleo fires for very long term fire records –validation – protocol for collecting surface samples of fire.	Abraham Dabengwa, Adele Julier

11th SAFNet Meeting Recommendations

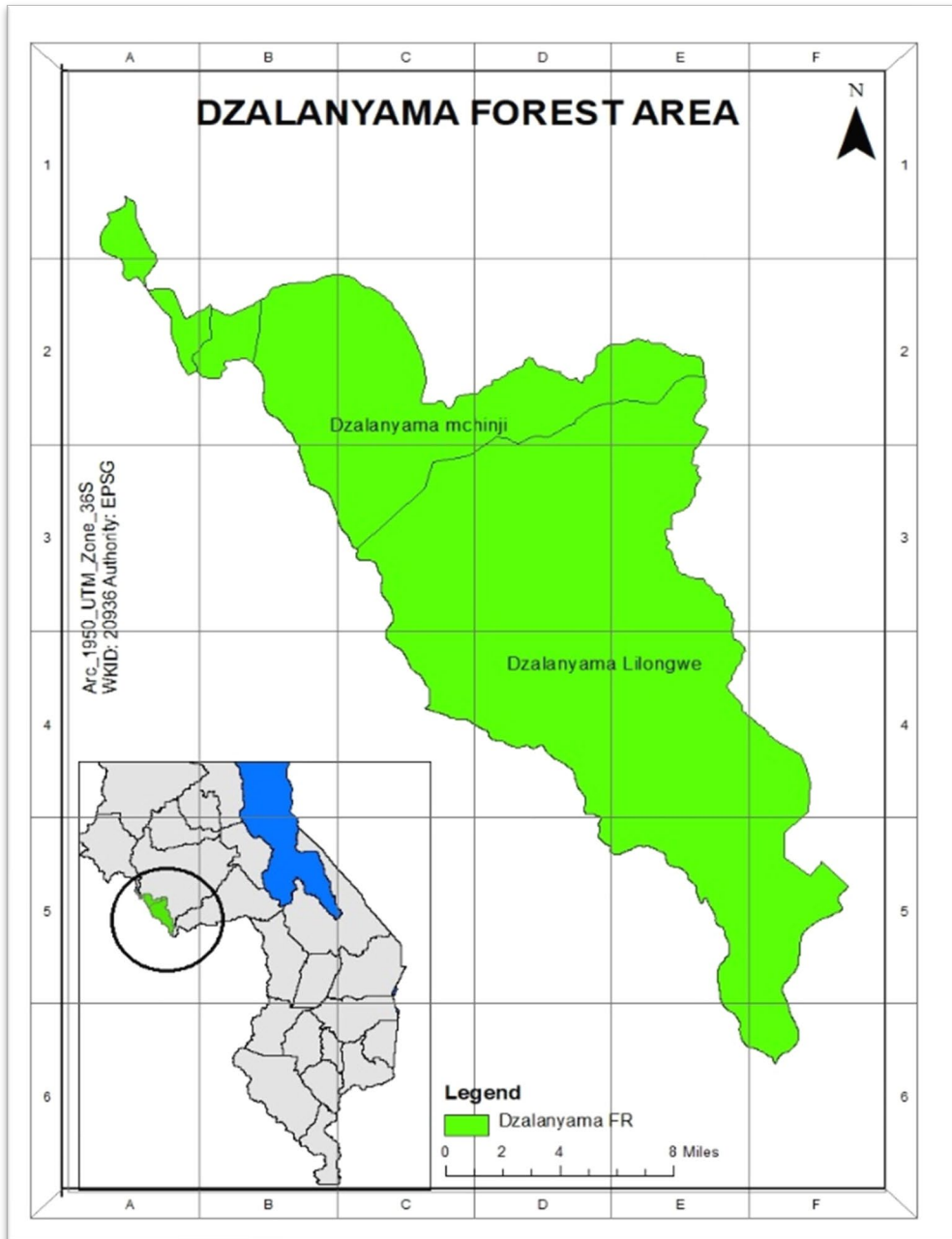
- SAFNet proposed the following projects for the use of NASA funding to START for Network Meetings:
- Support for Masters and PhD tuition and stipend - students in the region that will work on regional based questions. That means will work within SAFNet member countries on fire questions that affect the region.
 - Two such questions are (1) a review of long term fire experiments in Africa.
 - To improve fire emission values, especially as a result in changes of fire season. This will directly affect the carbon credit counting and carbon question values from Africa.
 - We already have commitment from South Africa and Mozambique to host students.
- Live Labs – Provide the opportunity to young fire researchers to travel to various fire biomes in Africa to gain first-hand experience as to how fire is managed and its impact on people and the ecosystem.
- Refresher virtual courses on fire information services - CSIR is committed to run these. (Preparation and two day training session)
 - AFIS
 - FDI's and fire risk assessments
- Fire and people (especially kids) – There is a lot of fire education and awareness material available, but the question is how do we get this information to people and then how is the information communicated. Develop a Fire APP. “Gameify fire information” to reach a younger audience. Two NGO's – Landworks and Global Conservation Corps, are ready to work with SAFNet to development the APP.

Spatial Analysis of Fires/Fire Management in FR

- The Southern African Centre for Climate Change and Adaptive Land Management (**SASSCAL**) A spatial-temporal analysis of fire was conducted using the NASA FIRMS MODIS active fires (1 km gridded) and also an analysis of a per 10 km by 10km grid cell fire frequency from 2001 to 2020.
- The results revealed great areas of high fire frequency in miombo woodlands.
- Equally, a temporal analysis of 5 years interval showed an ascending trend of burned areas in southern African ecosystems, with emphasis on Zambia and Angola, where a higher burned area as compared to Zimbabwe and Botswana was observed.



A spatial analysis of Fire in DRF, Malawi



- Dzalanyama forest is located between latitude $14^{\circ}11'S$ and longitude $33^{\circ}21'$.
- Its topography is 1100m to 1659m above sea level and It receives about 800 mm to 1200 mm rainfall annually. Its temperature ranges from about $14^{\circ}c$ to $28^{\circ}c$.
- Its covers approximately $984km^2$
- Forest types and sizes
 - Miombo woodlands : $818 km^2$
 - Eucalyptus plantation : $38km^2$
 - Pine plantation : $32 KM^2$
 - Wetlands : $96 km^2$

NASA FIRMS FIRE EMAIL ALERT

NASA FIRMS: Fire Email Alert
16 fires/hotspots detected during the
most recently processed satellite
overpass on 20 June 2022

*(Protected Area: Dzalanyama [Malawi],
including a buffer of 5 KM)*



METHODOLOGY

Sampling technique

- Random sampling of the points to be analyzed

Accuracy assessment

How well does the map represent what's out there.

- Reference data :Ground truthing (GPS)

GIS layers

- Compare maps with reference
- Interpreting the results.

Methods

NASA MODIS alerts

Landsat Images

GPS

ArcGIS mapping

Data Collected

Fire occurrence

Fire frequency

Fire spread(total area burned)

Location

Data Analysis

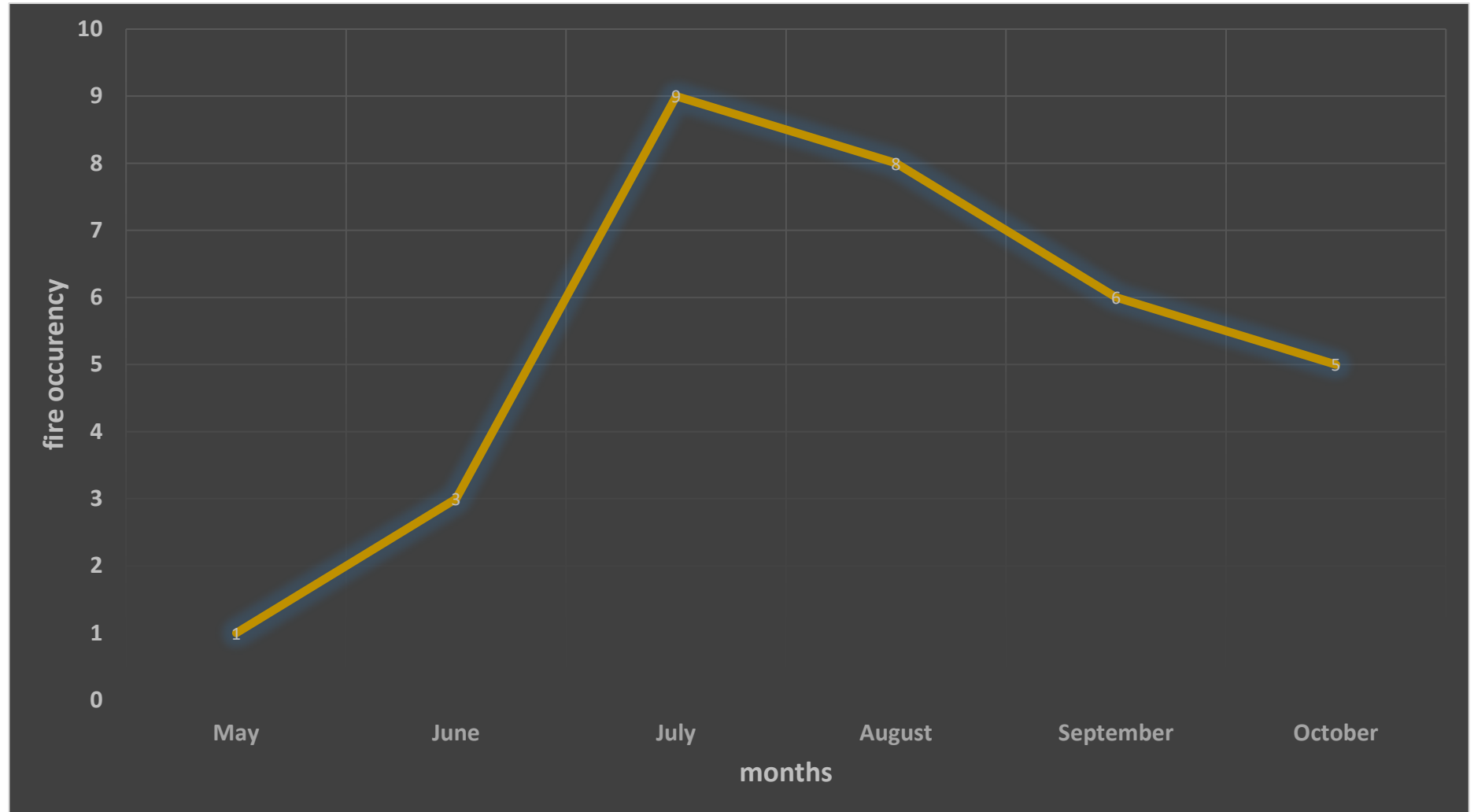
ArcMap image classification and analysis

Excel area estimation



RESULTS

**Average fire
occurrence
monthly**



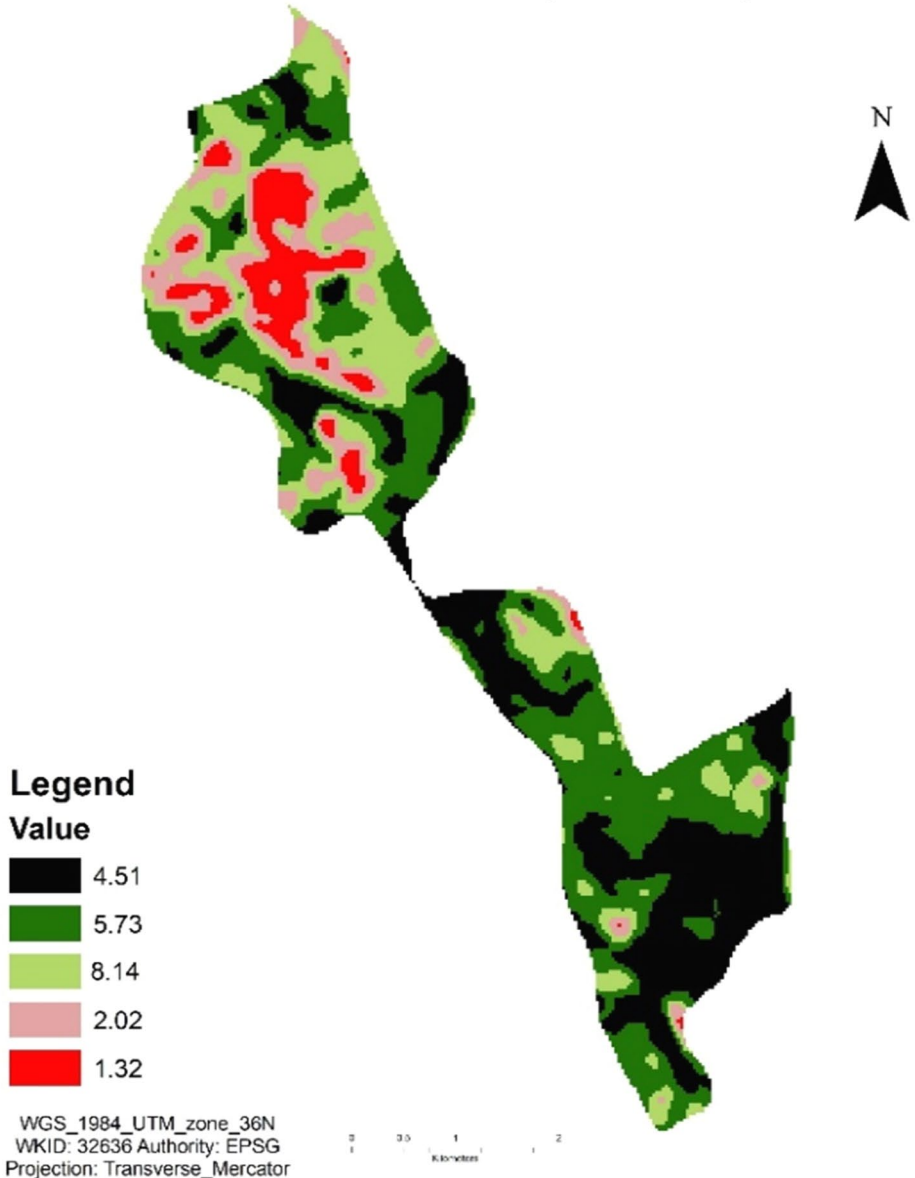
Spatial analysis of the fires

- **Dzalanyama forest Reserve: Mchinji Part**

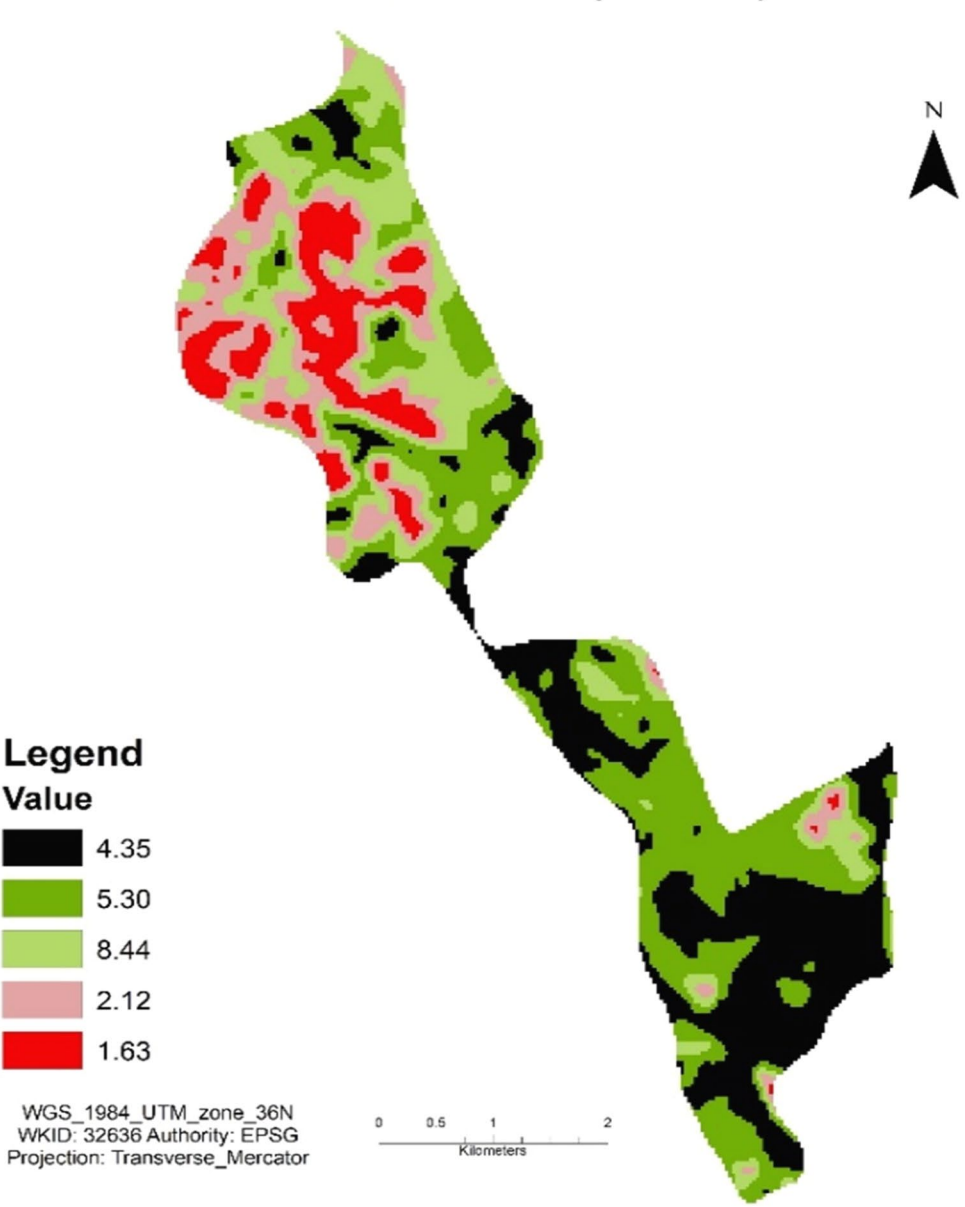
Year	Total Area Affected (km ²)	area affected (%)
2013	0.31	1.9
2015	1.27	7.8
2017	0.27	1.7

Spatial analysis of the fires

BEFORE FIRE IMAGE 2013 (FEBRUARY)

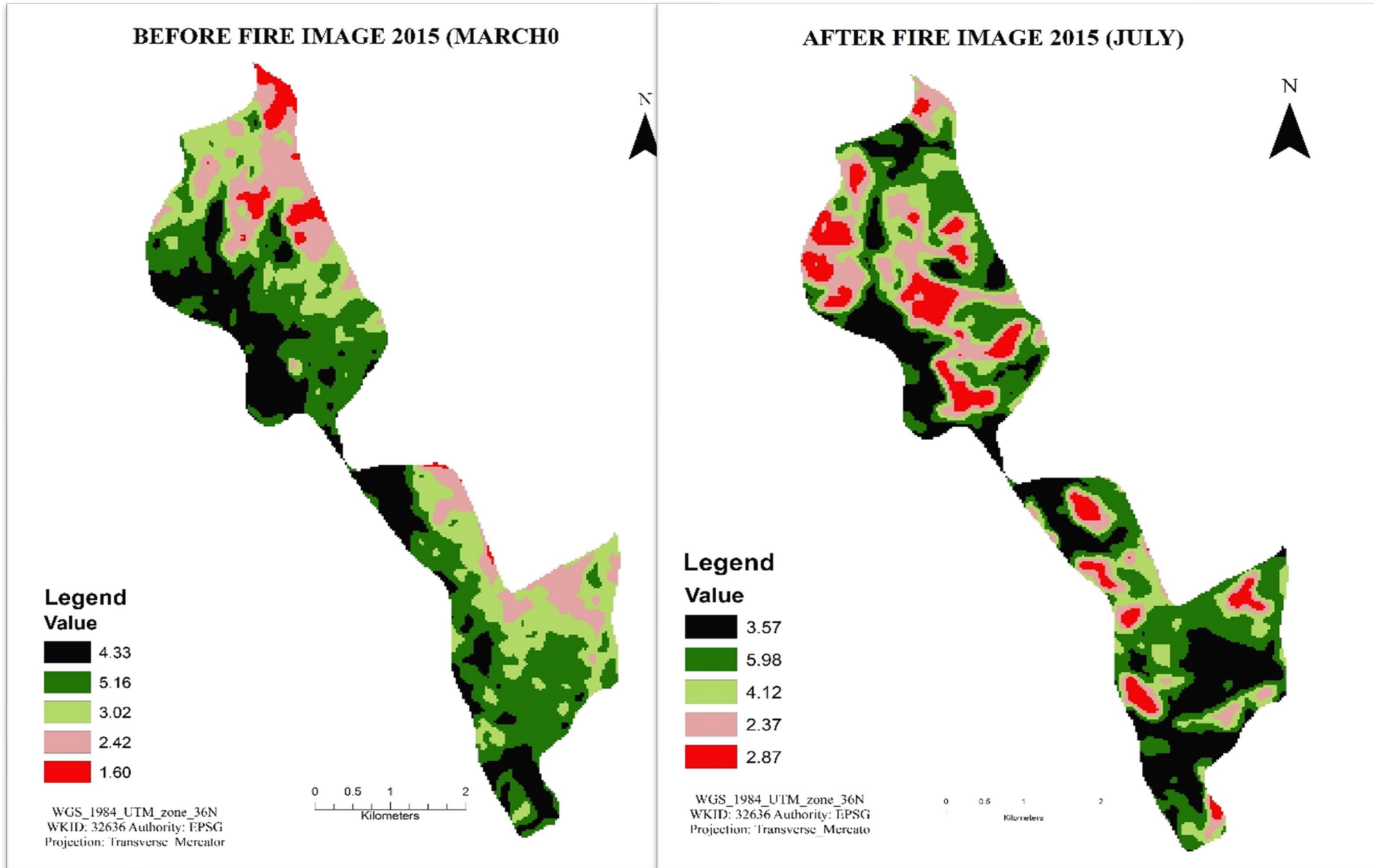


AFTER FIRE IMAGE 2013 (AUGUST)



Total area affected by the fires
0.31km²
(1.9%)

Spatial analysis of fires



**Total area
affected by the
fires in 2015
1.27km² (7.8%)**

Spatial analysis of fires

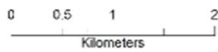
BEFORE FIRE IMAGE 2017 (MARCH)



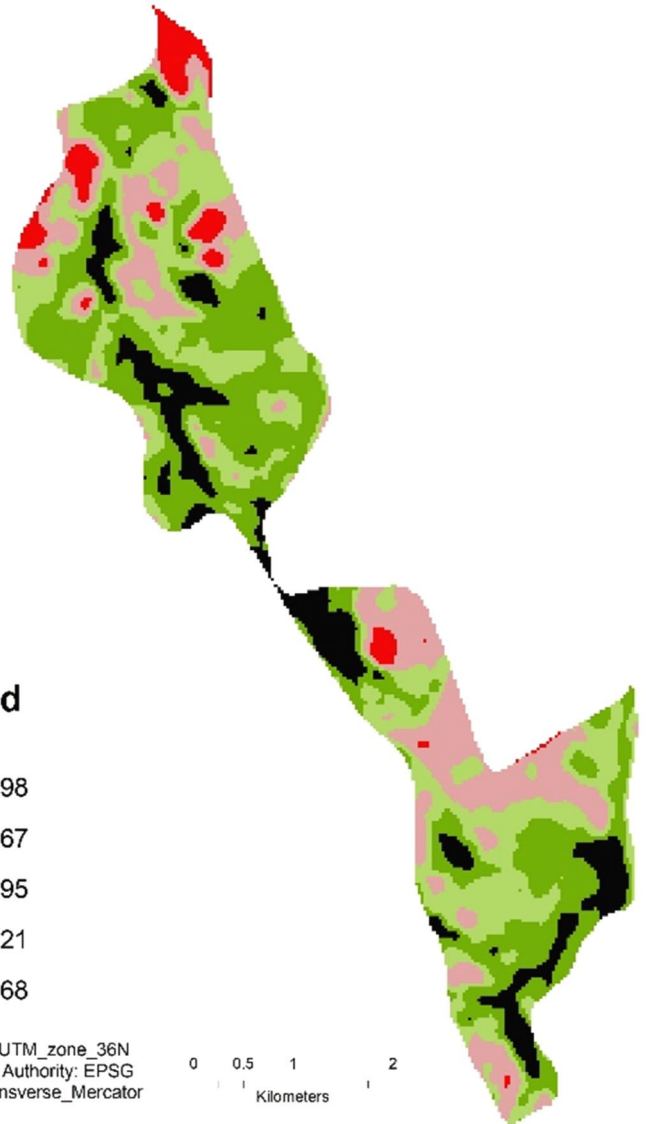
Legend
Value

- 2.16
- 5.71
- 5.19
- 3.10
- 0.41

WGS_1984_UTM_zone_36N
WKID: 32636 Authority: EPSG
Projection: Transverse_Mercator



AFTER FIRE IMAGE 2017 (JULY)



Legend
Value

- 1.98
- 7.67
- 4.95
- 3.21
- 0.68

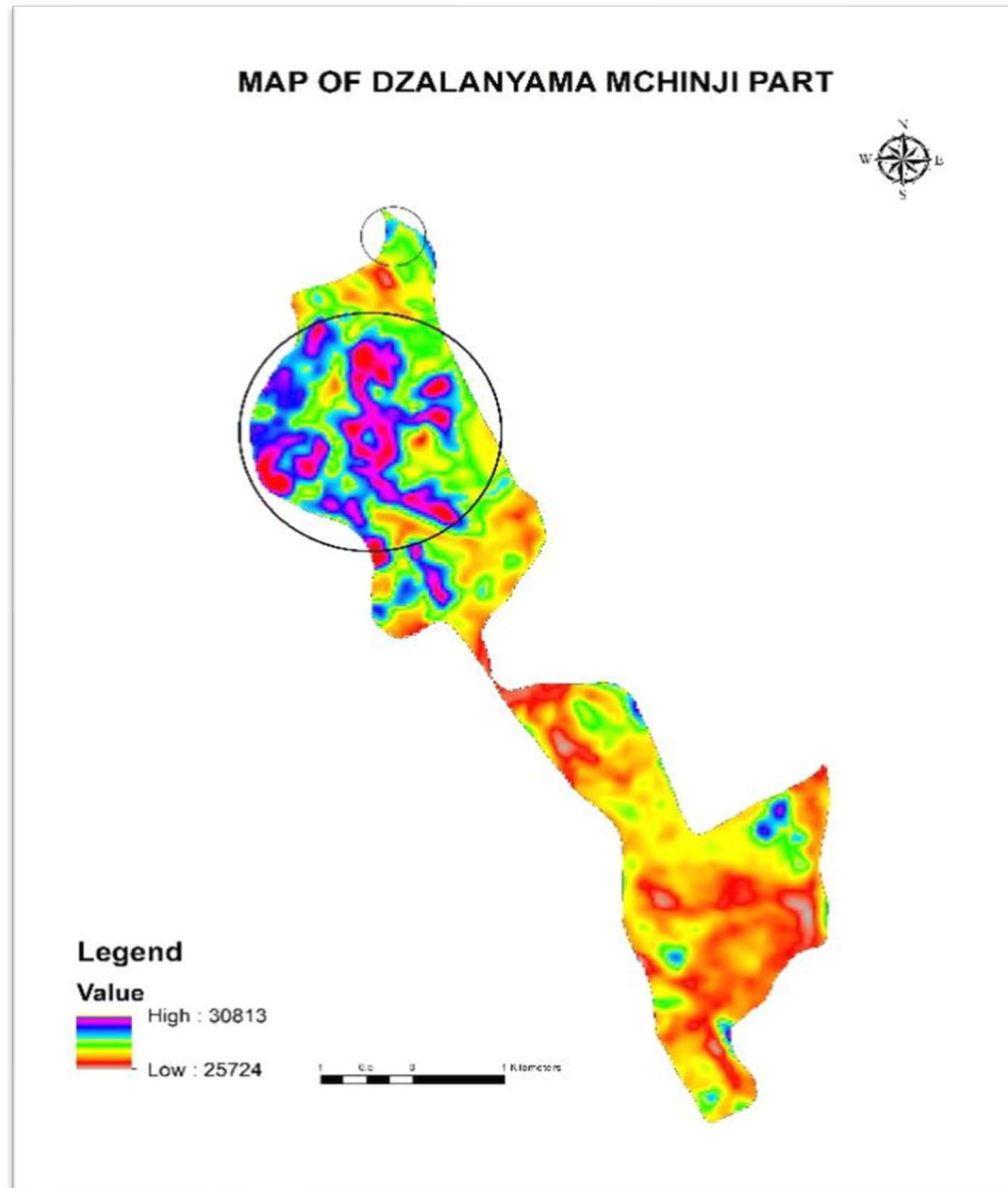
WGS_1984_UTM_zone_36N
WKID: 32636 Authority: EPSG
Projection: Transverse_Mercator



Total area affected by the fires in 2017
0.21km² (1.7%)



Spatial analysis of fires



**Areas mostly affected
by the fires**

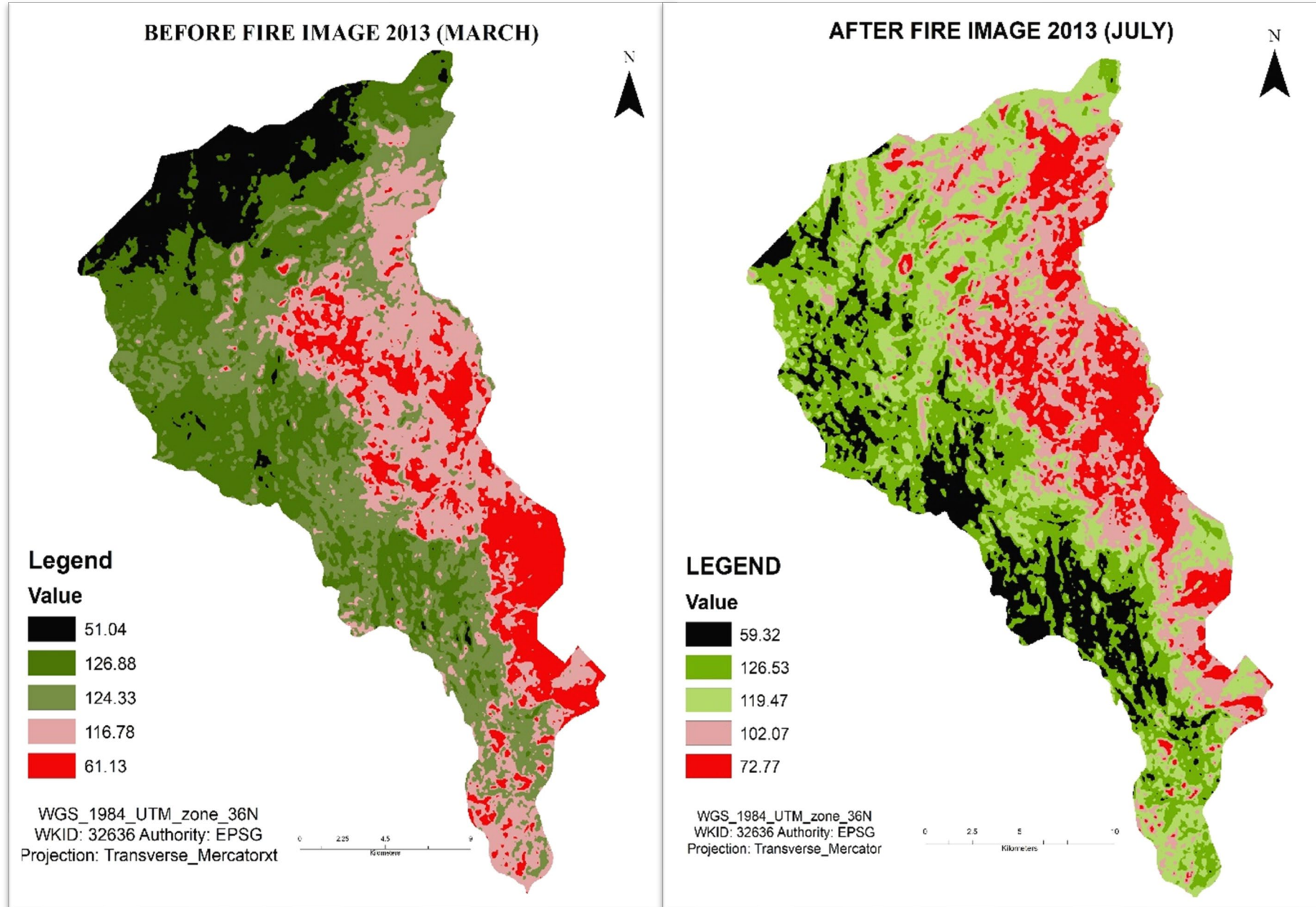
Spatial Analysis of fires

- Dzalanyama Forest Reserve: Lilongwe Part



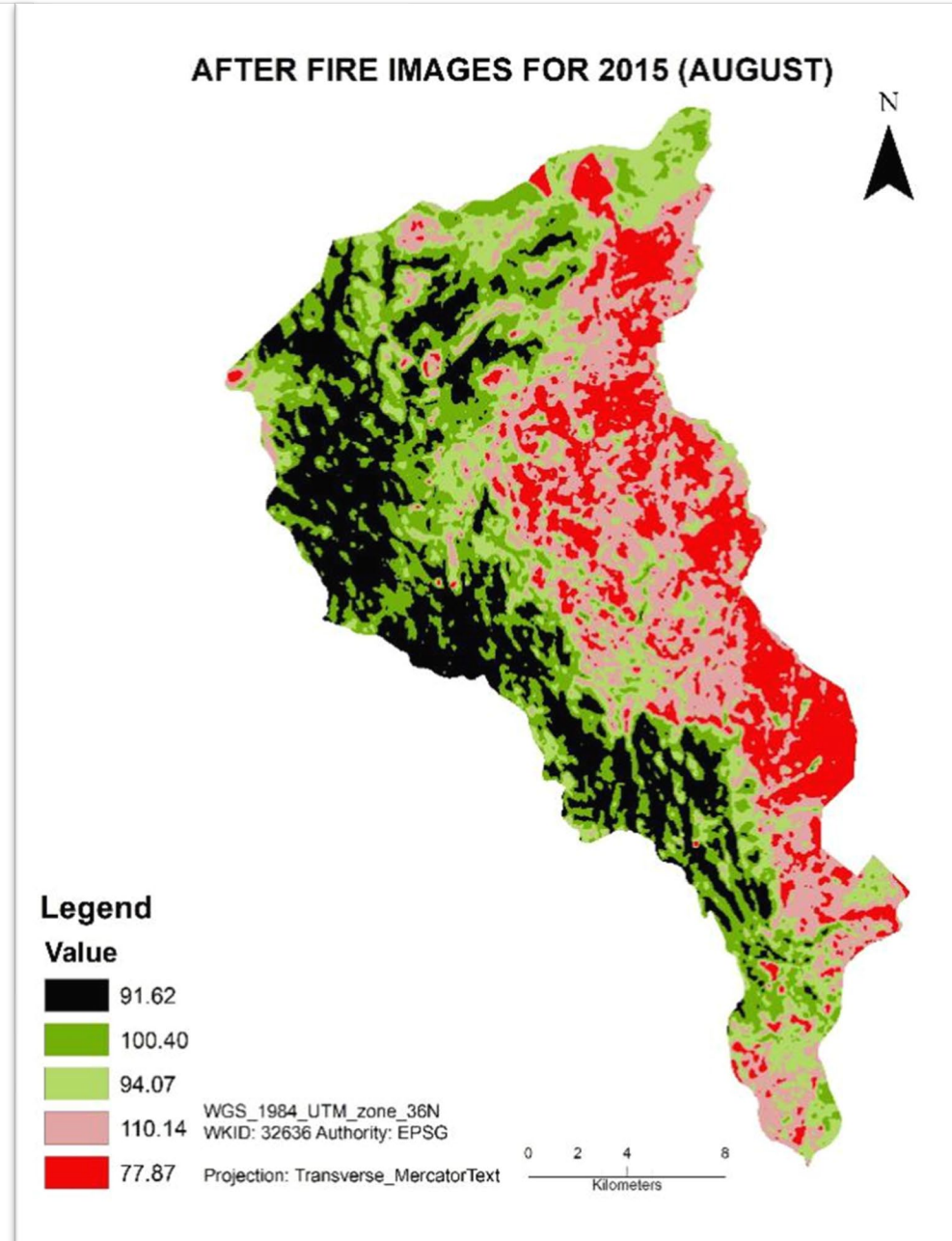
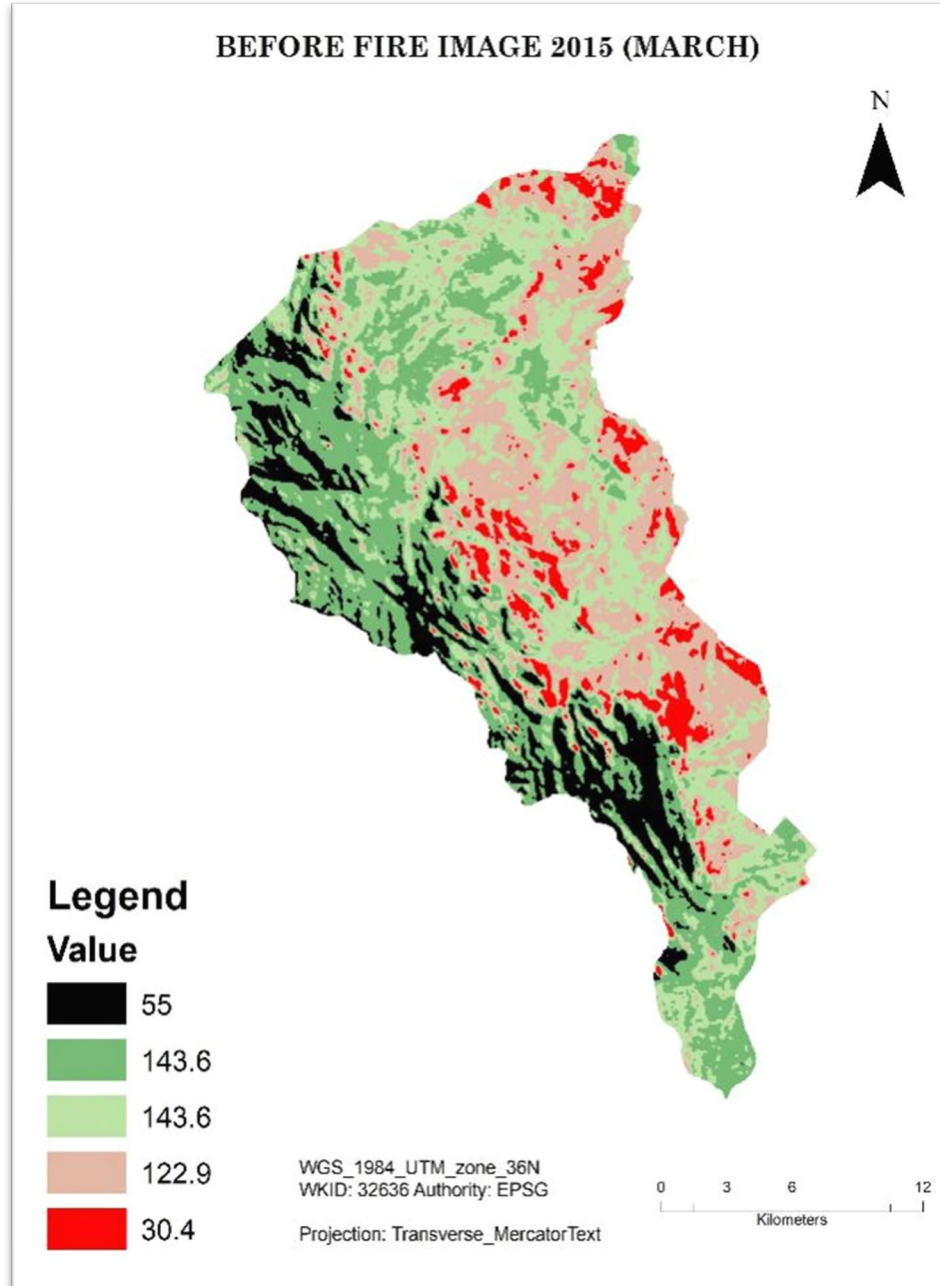
Year	Total area affected (Km ²)	Area affected (%)
2013	11.64	2.4
2015	47.47	9.9
2017	11.4	2.4

Spatial analysis of fires



**Total area
affected by fires
in 2013 11.23km²
(2.4%)**

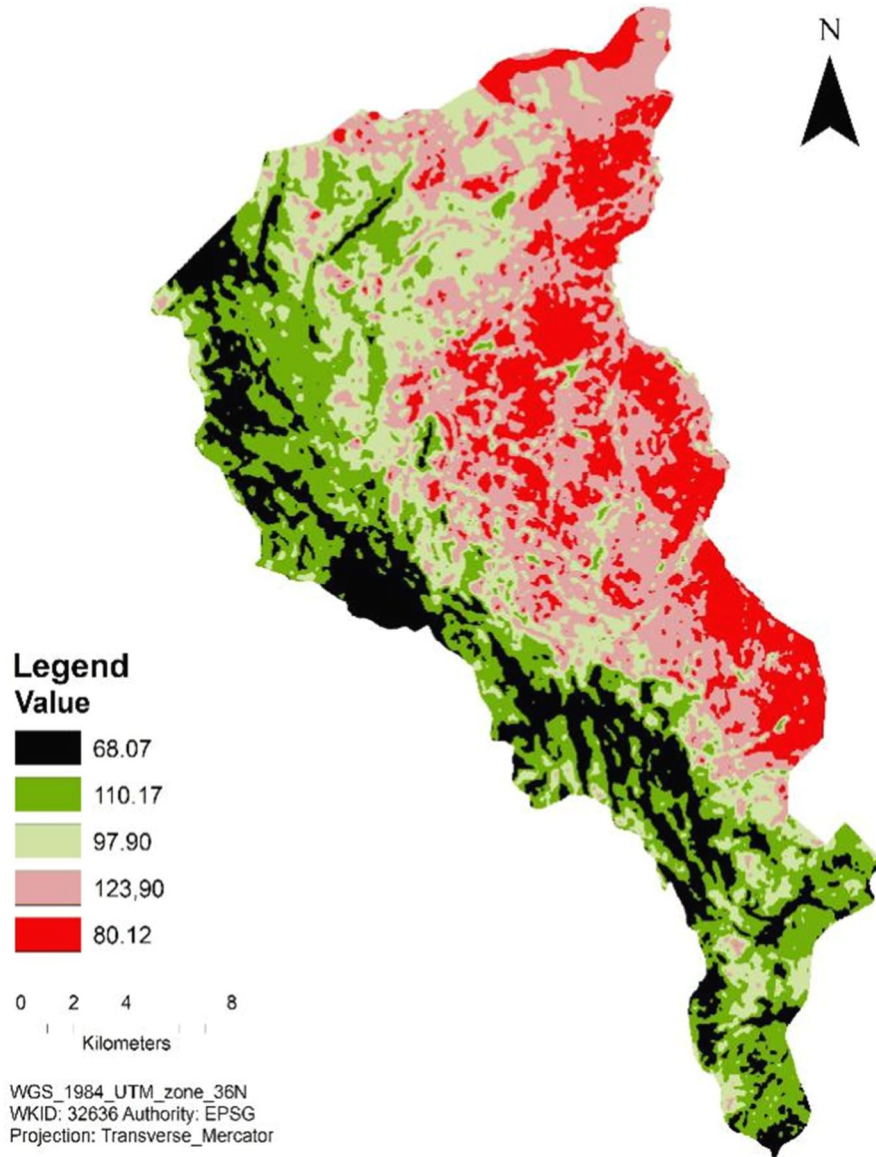
.Spatial Analysis of fire



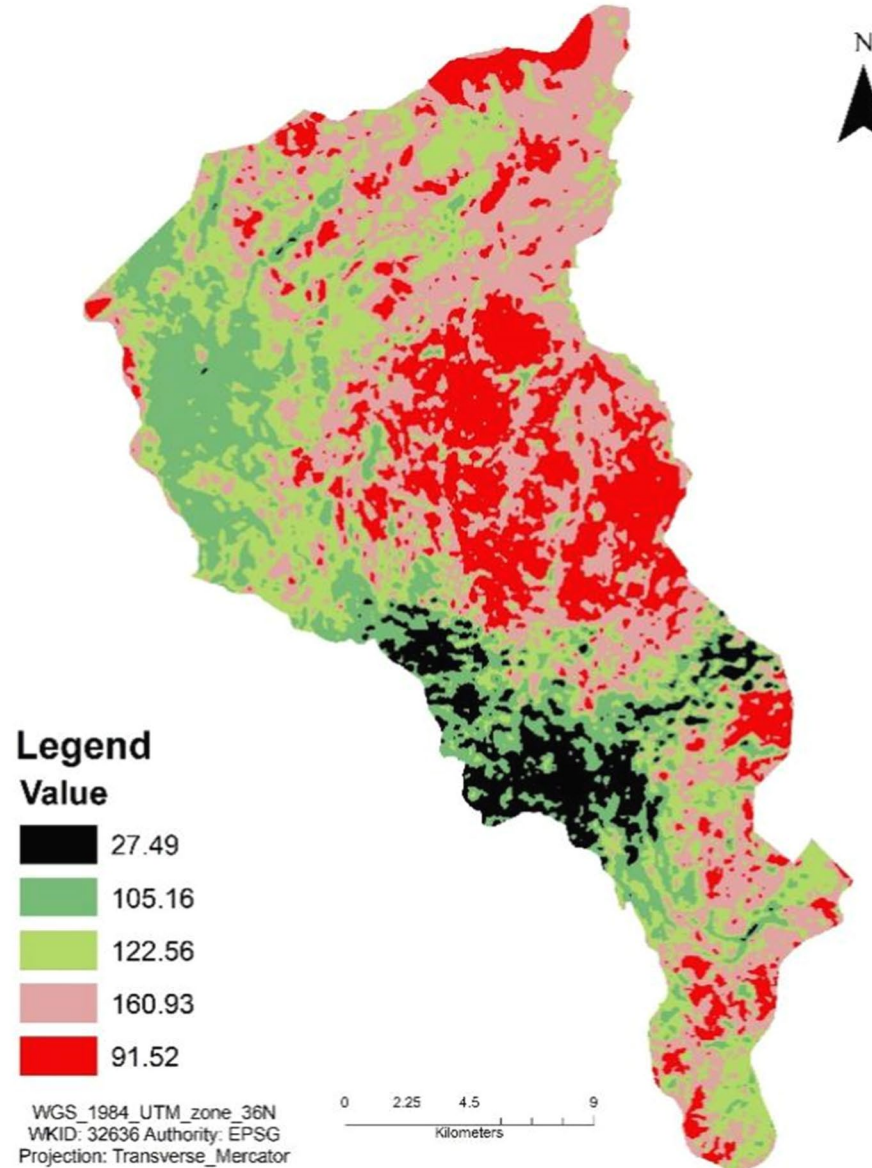
**Total area affected by the fires in 2015
47.47km²
(9.9%)**

Spatial analysis of fires

BEFORE FIRE IMAGE 2017 (MARCH)

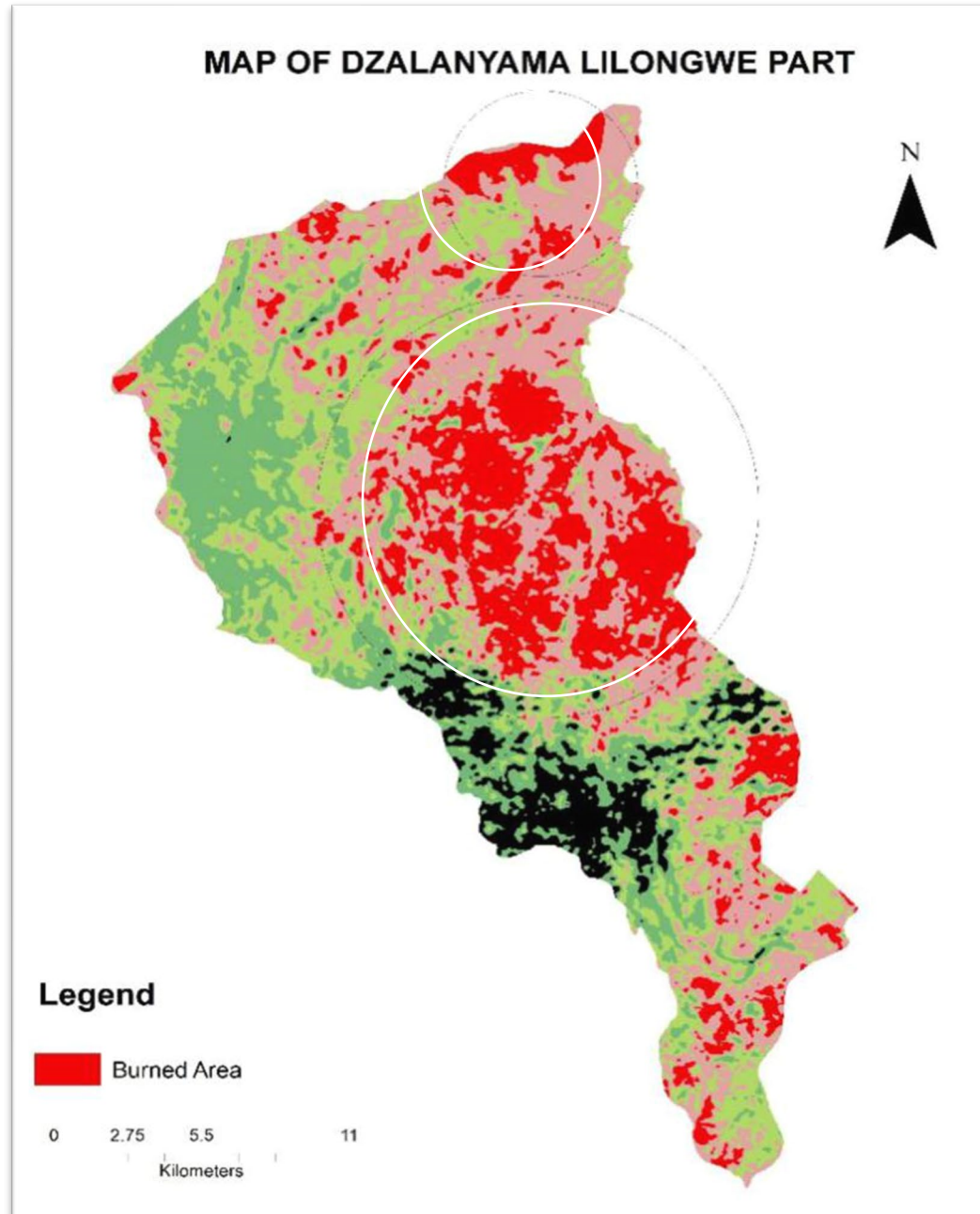


AFTER FIRE IMAGE 2017 (JULY)



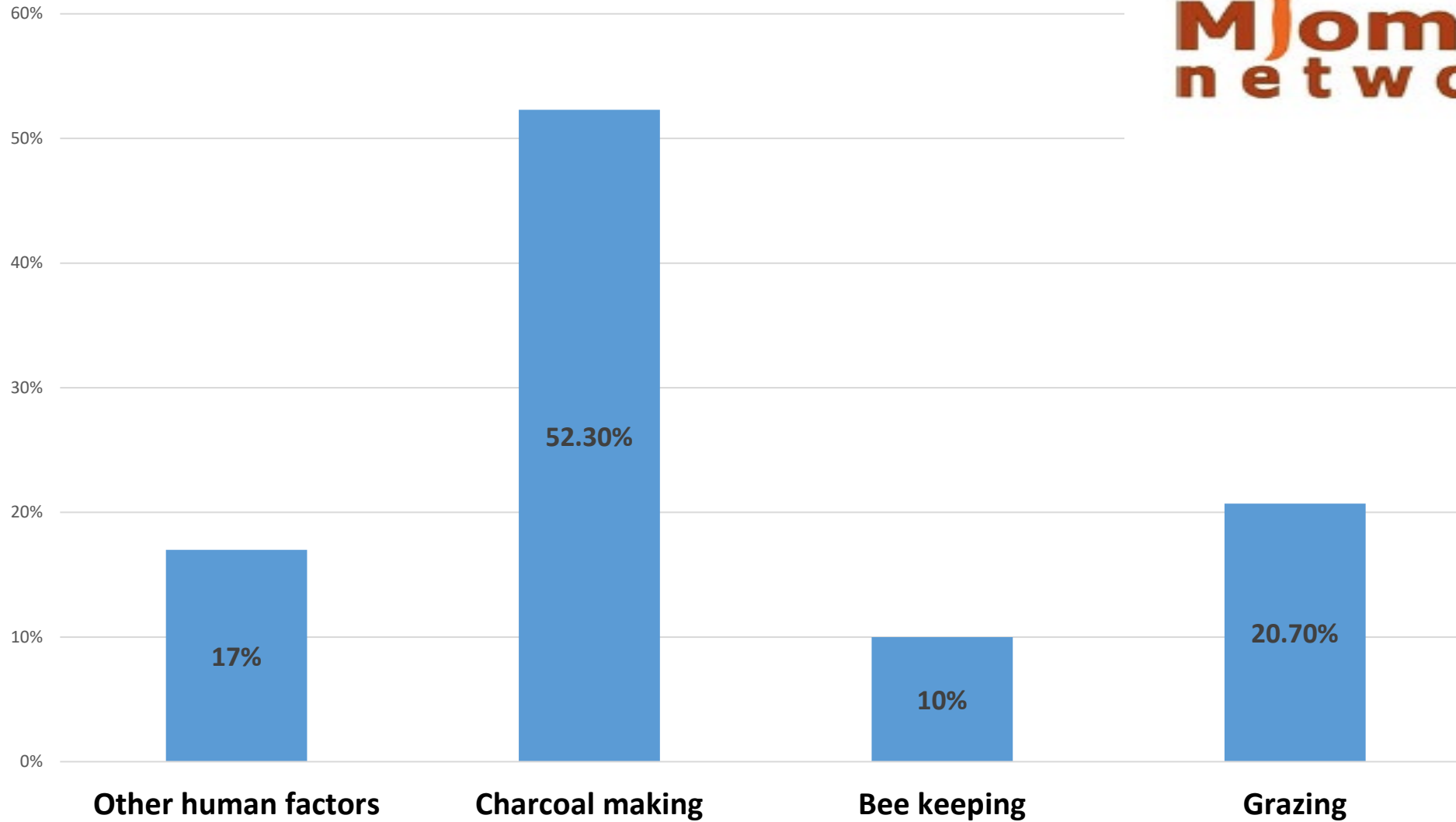
**Total area
affected
by the fire in 2017
11.4km² (2.4%)**

Spatial analysis of fire



**Areas Mostly affected
by the fires**

Causes of forest fires



Fire Mgt in Kruger National Park



- Results of fire experiment conducted in the KNP reveal there is a very strong relationship between fires and elephants.
- From the different manipulation scenarios, it was observed that the reduction of fire frequency contribute only for an increase in wood habitats, compromising the other aspects of the ecosystem such the quantity and quality of forage, herbivory, predators, ecotourism and game parks.
- As consequence, reduction of fire frequency in savannah contribute to a mega loss of fauna biodiversity conservation, provision of ecosystem services and loss of economy.
- As a conclusion, fire in Africa is wicked problem because of its complexity, necessity and interaction withy other drivers, but also it is a very important tool that we need to be able to utilize in our landscapes. We have a lot of fires in Africa, but it is not always bad and can be very good for the ecology and people.

Fire Management in NIASSA Special Reserve



- In NSR, an average of 2-3 years inter-fire interval is the optimum fire regime to maintain the equilibrium of the ecosystem.
- However, shifting from this fire regime to annual burnings compromise the ecosystem by promoting grass biomass and reducing wood biomass, particularly the fire-intolerant species such as the *combretaceae*.
- As it was shown by other studies that NSR is an important carbon sink, an increase in fire return interval from annual to the optimum fire regime (3.29 years) may increase the ecosystem capacity of carbon sequestration by a higher rate (4MgC/ha/year) than areas of annual burnings.
- Management of fires by shifting the season of fires is a good management practice that improves carbon sequestration.
- This has been shown by a GapFire model where about 60% of carbon emissions are reduced as result of a fire management practice consisting of shifting proportions in early and late dry seasons (increasing early dry season prescribed fires by 80% to reduce late dry season fire in 50%).

Areas of future collaboration

- Fire related research in the miombo region, considering the role of fire in the evolution of miombo woodlands.
- Create a well constituted group in each country, called a "fire core", which will report back from the grassroots.
- Contribution to the UN Decade of restoration – capacity building initiatives in support of the Decade of restoration.
- Joint research or response to calls in areas of mutual interest



Areas of future collaboration

- To increase our visibility, publish scientific articles and write study reports for policy makers to pool our efforts.
- Collaboration with SEASOW on a study to develop guidelines for sustainable harvesting of woodlands in the region
- Conducting research and responding to funding calls as MN and jointly with SAFNET where possible, to inform Policy
- Conducting training initiatives (in the region) that could be organised by both MN and SAFNet.



Thank you



www.miombonetwork.org