Developing fire reduction strategy for Miombo woodlands as a potential tool for carbon storage and sequestration

Every year wildfires destroy considerable forest resources in Tanzania. Such destruction includes both timber and non-timber forest products and in some cases threatens residential areas.

Many wildfires are purposely set to clear land for agriculture, and some of these wildfires may get out of control and destroy unintended areas. In the last decade, many African countries have given wildfire very high priority by allocating more resources to fire management.

Wildfire occurs in most parts of the miombo woodlands in Tanzania. The local farmers adjacent to the forests practice traditional farming and fire is used as a management tool. In addition, fire is used for hunting, hasten grass growth for livestock, reducing pests and facilitate accessibility. In the miombo ecosystem, some of these fires cause significant ecological and socio-economic impacts such as: reductions in water supply, loss of biodiversity, pollution of water sources, reduced carbon sequestration and reduce agriculture production. Therefore, a sustainable management of the miombo is critical for local, national and global interests.

Forest condition after fire .

In Tanzania, there are no clear solutions to the fire problems despite availability of regulations and laws on fire control. National forest laws preventing fires tend not to be appreciated in the rural areas where local by-laws are more important. There are some areas where fire incidences are rare and these apparent local successes in fire control can be scaled up to address the fire problems in the miombo.

Several efforts have been made to reduce fire frequencies in the miombo ecosystem. In spite of such efforts, the major handicap to forest fire management is lack of forest fire records which should include the location of the incidences, time and day of occurrence, causes of the fire, and financial losses incurred. There is also lack of detailed

local fire knowledge and practices. The said handcap are compounded by lack of funds, personnel and/or proper strategies. Availability of data/information could provide a foundation for the design and prioritization of future wildfire management activities in the country.

Therefore, the understanding of the fire administrations and the effects on vegetation under different management scenarios as well as the overall socio-economic situations can help to develop fire management strategies that will serve as a tool for carbon storage and sequestration in the miombo ecosystem. The predicted strategy will enhance the establishment of an effective and functional National Fire Policy in Tanzania.

Setting fire in one of the field plots

Expected output of the project

The main output of this study is a draft Fire Management Strategy as a tool for climate change mitigation for the miombo woodlands and articulating fire monitoring protocols which could be used by different actors. However, the project looks forward

to increasing awareness and understanding issues, challenges and opportunities to climate change and Reduced Emissions from Deforestation and Degradation (REDD) in particular. REDD is a set of steps designed to use market and financial incentives in order to reduce the emissions of greenhouse gases from deforestation and forest degradation.

Moreover, the researchers also expect to increase capacity of carbon storage and sequestration in vegetation under different fire management scenarios and burning regimes. Another expectation is to learn about the reasons of fire occurrence and its effects on miombo woodlands and grasslands. To educate different actors on better management of forests fires and networking, to integrate the Forest Fire Database Management System (FFDBMS) for the local forest practitioners which will not require any special software to run and to determine the impact of NGO interventions in forest conservation/fire reduction.

Outreach plan of the project

The researchers in this project expect participation of local communities and forest practitioners. Their involvement in different stages of the project is of high importance. The outreach package will therefore address selected forest practitioners, including women, to be trained in fire monitoring and reduction strategies, and the measurement of impact of fire through the reduction of forest fires and levels of awareness amongst stakeholders. The package will include fliers, brochures and posters on fire

monitoring and reduction measures to be posted in strategic areas in villages and districts. Policy briefs and project recommendations will be discussed with relevant stakeholders before channelled to policy makers. Scientific results will be published in relevant journals.

Training before field work

Project progress

The project has so far managed to establish baseline data on the carbon stored in the trees before the fires, and the carbon stock after induced fire. Forest composition and structure has also been determined. Data on socio-economic dimensions determined site specific causes of fire, while local understanding and perception of forest fire were also captured and recommendations on how to reduce fire incidences proposed by the communities. The collected biophysical information/data was analyzed and presented at the CCIAM scientific workshop held at Blue Pearl-Dar es Salaam in July 2012. Most of the 2013 data has been analysed and will be added to the former to come out with a journal paper. A paper on socio-economic dimensions is being

prepared for the November CCIAM Conference and later for a journal paper.

Information on CCIAM

CCIAM (Climate Change Impacts, Adaptation and Mitigation) is a programme at Sokoine University of Agriculture (SUA), carried out with several partners in Tanzania and the Norwegian University of Life Sciences (UMB). The project "Developing a fire reduction strategy for Miombo woodlands as a potential tool for carbon storage and sequestration" falls under the CCIAM programme and started in June 2011 under the partnership of Prof. S. Madoffe, Principal Investigator, Department of Forest Biology (SUA). Other researchers include Dr. Gimbage Mbeyale (SUA), Dr. Eliakimu Zahabu (SUA), Dr. Emma Liwenga (UDSM); and Ms Beatrice Tarimo (ARU) and Prof. Fred Midtgaard (UMB).

For more information go to http://www.suanet.ac.tz/cciam/

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