



## 9<sup>th</sup> Southern African Fire Network (SAFNet) Meeting 05<sup>th</sup>- 07<sup>th</sup> February 2013

***Venue: Tanzania Forestry Research Institute (TAFORI), Morogoro, Tanzania***

***Strengthening the ties with ongoing initiatives on fire research and management within the region:***

***Collaborative fire information, resource sharing, training and research in support of integrated fire management in Southern African countries***



Report prepared by Navashni Govender (steering committee member of SAFNet) & Anja A. Hoffmann (Regional Fire Network Coordination)

## ACKNOWLEDGMENTS

The major funders for this meeting include START (System for Analysis, Research and Training), TAFORI (Tanzania Forestry Research Institute) and GIZ (German International Co-operation) in the framework of the Trilateral Cooperation project on Integrated Fire Management in Tanzania are gratefully acknowledged.

We are thankful for the assistance provided by the GOFC-GOLD proposal team in sourcing START support and the role played by Skip Kauffman and his team at START in approving and facilitating access to the funds. All flight arrangements were done by Chris van Dyke from EWA Travel in Washington DC.

Special thanks are given to the TAFORI logistic team, headed by Lawrence Mbwambo. In particular we are grateful to Siima Bakengesa from TAFORI and Charles Ng'atigwa from the Tanzania Forest Services for all the effort that they put into the great success of this meeting.

Finally I would like to thank Anja Hoffmann the Regional Fire Network Coordination for all her inputs (academic, logistical, on the ground presence, meeting co-ordination and lots more that she did) to ensure the success and productivity of the meeting.

## EXECUTIVE SUMMARY

The Southern Africa Fire Network (SAFNet) held its ninth meeting at the Tanzania Forestry Research Institute (TAFORI) in Morogoro, Tanzania, from the 5-7<sup>th</sup> February 2013. The overall theme of the meeting was **“Strengthening the ties with on-going initiatives on fire research and management within the region: Collaborative fire information, resource sharing, training and research in support of integrated fire management in Southern African countries.”** The workshop was attended by approximately 60 delegates representing 12 countries (Gabon, Germany, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Lesotho, Zambia and Zimbabwe).

The overall objectives of the meeting were (1) To foster cooperation and collaboration between fire science and operational fire management within the region, (2) To increase awareness and information on ongoing fire initiatives and latest fire research and (3) To promote a forum for informed communication on fire related issues within the region.

The 3 day meeting comprised of presentations, a panel debate session, a participatory group work session and a field trip to the Morogoro community that received FIREWISE training within the framework of the GIZ Trilateral fire management project.

Key outcomes from the meeting were as follows:

### 1. The feedback session on the AMSED project in the region.

- Each country representative presented the status of the AMSED project in their country, how the project is being used and the successes, challenges and improvements of the project. The **successes** of the project were that there was improved access to fire data and statistics (FDI, burnt area, fire frequency, etc.), the help desk function, the AMSED product can be used in a variety of ways and the continuation of the project through MESA. Key **challenges** faced were unclear use of the FDI, more training (but not only for the IT sector but also how can the end user use the information), burnt area does not cover the entire region. **Improvements** to the product included more FDI research and applications, clear understanding of the use of VIRRS sensor, algorithm development of active fire aggregation, Text file for accumulated daily, monthly data etc and Improve dissemination of results. Information and products to all levels (the product makers, grass roots and policy makers)

### 2. Fire Abatement Programs for carbon sequestration - are they a solution for Africa?

- There is currently strong international pressure to reduce fire frequency and increase early-season burns in woodlands as a method to store carbon. These “fire abatement programs” are already in progress in Australian savannas. On the other hand, in certain parts of Africa there is much concern over encroaching woody vegetation and land managers are exploring the use of “fire storms” as a method to knock back woody growth and maintain a functioning open savanna ecosystem. The pros and cons of each option was discussed and if these Fire abatement programs for Africa: when, where and why?” were debated. Most people agreed fire is an integral part of savanna/woodland ecosystems in Africa but still many conflicting ideas about how it should be applied. There was No one answer to this question, as both issues are important and exist in Africa. We need more hot fires to address the issues of bush thickening and in areas we need more ES fires to break up the fuel load and to reduce the areas burnt in LS fire. In these areas the carbon credit can be addressed. But there is not just one option and people need to realise that.

### 3. Capacity building requirements in the region

- In order to determine what are the training and capacity requirement in the region a group work session was held where all delegates discussed and listed their needs. Key and common training needs highlighted were (1) Fire Danger Index – training and understanding of the concept, the use of the information and dissemination of the FDI, (2) Training of fire information dissemination. The AMESD system gets the data and products but how can the product and information be taken to the end users, (3) Writing of Fire management plans, (4) Long term research - Collection of research data – raising awareness of the long term impacts of fire. How to do fire experiments. Research and best practices and data to collect and (5) Project proposal writing skills. The onus is now on the Network and its members to go out and source funds and write proposals to address these training needs.

### 4. Evaluation of the meeting

- A questionnaire was given to all delegates to briefly evaluate the meeting and assist the organizers in receiving comments to improve for future meetings. The meeting was very well received by all delegates. Most of the delegates felt that the content of the meeting ranged from excellent to good but gave suggestions for improvements. Topics for the next meeting were fire research and long term fire monitoring - how is the data used, role of communities in decision making, GIS/RS practical training, Information dissemination - to all stakeholders and fire management plans - use of data, writing and implementation. The meeting was also useful to more than 98% of the delegates who attended and the key reasons for that was that the meeting provided fire networking opportunities, exposed delegates to GIS and RS techniques for fire management and received updates on AFIS/RS and AMESD - success and challenges. Finally the major take home messages for delegates from the meeting were (1) Communication is key at all levels, (2) Networking and collaboration is important, (3) Need for Fire Management plans (4) fire is both good and bad and (5) we need to involve the communities in any and at all fire decision levels.

### 5. Future of the Network

- SAFNet Steering committee will remain the same. Philip Frost – South Africa (PFROST@csir.co.za), Navashni Govender – South Africa (Navashni.govender@sanparks.org), Wisdom Dlamini – Swaziland (mwdlamini@gmail.com) and Gift Sikaundi – Zambia (giftsikaundi@yahoo.com).
- The current website is based at <http://afis.meraka.org.za/safnet>. Gift Sikaundi would like to take over the maintenance of the website. This will be discussed.
- SAFNet would like to host its next meeting in 2015 and as per the results from the questionnaire Zambia took top spot followed by South Africa, Mozambique and Botswana. Final location will also be dependent on access to funds.
- Besides the regular biannual meetings a regional workshop shall be organized on "Fire Danger Rating covering issues on the validation of regional and global FDR, FDR theory and application for operational fire management". Collaboration with GOFC Fire IT is sought on this.
- Finally at the next meeting we would like to cover a few of the following topics: (1) A larger training component (GIS/RS), (2) Structure for writing of fire management plans and proposal, (3) fire data collection (fire behavior and effects of fire data) and (4) dissemination of fire information.

## ABBREVIATIONS AND ACRONYMS

AFIS	Advanced Fire Information System
AMESD	African Monitoring of Environment for Sustainable Development
CBFiM	Community Based Fire Management
CEOS	Committee on Earth Observation Satellites
CSIR	Council for Scientific and Industrial Research (South Africa)
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
FDI/FDR	Fire Danger Index/ Fire danger Rating
GOFC –GOLD	Global Observation of Forest and Land Cover Dynamics
GOFC IT	GOFC Implementation Team
GTOS	Global Terrestrial Observing system
IFM	Integrated Fire Management
JFM	Joint Forest Management
MODIS	Moderate Resolution Imaging Spectroradiometer
MESA	Monitoring of Environment and Security in Africa
NPP	National Polar-orbiting Partnership
NASA	National Aeronautics and Space Administration
REDLATIF	The Latin American Remote Sensing and Forest Fires Network
REDD	Reduced Emission from Deforestation and Forest Degradation
RS	Remote Sensing
SAFNET	Southern African Fire Network
SADC	Southern African Development Community
START	Global Change SysTEM for Analysis, Research and Training
TAFORI	Tanzania Forestry Research Institute
TFS	Tanzania Forest Services
VIIRS	Visible Infrared Imager Radiometer Suite

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## 1 Introduction

The Southern Africa Fire Network (SAFNet) held its ninth meeting at the Tanzania Forestry Training Institute (TAFORI) in Morogoro, Tanzania, from the 5-7<sup>th</sup> February 2013. The overall theme of the meeting was “Strengthening the ties with on-going initiatives on fire research and management within the region: Collaborative fire information, resource sharing, training and research in support of integrated fire management in Southern African countries (see Appendix I – Workshop Program).

The workshop was attended by approximately 60 delegates representing 12 countries (Gabon, Germany, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, Lesotho, Zambia and Zimbabwe). The participant from Angola cancelled attendance a few days before the workshop. The REDLATIF coordinator from Brazil could also not attend the meeting as SAA did not accept the Yellow fever certificate in Portuguese language. Delegates were from a range of organisation such as from Government (Policy and fire management implementation) to Conservation and Research (Appendix II – Attendance List).

The 3 day meeting comprised of presentations, a panel debate session, a participatory group work session and a field trip to the Morogoro community that received FIREWISE training within the framework of the GIZ Trilateral fire management project. .

The welcoming remarks and introduction of delegates was undertaken by the director of TAFORI, Mr Lawrence Mbwambo. The meeting was officially opened by the Regional Commissioner of Morogoro Joel Bendera on behalf of Hon. Ambassador Khamis Sued Kagasheki, the Minister of Natural Resources and Tourism. Mr. Wisdom Dlamini Steering committee member for SAFNet thanked the guest of honour on behalf of SAFNet followed by Navashni Govender introducing SAFNet and the objectives of the meeting. The opening session was closed by background information on and overview of GOFC-GOLD by Anja Hoffmann.

### 1.1 Background GOFC- GOLD and SAFNET

Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) is a coordinated international effort working to provide ongoing space-based and in-situ observations of forests and other vegetation cover, for the sustainable management of terrestrial resources and to obtain an accurate, reliable, quantitative understanding of the terrestrial carbon budget. [GOFC/GOLD](#) is operating under the [Global Terrestrial Observing System \(GTOS\)](#) program, which is sponsored by the [Integrated Global Observing Strategy \(IGOS\)](#). The main goal of GOFC/GOLD is to provide a forum for international information exchange, observation and data coordination, and a framework for establishing the necessary long-term monitoring systems. Potential users of GOFC-GOLD products include global change researchers, international agencies, national governments, non-governmental organizations, and international treaties and conventions (such as the Framework Convention on Climate Change). One of the most important challenges facing GOFC-GOLD is to develop methods and implement systems that provide both research and operational information on a regular sustained basis.

The GOFC/GOLD-Fire Mapping and Monitoring Theme is one of the two major themes (land cover) aimed at refining and articulating the international observation requirements and making the best possible use of fire products from the existing and future satellite observing systems, for fire management, policy decision-making and global change research. GOFC/GOLD is promoting self-organized regional networks of data users, data brokers and providers, where closer linkages and collaborations are established with emphasis on an improved understanding of user requirements and product quality. GOFC/GOLD-Fire is pursuing, in a joint effort with the [Committee on Earth Observing Satellites \(CEOS\) Working Group on Calibration and Validation \(WGCV\) Land Product Validation \(LPV\)](#) subgroup, the coordinated validation of fire products by standardized protocols.

### 1.2 GOFC Regional Networks- SAFNET

To execute and design projects, develop consensus algorithms and methodologies for fire product generation and validation, the GOFC-GOLD Fire Implementation team works with GOFC-GOLD Regional Networks in Eurasia, Asia, Africa, South and Latin America to bring together fire data providers, users and researchers operating in (or with an interest in) a common geographic area, and represents a link between national agencies, user groups and the global user/producer. The **Southern African Fire Network** is one of the global regional networks that foster collaborative efforts in fire monitoring and management in southern Africa. SAFNet's goal is to achieve more effective and appropriate fire management policies and practices in southern Africa through the use of remote sensing and other geospatial information technology. SAFNet's purpose is to enhance the use of information from field observations and remote sensing of fires for natural resource management in southern Africa.

SAFNet is using small seed funding grants from System for Analysis, Research and Training (START) to conduct on a biannual basis regional network meetings to engage the fire user and management community to address regional and national concerns and issues, to provide a voice for regional and national needs and to foster lateral transfer of technology and methods concerning fire science and management within and between countries. The regular meetings aim further to bring together both the fire science and the practitioner community from the various SADC countries to foster future cooperation and advance dialogue in order to (i) highlight good practice examples, (ii) identify knowledge gaps and needs of both communities, and (iii) join forces and mutually support each regional fire management efforts. The network meetings are being held on a rotational basis in the various SADC countries since 2000. In 2011 the 8<sup>th</sup> SAFNet meeting was held prior to the 5<sup>th</sup> International Wildland Fire Conference in South Africa.

### 1.3 Objectives of the 9<sup>th</sup> SAFNet meeting

Overall objectives are:

- 1) To foster cooperation and collaboration between fire science and operational fire management within the region
- 2) To increase awareness and information on ongoing fire initiatives and latest fire research
- 3) To promote a forum for informed communication on fire related issues within the region.

The specific objectives of the event are:

- 4) Report back and discuss future of the following programs
  - AMSED project – Application of AFIS field stations and user feedback
  - Donor supported Fire Management projects in Tanzania – Lessons learnt and products
  - Regional Fire Coordination Center – Current status and functions Implementation of the SADC fire management program – current status
- 5) Results of the GOFC training Initiative as well as status of Miombo network
- 6) REDD and fire: Fire emission calculations of Tanzania
- 7) Fire Abatement Programs for carbon sequestration - are they a solution for Africa?
- 8) There is currently strong international pressure to reduce fire frequency and increase early-season burns in woodlands as a method to store carbon. These “fire abatement programs” are already in progress in Australian savannas. On the other hand, in certain parts of Africa there is much concern over encroaching woody vegetation and land managers are exploring the use of “fire storms” as a method to knock back woody growth and maintain a functioning open savanna ecosystem. At the meeting we will debate the pros and cons of each option, and determine when and where each approach would be appropriate as a management tool in African savannas and woodlands.
- 9) Discuss and draft joint fire regional projects
- 10) Latest developments in Earth Observation Systems in Fire Monitoring - The Visible Infrared Imager Radiometer Suite (VIIRS) sensor launched aboard the Suomi National Polar-orbiting Partnership (NPP) satellite on October 28<sup>th</sup>, 2011.

## 2 Session 1 – Fire & Fire Management in Tanzania

All presentations from this meeting are posted on the SAFNet website: <http://afis.meraka.org.za/safnet>.

After the official opening, Session 1 on “Fire & Fire Management in Tanzania” started by a presentation by **Nuru Kaniki** highlighting the influence of fire frequencies on stand density and species diversity in miombo woodlands in Tanzania. Information on how fire season and frequency effect vegetation is still insufficiently researched in Tanzania’s Miombo woodlands. **Alfan Rija** from the Sokoine University discussed the fire reduction strategy for Miombe woodland (80%) – for carbon sequestration. Crucial to determine which treatment had the highest C storage – both for Soil and vegetation. Not considering biodiversity elements.

**Charles Ng’atigwa** went through the FireWise approach introduced and adapted to Tanzania conditions within the Technical Cooperation Projects. He mentioned the formation of a interministerial National Task Force in Tanzania which is instrumental to institutionalize integrated fire management in the country with fire issues. **Glynis Humphrey** presented the FireWise RSA and their lessons learned in Tanzania. **Gernot Ruecker** closed session 1 by presenting on Burned Area, Active Fires and Biomass burning – Approaches to account for Emissions from fires in Tanzania by using the Fire Radioactive Power from MODIS.

## 3 Session 2 – Panel Debate Fire Abatement programs

**Sally Archibald** introduced the topic “Fire abatement programs for Africa: when, where and why?” for a panel debate. Africa has always faced conflicting ideas about how we should burn our landscapes. European colonists saw fire as bad – to be stopped at all costs however, this clashed with ideas of local people who used fire for all sorts of management purposes. Most people agree fire is an integral part of savanna/woodland ecosystems in Africa but still many conflicting ideas about how it should be applied. The two sides are (1) New issue: fire management for earning carbon credits: “fire abatement” and the potential to earn money by reducing fire and promoting an increase in tree cover (2) Old issue: bush encroachment a problem for farmers and rural people who need open grassy land for grazing and other resources. The two land management approaches were introduced by **Kathryn Jeffery** presenting on option 2) Using fire to PREVENT tree encroachment to conserve a valuable savanna ecosystem in Gabon in a protected area and **Robin Beatty** introducing on option 1) managing fire in Southern Africa to promote local livelihoods AND global carbon objectives.

After the presentations were made a panel debate was held involving **Navashni Govender** (South Africa), **Gift Sikaundi** (Zambia), **Ntandokamlimu Nondo** (Zimbabwe), **Richard Kapere** (Uganda) and **Wisdom Dlamini** (Swaziland) giving their views. Thereafter the floor was opened for discussion.

**Richard** – from Wildlife Authority in Uganda – no go area once a National Park but surrounding the NP the areas are burnt. The park just waits for the wildfires and then they must fight them. Due to this parks that were previously savanna parks have closed up. Animals move out and now being poached. Need more fire and to know what is happening during the fire, what comes after the fires. Need

resources and capacity and equipment and Uganda resources are limited and prioritized and wait for the wildfires.

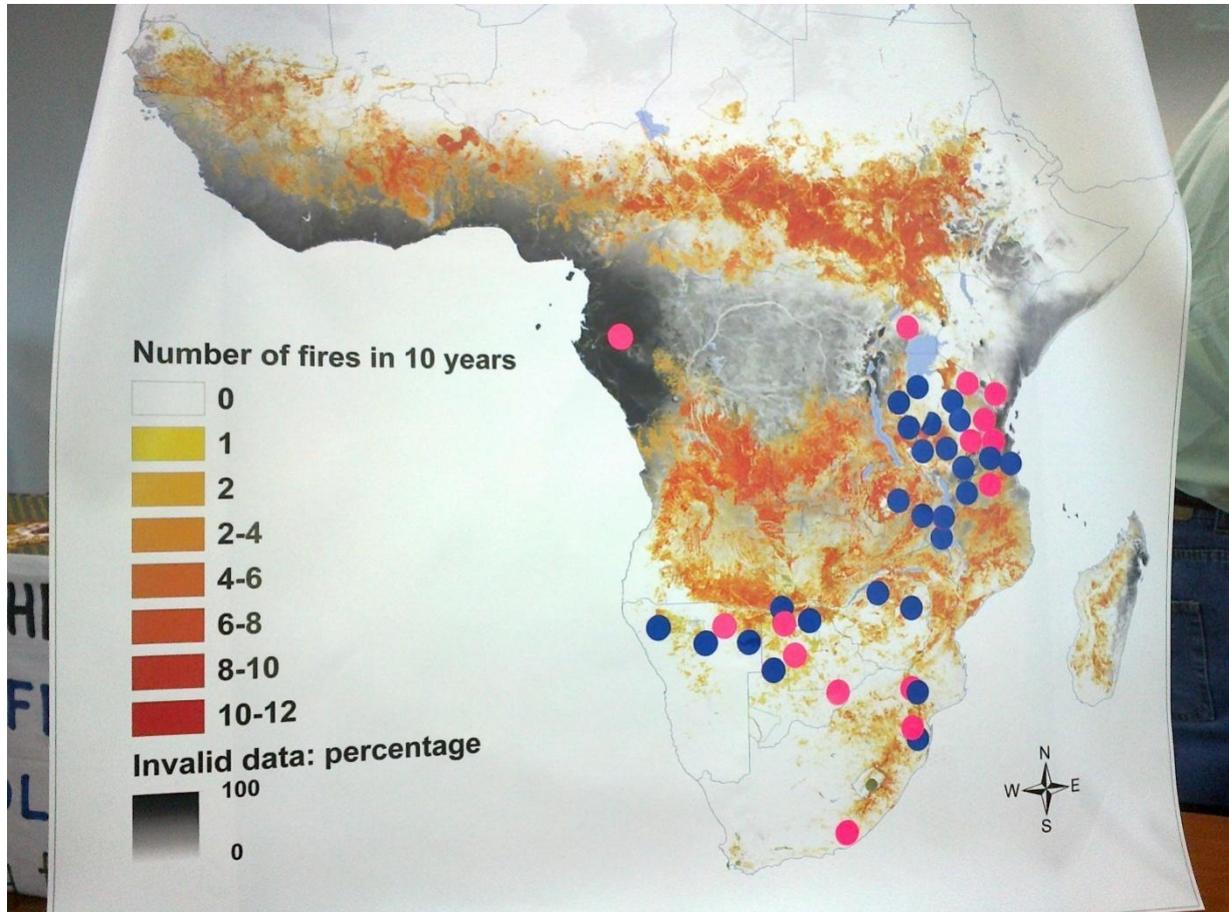
**Nondo** – Zimbabwe has legislation to manage fire. In conservation areas fire is used to control biomass and increase biodiversity. Early Season (ES) fires not promoted in the communities, but have had requests for permission to do ES fires to reduce biomass to reduce the wildfires late in the season. Need more research and to advise as to if they need to burn. How much fire is enough and at what stage is enough. There is too much of late season fires and need more ES fires.

**Gift** – Zambia – government owns 7% of the land. 93% cannot be subjected to traditional burning practices. Law allows ES fires for only 7% of the area. The rest of the land there are no laws. Zambia has fires that burn throughout the year. If you see a fire, no need to do anything, it is normal and part of living. National Parks and other protected areas where they can do things, they still have fire throughout the year, due to the fact that they are close to other lands use. No mandate to fight bush fires. No personal to assist. Too much fires in the country and need some control measures to reduce the fires.

**Wisdom** – Swaziland, fire suppression in the law. Have issues of encroachment and loss of rangeland. Livelihoods have been affected due to loss of grazing. Suppression has led to a reduction of biodiversity. Mid to late season fires are the destructive fires on the western side of the country. Fire majorly affects the forest plantations. Take into account the land use and ecosystem processes.

**Navashni** - No one answer to this question, as both issues are important and exist in Africa. We need more hot fires to address the issues of bush thickening and in areas we need more ES fires to break up the fuel load and to reduce the areas burnt in LS fire. In these areas the carbon credit can be addressed. But there is not just one option and people need to realise that.

A participatory exercise that asked the question “Which parts of Africa need less intense/less frequent fires, and which parts need to burn more frequently/intensely” Delegates could use coloured dots to illustrate this on a map (Figure 1). There was a strong push for more ES burns and need lots of people



**Figure 1 Map of southern Africa with the 10 year fire frequency data from MODIS.**

Delegates were asked to use the (pink dots) to note areas in southern Africa which needs to burn more frequently/intense and which parts of Africa need less intense/less frequent fires (blue dots).

## 4 Session 3 – Feedback on AMESD project and the AFIS fire Service

Farai Marumbwa (Botswana) gave an overview on the status and future of the African Monitoring of the Environment for Sustainable Development (AMESD) initiative launched in 2007 and funded by European Development Fund. AMESD makes use of Earth Observation technologies and data to set-up operational environmental and climate monitoring applications. AMESD provides the five regional Economic Communities in Africa with operational geo-information services to support and improve the decision making process in the field of environmental management facilitated through the internet free access of data and information derived from earth observation technologies mainly through the AMESD – EUMETCAST receiving stations. In the SADC region, the thematic action on “Agricultural and Environmental Resource Management” provides three main services: (1) Agricultural Service, (2) Drought Service and (3) Fire Service. The fire service is based on the Advanced Fire Information System (AFIS) of CSIR South Africa. The AFIS field terminal as part of the AMESD thematic stations is built on the fast option for indirect data transmission to areas with no fast internet access offered through the GEONETCast network. AFIS is a satellite based fire information tool that enables the user to receive the MODIS active fire data, MODIS burned area data, MODIS True/False color composites, MSG ABBA active fire data, Canadian Fire Weather Index (3 day forecast), Lowveld Fire Danger Index (3 day forecast).

New technical developments on AFIS within AMSED (and in the future Monitoring of Environment and Security in Africa /MESA) and projects were given by Riaan van den Dool (South Africa). Thereafter presentation from the following countries (Malawi, Lesotho, Namibia, Botswana, Swaziland, Zambia, Tanzania, Uganda and Zimbabwe) highlighting the AMESD project. T

Participants were asked to share their experiences regarding Successes, Concerns and Improvement factors for the AMSED project. Table 1 gives a summary of the most often highlighted topics. All comments are given in Appendix III.

**Table 1: Summary of comments received from delegates on the successes, concerns and improvements of the AMESD project.**

SUCCESSES	CONCERNS	IMPORVEMENTS	General comments
Good examples of the use of the AMESD product	Unclear use of the FDI	More FD research and applications	More research on the integration of fire management with livelihoods
Allows for improved access to fire data and statistics	Not enough capacity building and training (all levels)	training on the application of VIRRS	research on communities attitudes to fire management and the approaches
Help desk support	Burnt area does not cover all countries	algorithm development of active fire aggregation	Assistances with the development of fire management plans
Project allowed for good capacity building	Community involvement not included	Text file for accumulated daily, monthly data etc.	
AMESD products can be used in a variety of ways - developing fire management plans, FDI and early warning, giving fire data to the region, the rain and agriculture data	User interface you have to import your data to other systems	more emphasis on the validation of the product (biomass, FDI, etc.)	
Strengthening of policies and information to policy makers	Few people have adopted the technology	Improve dissemination of results. Information and products to all levels (the product makers, grass roots and policy makers)	
Including Flood into MESA		More capacity building (RS, GIS, use of information)	
Networking expansion		Development of fire risk maps	
		Extend AMSED to regions and districts (Ipad, android and pda)	

## 5 Session 4- Group work – Regional Capacity Developments

Before the working groups **Natasha Ribeiro** informed about the status of the Miombo network, the sister network of GOFC- GOLD under the land cover theme. The network will hold a meeting in July 2013 to revive the long dormant but formerly very active network again. Thereafter the concept, vision and mission of a regional fire management center was introduced by **Glynis Humphrey**. The morning session was closed by an Introduction inot VIIRS by **Gernot Ruecker** given on behalf of the VIRRS team.

After tea break the working session started. For this session, delegates were asked to work in their break away groups. The groups were then given the questions in Appendix IV to answer and contribute to the development of regional network projects or training ideas. Due to time constraints we were only able to address questions 1 and 3.

*Question 1: List possible capacity building projects that will improve your fire management knowledge required in your country to support your fire decision making skills?*

- a) GIS projects – give specifics
- b) Remote sensing projects – give details
- c) Effect of fire projects (environmental, social, community) – details required

### THE FOLLOWING TRAINING REQUIREMENTS WERE NOTED:

1. Fire Danger Index – training and understanding of the concept, the use of the information and dissemination of the FDI
2. Training of fire information dissemination. The AMESD system gets the data and products but how can the product and information been taken to the end users.
3. 2 way communications - GIS product interpretation to the end user and get the traditional knowledge and information.
4. Writing of Fire management plans
5. GIS training on open software – QGIS (do not spend money on licenses)
6. Get universities to teach a fire ecology/management course
7. Long term research - Collection of research data – raising awareness of the long term impacts of fire. How to do fire experiments. Research and best practices and data to collect
8. Project proposal writing skills

**Question 2: Are there any community based fire management (CBFiM) programs that you know of in your country?**

a. What are they and explain/elaborate on the program?

**Table 2: CBFiM efforts in your country**

Country	Remarks
Tanzania	<ol style="list-style-type: none"> <li>1. Involving villages in prevention &amp; fire fighting supported by Jane Goodall Institute in Kigoma area</li> <li>2. Introduction and adaptation of FireWise concept via South Africa</li> <li>3. Fire management are dealt with under the concepts of Participatory Forest Management (PFM) or Joint Forest Management (JFM)</li> <li>4. Legally there are no registered CBFiM programs, but fire mgt is dealt with by CBFM under village environmental committee responsible for overseeing forest management in collaboration with other stakeholders</li> <li>5. CBFiM, fire crews, environmental committees, by laws, communication strategy designed, study on local knowledge on fire. But no implementation</li> <li>6. Implementation is done on various NGO's such as Tanzania Forest Conservation Group, Jane Goodall etc.</li> </ol>
Namibia	<ol style="list-style-type: none"> <li>1. Integrated Rural development &amp; Nature Conservation, Community Forests for North Eastern Namibia</li> <li>2. CBFiM conservancies/concessions, hunting concessions, CBFiM FMP training</li> </ol>
Botswana	<ol style="list-style-type: none"> <li>1. Involvement of communities in prevention &amp; suppression based on the Herbage preservation act, Development of fire management plans in selected communities/areas (Mababe/ Khama Rhino)</li> <li>2. 911 Centre – detection &amp; combating fires</li> </ol>
Mozambique	<ol style="list-style-type: none"> <li>1. Niassa National Reserves, community in ??? (card could not be read), Define priority areas for management – not implemented</li> <li>2. Potone Forest Reserve, `30,000ha in 2011 controlled burning, communities in and around reserve, Care/WWF &amp; 321 Fire reducing wildfire, enhancing land use &amp; environment</li> </ol>
South Africa	Fire Protection Associates: only active when the land owner perceives a risk from fires
Zambia	Farmers associations formed to fight fires in their farming blocks as well as putting in place management plans
Gabon	No CBFiM
Zimbabwe	Campfire initiative integrated into local authority operations
No country could be assigned	<ol style="list-style-type: none"> <li>1. Village Natural Resource Management Committees – integrates fire activities (TZ?)</li> <li>2. The institute provides training &amp; equipment, integrate indigenous &amp; modern technologies in fire fighting/ management</li> <li>3. Private public partnerships, all stakeholders contribute to fire</li> <li>4. Laws and by-laws explicitly explain on FM issues</li> <li>5. Integration of fires in forest plantation and national parks, range lands</li> </ol>

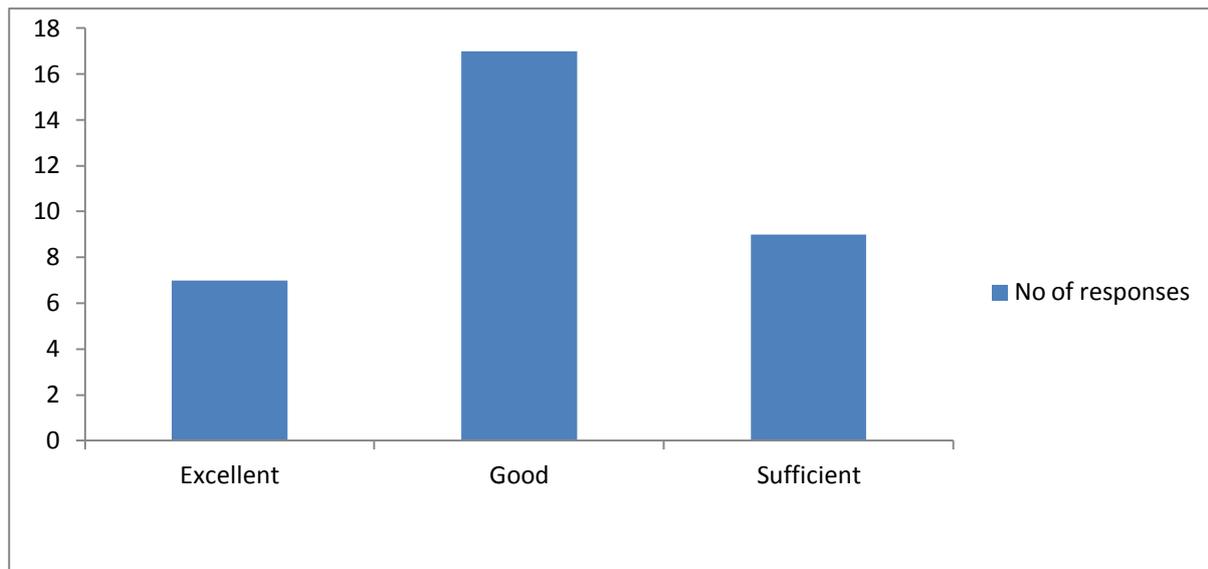


**Figure 2: The different groups discussing the two questions that were given**

## 6 Evaluation of Meeting

A questionnaire (Appendix V) was given to all delegates to briefly evaluate the meeting and assist the organizers in receiving comments to improve for future meetings. Below are the results from the questionnaire.

### *Comment on the content of the meeting and provide suggestions to improve the next meeting?*



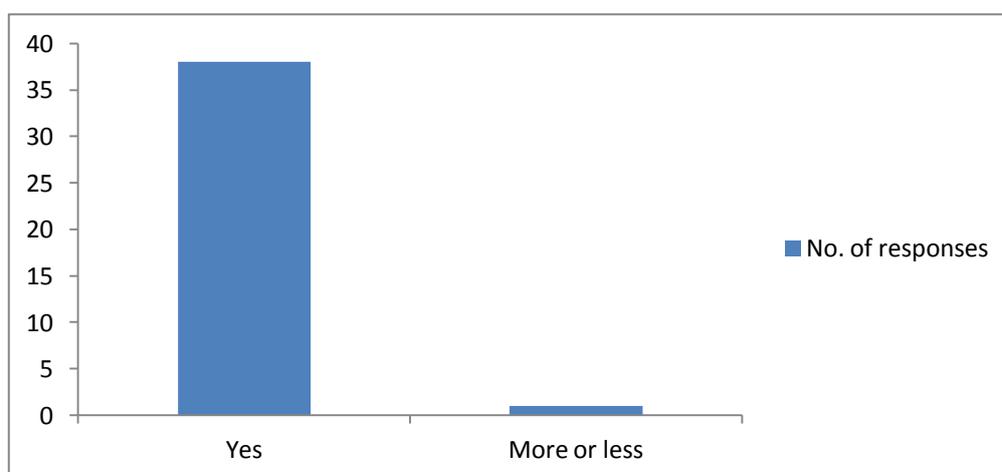
### *Questions to improve the next meeting*

- 1) Many thought that there was valuable feedback on AMESD and AFIS
- 2) 5 delegates wanted a practical session (no topic given)
- 3) More information on the following topics:
- 4) Presentations on efforts by the countries to reduce fire effects
  - How the end products are being used in each country
  - The fire issues and implementation per country
  - Compare CBFiM with other countries and research
- 5) Information dissemination strategy – to grassroots/researchers/managers/policy makers
- 6) Attendance of more fire ecologists and RS people
- 7) More fire research presentations
- 8) More technical presentation of RS application
- 9) Increase the number of days for the meeting
- 10) Require abstracts to be sent out prior to the meeting

### *What topics should be emphasized at the next meeting?*

Topic	No of requests
- Communication of Science	1
- How AMESD improves fire management in each country	1
- fire in context of climate change	1
- How AMESD and AFIS is used, interpretation and research	4
- role of communities in decision making	6
- practical training - GIS and RS	5
- training on extinguishing fire and resources	
- IFM	2
- Information dissemination - to all stakeholders	5
- fire research and long term fire monitoring - how is the data used	6
- fire management programs in the region	1
- Early warning systems	1
- Best Operating Procedures for fire implementation	4
- socio-economic information associated with fire management	1
- fire management plans - use of data, writing and implementation	4
- fire induced land cover changes	1
- translating fire information into decision making/policy and ground operations	1
- FDI	2
- fire emissions and carbon calculations	2
- vegetation monitoring	1
- feedback from end users of the fire information	2
- MESA	1
- community level capacity building	1

### Was the content of the workshop useful to you and how?

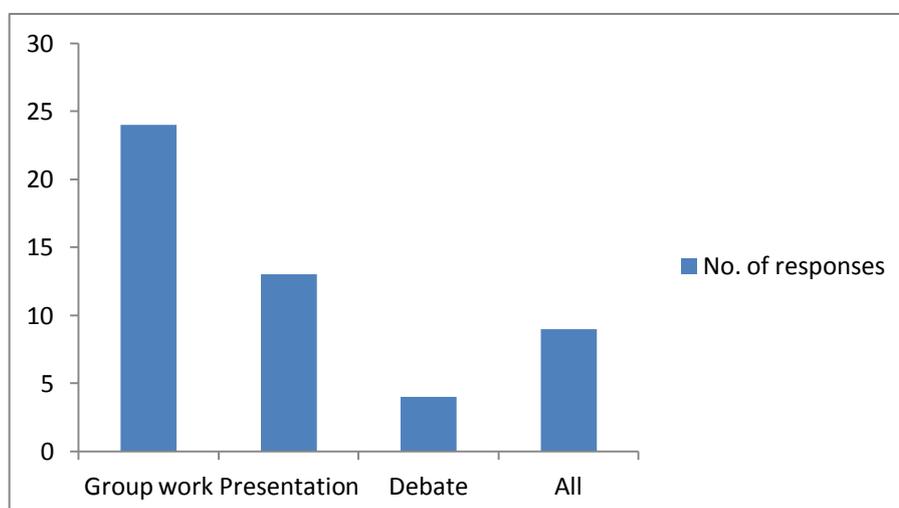


Why was the meeting useful	No of requests
- received updates on AFIS/RS and AMESD - success and challenges	4
- identified fire issues that are similar in many countries	1
- learnt that information must be shared and not kept	1
- RS and GIS must be validated	1
- Used the meeting as fire networking opportunities	7
- Learnt about fire management and GIS in other SADC countries	1
- Exposure to GIS and RS techniques for fire management	7
- More training is required (GIS/RS)	1
- Noted the different fire regimes/attitudes/information in the various countries	3
- Learnt about the difficulties for information dissemination	1
- need to involve communities in fire decision making and plans	1
- Insight into fire monitoring	2
- Feedback on the AMESD	1
- Ideas on effective fire management	2
- Software product information	1
- data analysis for planning purpose	1
- Introduced to fire abatement programmes	2
- learnt that one can obtain fire information from his country and this is available	1
- Learnt about the FDI and early warning system	1
- Want more fire experts	1

*What is the one take home message from the meeting that you have noted?*

Take home message	No of delegates
- Communication is key at all levels	9
- Networking and collaboration is important	7
- GIS officers must share their information	2
- GIS and RS for fire research and fire management	3
- Various fire technologies	3
- Fire is also an important tool to control wildfires	1
- fire is both good and bad	5
- Need for FM plans	7
- how to involved communities in fire management	4
- Lack of information dissemination at all levels	3
- No end user feedback and this is important	2
- Fire is a problem in SADC	2
- More training of GIS and RS software	2
- Need to establish a link with the country focal points to use the info	1
- Fire fighting needs real commitment and cooperation	1

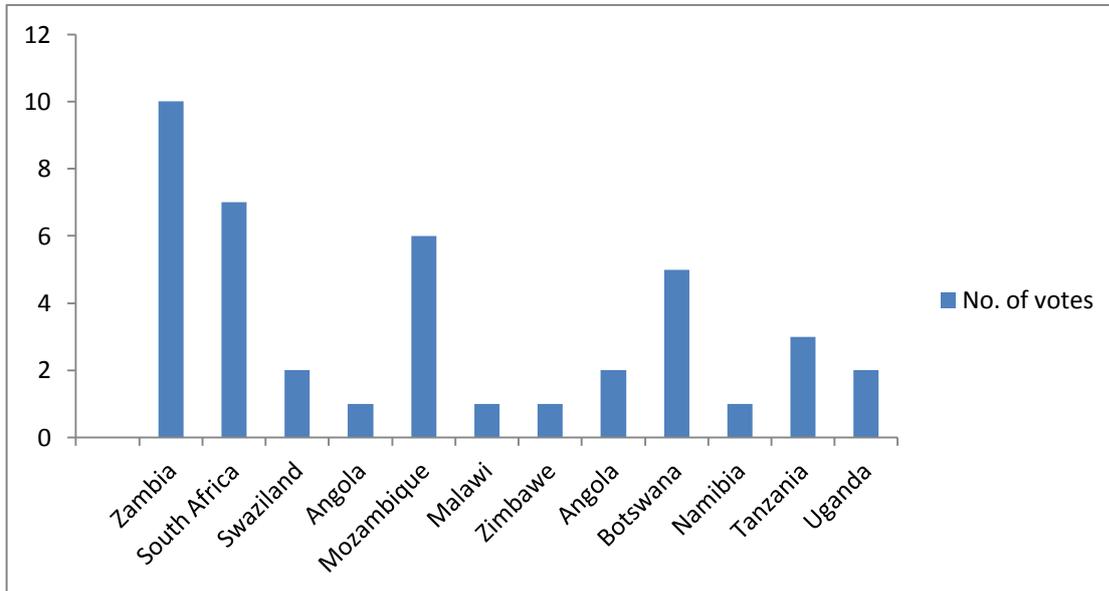
*Comment on the structure of the workshop (debate/group work/presentations)? Which format was most useful to you and why?*



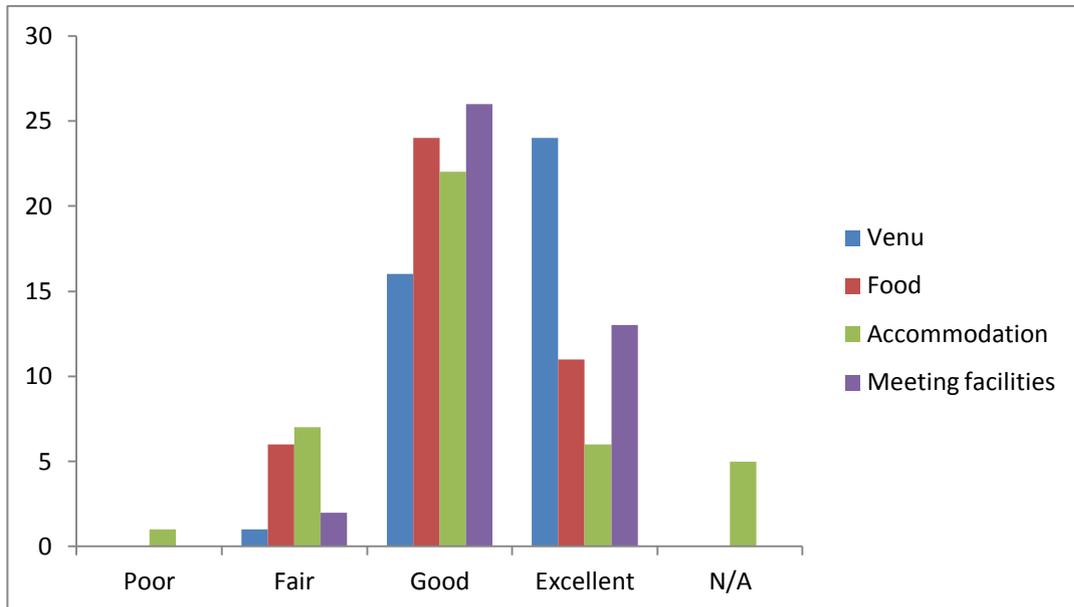
Other comments included:

- 1) Fewer break away groups
- 2) Able to get more information from the delegates
- 3) Encourages more discussions from the delegates from other countries around the table
- 4) Learn from other peoples experiences

*Suggest location of the next meeting (country)?*



*Rate the following aspects of the meeting?*



## 7 Field trip – Morogoro FireWise Community

A visit to a community nearby Morogoro was arranged by TAFARI and TFS. The community received training in FireWise awareness and education within the framework of the GIZ Trilateral cooperation project on Integrated fire Management in Tanzania. The community members reported in an interactive question and answer session about their experiences with the training and its application.



Figure 3: Visit to Community that received FireWise training

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# Appendix 1

## Workshop Programme

The programme will be managed flexibly and adaptively to accommodate the interests of the group and to make maximum use of the time and energy of the participants. In case there are other priority areas coming up during the workshop, changes will be taken into consideration.

<b>8 Monday, 04 February 2013</b>	
13:00 – 17:00	Travel from Dar es Salaam To Morogoro
<b>9 Day 1: Tuesday, 05 February, 2013</b>	
<i><b>OPENING SESSION:</b></i>	
08:00 - 09:00	Arrival and Registration at TAFORI
09:00 - 10:30	Welcome remarks and Introduction of Participants <b>Lawrence Mbwambo</b>
	Morogoro Regional Commissioner welcoming participants and Guest of Honour <b>Hon. Joel Bendera</b>
	Opening remarks <b>Hon. Ambassador Khamis Sued Kagasheki, the Minister of Natural Resources and Tourism</b>
	A word of Thanks from SAFNET to guest of honour <b>Wisdom Dlamini - Swaziland</b>
	Objectives and Agenda of the Meeting <b>Navashni Govender</b>
	GOFC-GOLD Background and Regional Networks <b>Anja Hoffmann</b>
	<b>Group Photo with Guest of Honor</b>
<b>10:30 - 11:00</b>	<b>Tea/Coffee Break</b>
<i><b>SESSION 1:</b></i>	
<i><b>FIRE RESEARCH &amp; FIRE MANAGEMENT IN TANZANIA</b></i>	
11:00 – 13:00 Including Q&A	Influence of fire frequencies on stand density and species diversity in miombo woodlands in Tanzania- <b>Nuru Kaniki- TAFORI</b>
	Ecological and Socio-economic influences of Carbon stocking in Tanzania Miombo woodland: initial insights <b>Alfan Rija - Sokoine University</b>
	Community Based Fire Management - Results and Experiences from the Technical Cooperation Projects, Tanzania <b>Charles Ng'atigwa – Tanzania Forest Services</b>

11:00 -13:00	FireWise Tanzania: Lessons learned <b>Glynis Humphrey - South Africa</b>
	Burned Area, Active Fires and Biomass burning – Approaches to account for Emissions from Fires in Tanzania <b>Gernot Ruecker – Germany</b>
<b>13:00 – 14:00</b>	<b>Lunch</b>

<b>SESSION 2:</b> <b>FIRE RESEARCH &amp; FIRE MANAGEMENT IN AFRICA</b>	
14:00 – 15:30 Including Q&A	Fire Abatement Programs for carbon sequestration - are they a solution for Africa? <b>Sally Archibald - South Africa</b>
	Fire management to prevent bush encroachment in a high-rainfall savanna in Gabon <b>Kathryn Jeffery – Gabon</b>
	Fire Abatement Programs – should we be promoting them in African savannas? <b>Robin Beatty – Mozambique</b>
<b>15:30 – 16:00</b>	<b>Tea/Coffee Break</b>
<b>16:00 – 17:00</b>	Plenary Discussion and Wrap up of Day 1
<b>19:30</b>	<b>Reception Dinner at Morogoro Hotel</b>

<b>1 Day 2: Wednesday 06 February, 2013</b>	
<b>SESSION 3: AFRICA MONITORING OF THE ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT (AMESD) PROJECT</b>	
8:30 - 10:30 Including Q&A	Overview, status and future of the AMESD/ MESA project <b>Farai Marumbwa</b>
	Role of AFIS within the AMESD/MESA project <b>Riaan van den Dool - South Africa</b>
	Use of AMESD products and services in Tanzania <b>Kekilia Kabalimu - Tanzania</b>
	The use of AMESD data for effective and efficient Fire management Planning for Uganda's National Parks <b>Richard Kapere - Uganda</b>
<b>10:30 - 11:00</b>	<b>Tea/Coffee Break</b>
11:00 – 13:00	Fire incidences and damage analysis for Zambia's forests and national parks <b>Gift Sikaundi - Zambia</b>
	Socio-economic aspects of fire as revealed by MODIS and GIS analyses: some policy implications <b>Wisdom Dlamini - Swaziland</b>
	Has the use of AMESD data improved Fire management in Botswana? <b>Jeremiah Ramonthso - Botswana</b>
	The use of AFIS data for fire monitoring and mapping in Namibia <b>Paulus Shikongo - Namibia</b>
<b>13:00 – 14:00</b>	<b>Lunch</b>
<b>SESSION 3: CONTINUE AMESD PROJECT</b>	
14:00 – 15:30	Use of Remotely Sensed data to monitor and manage fires in Zimbabwe <b>Ntandokamlimu Nondo - Zimbabwe</b>
	AMESD in Lesotho: Towards a Fire Management Strategy <b>Qongqong Hoohlo - Lesotho</b>
	AMESD Project: The Department of Forestry's Fire Station <b>Aliko Munyenembe - Malawi</b>
<b>15:30 - 16:00</b>	<b>Tea/Coffee Break</b>

16:00-17:30	<p>Recap and synthesis of the Sessions: Common understanding of the critical issues, success and failure factors of using satellite based fire information for operational fire management, feedback for improvements on the AFIS field station</p> <p style="text-align: center;"><b>Anja Hoffmann</b></p>
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## 2 Day 3: Thursday 07 February, 2013

### SESSION 6:

#### **GOFC NETWORKS & REGIONAL CAPACITY DEVELOPMENT**

08:30 – 09:30	<p>Relaunching the Miombo Network: the importance of synergies among networks in Southern Africa</p> <p style="text-align: center;"><b>Natasha Ribeiro - Mozambique</b></p>
	<p>Short Introduction to VIIRS</p> <p style="text-align: center;"><b>Gernot Ruecker</b></p>
09:30 – 11:00	<p><b>Group Work on Regional Capacity Building Measures</b></p> <p>Tea/Coffee Break incorporated into working groups</p>
11:00 -12:00	<p><b>Report back from each group and Way forward to regional capacity building projects</b></p>
12:00 -12:45	<p>Report back from 8<sup>th</sup> SAFNet meeting, modalities of future Network cooperation, next meeting &amp; 2013 meeting evaluation</p> <p style="text-align: center;"><b>Navashni Govender - South Africa</b></p>
12:45 -13:00	<p>Closing of the meeting</p> <p style="text-align: center;"><b>Gift Sikaundi – Zambia</b> <b>TAFORI</b></p>
<b>13:00 -14:00</b>	<b>Lunch</b>
14:00 – 17:30	<b>FIELD VISIT TO FIREWISE COMMUNITY</b>

## 3 Day 4: Friday 08 February, 2013

**Departure from Morogoro Hotel at 07:30 for Airport in Dar**

## Appendix 2

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# Meeting attendance List

Na.	NAME	COUNTRY	E-MAIL ADDRESS
1.	Kapere Richard	Uganda	<a href="mailto:rkapere@yahoo.com">rkapere@yahoo.com</a>
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47.	Hadji Hatibu	Tfs-lake zone	<a href="mailto:hadji-hatibu@yahoo.com">hadji-hatibu@yahoo.com</a>
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57.	Steve Ball	Cta-kilwa masoko	<a href="mailto:steve.ball@mpingoconservation.org">steve.ball@mpingoconservation.org</a>

## Appendix 3

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# All comments received from delegates on the AMESD feedback

No	SUCCESES	CONCERNS	IMPORVEMENTS
1	Isolation of fires by lands use, eg protected areas and forests	Not enough capacity to analyse and apply	Distance education is not useful for AMESD capacity building
2	Has policy level commitment	communication from product to stakeholders	Capacity building needed
3	Verification with AFIS online data	project has failed to make the link between decision makers and field staff	To develop algorithm to aggregate the active detections
4	availability of fire management plans	Coarse scale: difficult for managers to use	availability of support after development of fire data ought to be improved. No point in generating data and not using it
5	Development of fire management zones	User interface: lack sufficient background and baseline data	more that focal point needs to receive training
6	Including Flood into MESA	Extend AMSED to regions and districts (Ipad, android and pda)	Training on the application of VIRRS
7	help desk support	Canadian FDI does not cover the whole of Tanzania	Application of FDI messages
8	Useful but not accurate	Useful but not accurate	More research
9	Networking expansion	Lack of feedback from fire occurrence are to the F.P (one way information)	Support of FDI
10	Capacity building	Lack of data sharing between stakeholders (from National to local level)	Application at grass root levels of technologies
11	Awareness	Information communication to the stakeholders is poor.	The software and tools should be improved to provide information which are accurate and convient
12	Training	Lack of implementation of fire management plans	networking of E-station display computer to other computers of other offices even beyond (to other institutions) which can make use of the information
13	Real good data dissemination	Technology/access and knowledge available to few countries	development of fire risk maps at local levels
14	EW data now available	Few people have adopted the technology	develop evacuation plans
15	Really interesting use of AMESD fire data products - FDI and season of burning data	Paucity of information revealing the contribution of FDI in fire management	Dissemination of results in a user friendly manner
16	Efficient use of AMESD products in fire management planning - Namibia	Burn area image does not cover all countries	Area of coverage to be increased to get more info on fire events
17	Agricultural info and current rain relative average is very useful	The community involvement in fire management is less emphasized	fire prediction and fire forecasting
18	making fire data relevant to social , economical and political issues - did a fabulous job	Unclear usage of FDI	What do people do with the FDI information when they have it
19	good examples of utilization of data from Namibia	Lack of satellite burn methodology available for fire mapping in countries with high level of cloud cover	most of your data is climate data. How good are these data for Africa Can we try out them
20	Active fire detection and post fire assessments	FDI data problem makes sense. It should be possible to overlay places that never burn and delete them	Re-think Dissemination Strategy



21		difficult for fire managers to use	No interface for fire forecasting experts and policy makers. Training like this should include policy and decision makers
22		FDI - what is it and how should we use it	
23		links between the decision makers and the people on the ground	develop indicators to judge the success of the project
24		technical issues - burn area does not cover all countries	Development of fire risk maps
25		User interface you have to import your data to other systems	New developments

## Appendix 4

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# Group Work Session

**Group Work Session**  
**Regional Capacity Building Measures for Science Support**

Number of group: 5

Number per group: 8 to 10

Select the following people within the group:

1. a person to facilitate the discussion
2. a person to take notes and write
3. a person to report back to the meeting

Questions:

2. List possible capacity building projects that will improve your fire management knowledge required in your country to support your fire decision making skills?
  - a. GIS projects – give specifics
  - b. Remote sensing projects – give details
  - c. Effect of fire projects (environmental, social, community) – details required
3. List possible fire partnerships/collaborations that you are aware of or would like in your country?
  - a. Who are the partners?
  - b. What is the nature of the collaboration?
  - c. Explain and elaborate on the type of partnership, the outputs and usage of products?
4. Are there any community based fire management (CBFiM) programs that you know of in your country?
  - a. What are they and explain/elaborate on the program?

## Appendix 5

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# Participant Questionnaire



## Participant Questionnaire

<sup>9<sup>th</sup></sup> Southern African Fire Network (SAFNet) Meeting, Morogoro, Tanzania

4<sup>th</sup> -8<sup>th</sup> February 2013

- 1) Comment on the content of the meeting and provide suggestions to improve the next meeting?
  
- 2) What topics should be emphasized at the next meeting?
  
- 3) Was the content of the workshop useful to you and how?
  
- 4) What is the one take home message from the meeting that you have noted?
  
- 5) Comment on the structure of the workshop (debate/group work/presentations)? Which format was most useful to you and why?
  
- 6) Suggest location of the next meeting (country) and reasons why?
  
- 7) Rate the following aspects of the meeting? List suggestions for improvement?

Venue	___ Poor	___ Fair	___ Good	___ Excellent
Food	___ Poor	___ Fair	___ Good	___ Excellent
Accommodation	___ Poor	___ Fair	___ Good	___ Excellent
Meeting facilities	___ Poor	___ Fair	___ Good	___ Excellent