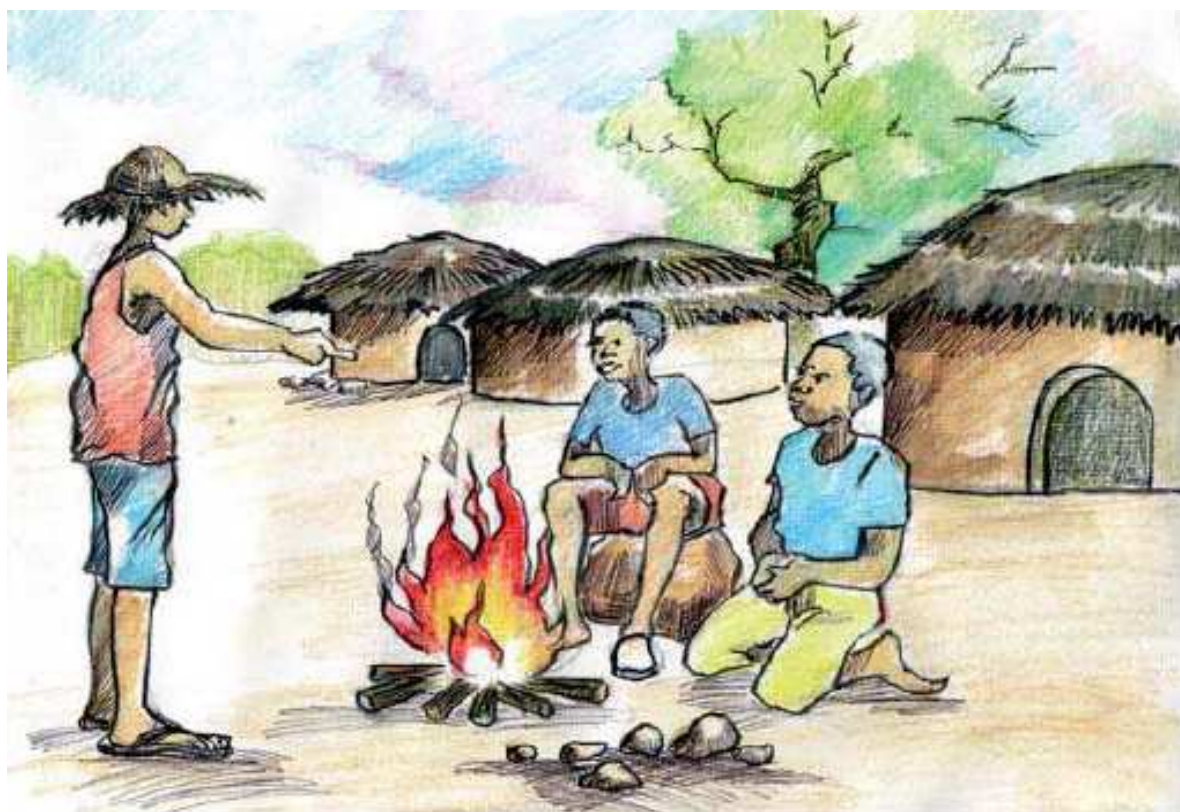




FINAL TECHNICAL REPORT

“FIRE-MANAGEMENT AND POST-FIRE RESTORATION WITH LOCAL COMMUNITY COLLABORATION IN GHANA”



SUBMITTED BY

**The International Union for Conservation of Nature (IUCN)
In Collaboration with the Forestry Research Institute of Ghana (FORIG)**

August 2011

Table of Contents

List of Tables and Figures	3
Tables	3
Figures	3
Abbreviations	4
Executive Summary	5
1.1 Project Abstract	5
1.2 Presentation of Report	7
Section 1	8
Main Text of Technical Project Achievements	8
1.1 Output 1: Relationship between utilization of resources by rural communities and effective fire management determined	8
Activity 1.1 Collection of socioeconomic and environmental baseline data in pilot communities	8
Activity 1.2 Inventory of the key natural resources used by local communities	10
1.2 Output 2: Roles and responsibilities of key stakeholders in fire management determined	16
Activity 2.1 Identification of all relevant stakeholders and determination of their roles and responsibilities	16
Activity 2.2 Organization of yearly stakeholder workshops, and	19
Activity 2.3 Training of stakeholders to meet their roles and responsibilities in fire management	19
1.3 Output 3: Mechanisms for effective community based fire management developed and implemented	20
Activity 3.1: Inform rural communities about existing fire policies and laws	20
Activity 3.3: Facilitate the implementation of community based fire management	20
Activity 3.4: Create awareness on radio, local bulletins, and through other means	20
Activity 3.2: Develop a manual of procedures for community based fire management	22
1.4 Output 4: Fire degraded areas rehabilitated by using valuable species as determined by local communities	23
Activity 4.1: Identification of (candidate) appropriate species for rehabilitation by local communities	23
Activity 4.2: Development of tools and practices from existing, and if necessary, new research into fire ecology ...	23
1.5 Output 5: Gaps in existing legislation, on community based fire management identified and disseminated	27
Activity 5.1: Review of legislation on community based fire management, including land-use	27
Activity 5.2: Validation of legislative gaps during a workshop	27
Section 2	29
2.1 End of Project workshop	29
2.1.1 Terms of Reference	29
2.1.2 Workshop Report	31
2.1.3 Workshop Recommendations	34
2.2 Project Personnel	36
2.3 Conclusion	37
2.4 Recommendations	38
Bibliography	39
Annex 1: Agenda of End of Project Workshop	41
Annex 2: IUCN Speech at End of Project Workshop	43
Annex 3: List of Participants End of Project Workshop	45

List of Tables and Figures

Tables

N°		Page
1	Use of Main Natural Resources by Communities.....	15
2	Summary of Stakeholder Roles in Fire Management.....	17
3	Exemplary Community Fire Plan (August 2007 to March 2008 for Begoro District).....	22
4	Post-Fire Restoration Proposals.....	25

Figures

N°		Page
1	Exemplary display of the results of the magic bean exercise (Winneba District).....	13
2	Men, women, specialists per district on resource use (scores normalised -----)	13
3	Results of stakeholder importance versus influence in fire management.....	18
4	Methodological process for implementing Activities 1.2; 4.1 and 4.2.....	24
5	Ranking of resource importance by Districts.....	24
6	Taungya Scheme sites in the Pamu-Berekum Forest Reserve.....	26

Abbreviations

ADRA	Adventist Relief Agency
CBFiM	Community-Based Fire Management
CBO	Community Based Organisation
CFC	Community Forest Committee
DAs	District Assemblies
GDP	Gross Domestic Product
DVGs	Disaster Volunteer groups
EPA	Environmental Protection Agency
FAO	Food and Agricultural Organisation of the United Nations Organisation
FC	Forestry Commission
FM	Frequency Modulation (Proximity Radio Station)
FORIG	Forestry Research Institute of Ghana
FRNR	Faculty of Renewable Natural Resources (of KNUST)
FSD	Forestry Services Division
FVS	Fire volunteer Squads
GES	Ghana Education Service
GNFS	Ghana National Fire Service
GPRTU	Ghana Private Road Transport Union
GPS	Ghana Police Service
GWS	Ghana Weather Services
HIPIC	Highly Indebted Poor Country
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
KNUST	Kwame Nkrumah University of Science and Technology
MAs	Municipal Assemblies
MLNR	Ministry of Lands and Natural Resources
MOFA	Ministry of Food and Agriculture
MSD	Meteorological Services Department
NADMO	National Disaster management Organisation
NCCE	National Commission on Civic Education
NGO	Non-Governmental Organization
NTFPs	Non-Timber Forest Products
OEF	Okyeaman Education Foundation
RCS	Red Cross Society (Ghana)
RMSC	Resource Management Support Centre
TAs	Traditional Authorities
WFMPZ	Wild Fire Management Project in the Transition Zone of Ghana

Executive Summary

1.1 Project Abstract

Title: Fire-management and post-fire restoration with local community collaboration in Ghana

Executive Agency: IUCN Central and West Africa Program (PACO)
Host Government: Ghana Government
Starting Date: November 2005
Duration: 36 Months
Project Status: Project under Special Extension to December 2010
Project Costs: US\$ 587,718
Implementing Agencies: Forestry Research Institute of Ghana (FORIG) & Resource Management Support Centre (RMSC)

Project objective

Efficient community based wildfire management contributes to restoration and sustainable management of timber and other products in Ghanaian fire prone areas.

Project outputs

The project had five (5) outputs as follows:

- 1. Relationship between use of resources by rural communities & effective fire management determined;*
- 2. Roles and responsibilities of key stakeholders in fire management in Ghana are determined;*
- 3. Mechanisms for effective community based fire management are developed and implemented;*
- 4. Fire degraded areas are rehabilitated by using valuable species as determined by the local communities;*
- 5. Gaps in existing legislation on community based fire management are identified and disseminated.*

Project target districts and communities

Project activities were carried out in the following districts and communities:

Dormaa District:	Asunsu No1, Twumkrom, Abonsrakrom
Mpraeso District:	Nsuta, Gyaekasa, Measo
Juaso District:	Kowerso, Aberewapong, Bebome
Begoro District:	Besetuom, Ahomasu, Kumfrefre
Winneba/ Cape Coast District:	Mankuadze and Komenda

Staffing

The project was implemented through a team of 6 persons i.e. three (3) IUCN staff and three (3) FORIG staff. The project Coordinator was based at FORIG and was half paid by the project. The

other members of the FORIG team (2) were paid monthly allowances. The 3 IUCN team members were paid through Staff Time justifications. The project was supported by international consultancies (expertise in forest ecology and research, expertise in forest rehabilitation and restoration; expertise in forest management – Fires, and expertise in forest wildlife and community livelihood) and national consultancies in socio-economic surveys, training, and legal issues.

Project brief and impact

The 'Fire Management and Post Fire Restoration with Local Community Collaboration Project' started in Ghana in November 2005. The project was funded by the International Tropical Timber Organisation (ITTO) with IUCN as its Executing Agency and FORIG and RMSC as its Ghanaian implementing Agencies. The project sought to increase benefits to local communities from forest products in Ghanaian fire prone areas by promoting mastery of fire management interventions. This was perceived to ensure the protection of timber, non timber forest products (NTFPs) as well as the restoration of fire degraded lands with adapted local tree species. The project built on previous fire projects in Ghana and filled gaps that were not sufficiently addressed. It revealed that with adequate wildfire management, significant gains can be made to the national economy with enormous livelihood benefits for local communities. The project consequently advocated the importance of community involvement in fire management. It enhanced the capacity of local communities in several project areas through training in fire management, provision of fire fighting wares, support in post-fire restoration efforts and more.

It was revealed that wherever people had a direct interest in protecting their natural resources, unplanned wildfires would be reduced. Interactions with local community members revealed that they will mobilize themselves to prevent wildfires when they acknowledge that by so doing, they will benefit in maintaining their natural resources, and consequently their livelihood. The current end of project report covers the period from November 2005 to December 2010. It however also captures contingency interventions undertaken just after December 2010, more specifically the April 2011 end of project workshop in Kumasi. The referred workshop sensitised and enhanced capacity in the use of the adopted Guidelines and Manual for Community-Based Fire Management in Ghana.

The project successfully undertook the following key interventions:

- Socio-economic surveys in the project target areas;
- Fire and livelihood surveys in the project target areas;
- Surveys on local and community laws with an impact on fire;
- Surveys on local and national institutions dealing with fire;
- Research on fire behaviour and production of a community Fire Manual.

Field operations included the successful formation and promotion of community fire volunteer squads in the project areas; establishment of nurseries that have been supplying seedlings for rehabilitation in degraded areas, mainly around the Pamu-Berekum Forest Reserve; development of local benefit sharing Agreements (land tenure convention with government) through a Taungya scheme for tree plantings in the government forest reserve; production of a map of the target planting area following ground-truthing exercises, etc. More than 250,000 seedlings of various

indigenous tree species have been produced by beneficiary communities and are being used for restoration efforts on 400 hectares of land in the Pamu-Berekum Forest Reserve.

The project had 18 months as no cost extension period, authorised to accommodate forest restoration efforts which depended on the weather elements of rainfall and the length of the dry season.

1.2 Presentation of Report

This report is presented in two main sections, namely:

Section 1. Comprising the technical achievements of the project, and

Section 2. Comprising the Contingency period, i.e. end of project workshop implemented in 2011

Section 1

Main Text of Technical Project Achievements

1.1 Output 1: Relationship between utilization of resources by rural communities and effective fire management determined

Although the relationship between resource utilization by rural communities and fire has been studied previously in Ghana, the review of past and present fire management activities in the country makes it evident that a lot of this information is contradictory and is usually not accepted by all stakeholders. For example, estimates of the damage that fire causes to the national economy is often cited, but little verifiable data existed for the loss of revenue and livelihoods of rural communities caused by fire. Output 1 sought information of similar nature to help promote the importance of community involvement in fire management, especially among decision makers. It is expected that this will support recognition and promotion of the role of rural communities in effective fire management policies and strategies.

Activity 1.1 Collection of socioeconomic and environmental baseline data in pilot communities

Introduction

Although fire is considered one of the most important tools available to communities in Ghana, the lack of its efficient control and mastery leads to enormous human, environmental and economic damage and loss each year. The traditional farming practice of slash and burn more than anything else, is responsible for fires in the forest zone of Ghana. Irrespective of the anthropogenic origin of fire it can be avoided to a large extent if local people are well educated on the threats that it poses to their environment and livelihood. Moreover local people will support and partake in adapted fire management approaches if they take account not only of modern scientific processes but also of their traditional ecological knowledge in fire use and management. It was therefore necessary to collate community experiences in wildfire management along-side previous fire management efforts supported by other partners.

The Activity was addressed by six sub-activities, namely: verification and prioritization of project pilot communities; literature and activity review of similar activities that have been or are on-going in Ghana; preparation and peer review of baseline methodology; field test and refinement of methodology; collection of baseline data on the field, and; analysis and report writing.

The rationale for this Activity was three-fold namely:

That 95 percent of wildfires in Ghana are caused by human activities and that efforts to develop mitigation strategies for wildfires revolve around how to address the human causes of fire;

The participation of local people in the planning of fire management has long been identified as necessary for reducing the number and spread of wildfires even as socioeconomic and environmental data on fire occurrence and use is required for policy making;

New partnerships in community-based fire management which promote adapted options to traditional uses of fire need to be identified.

These should lead to better education of users about the costs and benefits of various kinds of fire as a solution and motivation for the prevention and suppression of wild fires.

Methodology

The objective of the Activity was three-fold, namely:

To identify environmental, social and economic information/conditions and trends for wildfire management in partnership with local communities;

To characterize experiences of local communities' loss of revenue/property and livelihood through wild fires; and

To integrate fire management with community production/livelihood systems for sustainable community based fire management.

Twelve local communities from five fire-prone forest districts were assessed and prioritized. A base-line methodology for the collection of socioeconomic and environmental data was produced. The study area included five districts and 12 communities as follows:

Dorma'a District: represented by Asunsu No1, Twumkrom, and Abonsrakrom communities.

Mpraeso District: represented by Measo community.

Begoro District: represented by Besebuom, Ahomahomasu, and Kumfere communities.

Winneba District: represented by Mankuadze, and Onyadze communities.

Juaso District: represented by Kowerso, and Bebome communities.

The methodology consisted of the following processes:

Review of secondary data;

Collection of primary data through:

☞ Intensive household survey following the approaches of (Virtanen, 2000), (Virtanen et al. 2002), (Gouyon A. et al 2002), and (Cardoso de Mendonca et al. 2004);

☞ A semi-structured questionnaire was improved through group discussions/meetings/the use of key informants, and finally fine-tuned;

☞ The questionnaire was administered randomly on 5% of persons engaged in forest or farm bush related activities.

Major findings and trends from interviews

Most community members react swiftly/ promptly to wildfire incidences (65.1%); only a few community members react promptly (33.5%); community members do not participate (0.9%); only CFC members react promptly (0.5%); many more people are now participating as compared to the previous years (53.4%); fewer people are participating (40.9%), and it has been the same over the years (5.8%).

The above responses imply that any training in the prevention and management of wildfires should not only target fire volunteer squads but should engage representatives of the different social classes of communities, and be as broad and inclusive as possible.

Reasons for increased participation in wildfire management:

Because of loss of property and livelihood through this or that wildfire;

Laws are compelling people to participate;

The above responses imply that people need to be convinced through the real effects of wildfires on their lives. Essentially, landscape benefits were greater in the years that communities successfully disrupted and checked all wildfires than in years that the fires were not adequately prevented or controlled.

Baseline information was provided on wildfire impacts and their management in local communities in 5 districts. From this analysis it was revealed that:

- ☞ Communities lose varying amounts of money due to food crop damages by wildfire;
- ☞ Livelihood of community members is affected through a reduction in crop production and loss of livestock;
- ☞ Environmental damages to communities as a result of wildfire were disclosed to be:
Reduction in soil fertility;
Presence of fire adapted grasses in the area, and
Reduction in rainfall amount and changing patterns.

Indicators of periods of high fire risks were described as when trees shed leaves, and the experience of harmattan. Interviewees indicated that fire education programs reach out to communities from different groups of people i.e. not only from fire specialists.

It was revealed that communities prevent wildfire mainly by: making fire belts around their farms and homes; and by using early warning announcements to raise awareness.

Tree branches and cutlasses were the main equipment used for moderate wildfire suppression. For intensive surface or crown fires, communities looked-on helpless. Moreover, there were no definite fire management plans in communities.

Policy implication:

Develop and implement a model of community-based fire management to prevent and manage wildfire on a sustainable basis.

Activity 1.2 Inventory of the key natural resources used by local communities

Introduction

This activity was addressed by five sub-activities, namely: familiarisation with the project pilot communities; preparation and peer review of baseline methodology; field testing and refinement of the methodology; collecting baseline data on the field; and, analysing and producing a report.

The activity was defined as: *Inventory of the key natural resources used by local communities, high-lighting those on which communities depend to prevent, promote or confront fires.*

Key natural resources were defined as “key species” identified to a level against which monitoring procedures in their use and management could be undertaken. Moreover, following the establishment of species trials and demonstrations in the form of a Taungya scheme implied that the performance of such trials was to be monitored objectively, empirically and in a statistically sound manner. Key natural resources used by the local communities’ implied various types of plant and animal species, including general notes on water, soil and climatic resources. Incidentally Activity 1.1 i.e. the socio-economic surveys in the same communities took account of these aspects. In the primary interpretation of the aim of this activity, local use had to be considered important for a species to be “key”. Incidentally, most species have some use even if minor. Also, the Activity examined species that, whilst not necessarily used themselves, to

a great extent, were actually, potentially or particularly valuable to the ecosystem e.g. in fire breaks or because other useful species depended on them.

Methodology

Communities and their landscapes in 4 districts were surveyed. One to three adjacent communities of each district were grouped as a study area. Participatory ecological surveys of the key natural resources in these four study areas had the following components and aims.

(a) Meeting with chief /elders

The aim of this exercise was to obtain information on candidate 'key species', i.e. lists of important resources (or weeds or pests) that were disappearing (or increasing) at least partly due to fires. Two days were spent per study area for assessments of changes up to the current year in the usage and abundance patterns of key resources with a focus on year-on-year changes. After formalities, the field team asked for background information about the community, including history and origins focusing on recent history that had affected vegetation and fire in the neighborhood, i.e. population changes; effects of the 1983 and 1960 fires, forest losses, changes in stream-flow etc.

(b) Group discussions and species assessments from a household perspective

The group discussions were based on a questionnaire that involved 3-8 people in each session. It investigated abundance trends (i.e. the species is disappearing, etc.); usage amount (i.e. we use less and less,); trends in the cost or effort to obtain species (i.e. because it is harder to find these days, etc); possible substitutes (i.e. we prefer species X or Y"); and the capture of immediate and distal reasons (i.e. reasons behind the primary reasons) for the disappearance of dwindling species. Relevant comments, such as local propagation of the species were also noted.

(c) Group discussions and species assessments from a vegetation perspective

These discussions also included assessments of trends over the last few years in resource usage and abundance patterns. It also allowed researchers to discuss the vegetation and other common species with the local community. The aim of the exercise was partly, to obtain information on candidate 'key species'; lists of important resources (or weeds or pests) that were disappearing (or increasing) at least partly due to fire. However, unlike exercise 2, these field visits allowed researchers to assess various types of vegetation in the study area (burnt/ un-burnt etc.) and to develop a local / Latin name dictionary for each area, with annotations about uses and ecology.

A wide variety of vegetation types were selected for study, including: less and more burnt, older and younger, swampy or not swampy types. Visits were repeated to different patches of the most interesting types – i.e. the most species rich types. The visits encouraged discussions about key species from an ecological perspective (most abundant, more common, and beneficial for the ecosystem) in the area; as well as adding to the list of species that were considered as key resources (useful or beneficial or detrimental). Species names were collated and vouchered with repetitions for each vegetation type. Typical questions asked in this case included:

Is it commonly planted, easy to grow?; Is it fire resistant / affected badly by fire?; Is it important for other useful species (i.e. food plants); or does it take over and dominate, reducing other species? And might it be good in firebreaks?

(d) Magic bean exercise

This was a participatory prioritization exercise where representatives of a target community allocated tokens ('magic beans') to species according to their perceived priority for research and development. Conceptually, one magic bean represented one unit of research and development, i.e. the planting or restoration importance of that species. Participants in the exercise were each given ten (10) beans. They piled them on cards with the species name written, according to 'how much they individually would like to promote that species' in the local area. So, if they felt that there was enough of the species already growing or available nearby, they did not allocate beans to the species, however important it was to them. The local names of these potentially key species' were written on card(s), colored and arranged on a floor or table according to commodity group (Fuel, food, construction, medicine, etc.).

All species which were declining, constant, rare, or of increasing 'cost' mentioned repeatedly as useful were included.

Participants took turns to allocate beans to species, no one ideally allocating all their beans before others had started. This was meant to encourage strategic thinking for the community, with men given different colored beans from women even as male and female specialists (i.e. herbalists) were given different colors of beans as well, making a total of four different colors of beans. At the end of the exercise the number of beans by species, card and gender/specialist were summed and recorded in a table (species for rows: and male specialist, female specialist, male non-specialist, female non specialist for columns). If a species was used for two very different objectives (i.e. a tree with fruits for food and wood for fuel), and both uses were of similar importance, then a single species card would be colored or two cards would be made (one for its fruit, an another for its wood) if it was perceived that one use may conflict with the other.



The Magic Bean Exercise

The magic bean exercise allowed communities to express themselves in a more precise way on the relative effort that they thought conservation partners should allocate in promoting key resources. It involved the use of four different colors of beans to prioritize the usefulness of key species.

Such resources i.e. key species were highlighted by the house and field discussions. Similar colors of beans were used by similar groups, i.e. whether males or females and whether male or female specialists. Specialist referred mostly to herbalists.

The exercise also highlighted the different priorities between communities; between men and women; and between specialists i.e. herbalists and other main user groups.

Major findings / Results

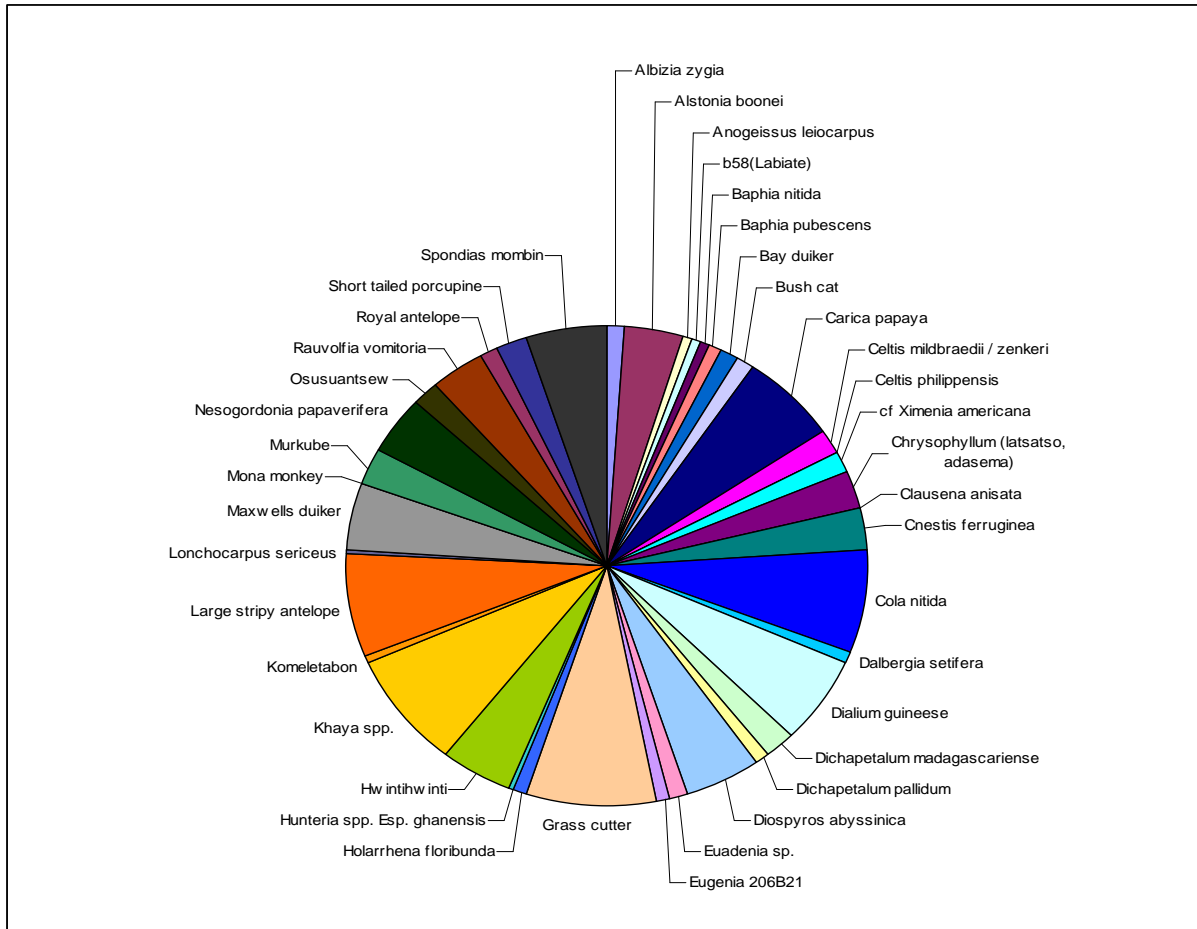


Fig 1: Exemplary display of the results of the magic bean exercise (Winneba District)

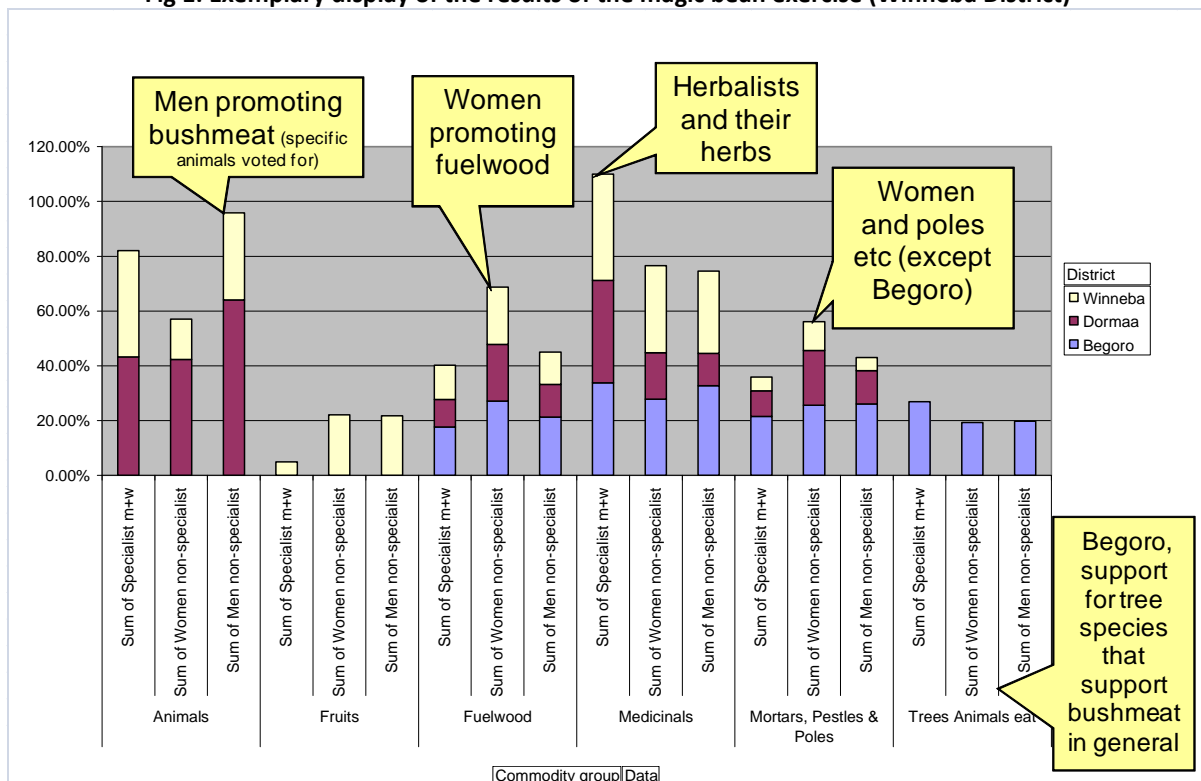


Fig 2: Men, women, specialists per district on resource use (scores normalised to % for district and gender).

Data analyses using the above tools revealed that desired species in the target project sites included wildlife species whose restoration or propagation was perceived to depend on the reforestation of degraded forests. Project districts sometimes manifested remarkable differences in species preferences. For example, the Grass-Cutter or Cane Rat (*Thryonomys swinderianus*) was highly desired for restoration in Juaso and Winneba but not elsewhere. In order to obtain average preferences for species, the records of the different districts (Juaso, Dorma'a, Begoro and Winneba) were weighted i.e. each of the districts had a total of 1,000 votes bringing the total to 4,000 votes. The ten most preferred species for restoration were consequently the following: (a) Cane Rat or Grass-Cutter (b) *Celtis mildbraedi / zenkeri* (c) *Milicia excelsa / regia* (d) snails (e) *Carica papaya* (f) *Khaya spp* (g) *Nesogordonia papaverifera* (h) *Nsuomunam / fish* (i) *Vernonia conferta* and (h) *Chrysophyllum (latsatso, adasema)*.

The following constituted reasons for the choice of the ten most desired species:

Table 1: Use of Main Natural Resources by Communities

Species	Usage
1. Cane Rat / Grass-Cutter	Bush-meat, substitute for fish, substitute for poultry and beef. <u>Observation:</u> Might be better in special farms.
2. <i>Celtis mildbraedi / zenkeri</i>	Fire-wood, charcoal
3. <i>Milicia excelsa / regia</i>	Carving of mortars and pestles, fire wood and charcoal, construction timber. <u>Observation:</u> Regenerates naturally very well.
4. Snails	Bush-meat, substitute for fish, substitute for poultry and beef. <u>Observation:</u> Might be better in special farms.
5. <i>Carica papaya</i>	Edible fruit, piece of unripe fruit eaten to cure severe stomach pain, fresh root given to birthing women helps push down placenta, seeds act as purgative when eaten. <u>Observation:</u> Might be better in special farms.
6. <i>Khaya spp</i>	Carving of mortars and pestles, fire-wood and charcoal, construction timber, medicine. <u>Observation:</u> Several species / varieties should be mixed in restoration plantings.
7. <i>Nesogordonia papaverifera</i>	Carving of mortar and pestles, construction timber, poles, promotes growth of mushrooms, medicine, and fire-wood.

8. Nsuomunam / fish	Fresh water fish, substitute for meat and poultry.
9. <i>Vernonia conferta</i>	Medicine
10. <i>Chrysophyllum</i> (latsatso, adasema)	Fire-wood

1.2 Output 2: Roles and responsibilities of key stakeholders in fire management determined

The absence of coordination between various fire projects and interventions such as among various agencies on the one hand and the rural stakeholders and decentralised governmental agencies on the other hand, is a major deficiency for the sustainable management of wildfires in Ghana. Output 2 addressed this problem by clarifying the roles and responsibilities of the various stakeholders in fire management. The output was achieved through three activities whose approach, method of realisation and results are presented below.

Activity 2.1 Identification of all relevant stakeholders and determination of their roles and responsibilities

Introduction

This activity was addressed by four sub-activities, namely: stakeholder analysis (including those from outside the immediate target communities); in-depth interviews of different stakeholder groups (individuals and focus groups) and verification of responses; analysis of roles and responsibilities of major stakeholder groups with indications on how their behaviour had changed over time; and analysis and write-up of report. A stakeholder was defined as an individual or group who had something to gain or lose by a proposed intervention, in this case fire management. Stakeholder analysis was described as a process by which all users of fire and those impacted fires were identified, and their roles and responsibility determined.

Methodology

The activity was conducted in the form of a study in four forest districts (Begoro, Juaso, Winneba and Dorma'a) with at least two communities per district sampled for the study. Data collection techniques included: desk study of previous fire management projects to identify stakeholders; formal Interviews for state organisations (target respondents were either head of institution or deputy); and focus group discussions with community level institutions. The study involved six main stakeholder organizations, namely: the Ghana National Fire Service (GNFS); the Ministry of Food and Agriculture (MOFA); the Forest Services Division (FSD); District Assembly (DA); the Ghana Police Service (GPS); the National Disaster management Organisation (NADMO); and the National Commission on Civic Education (NCCE) in the Dorma'a district. Respondents included: local level stakeholders; fire volunteers, unit committee members; chiefs and elders; community members, and men and women to ensure that gender differences were captured.

Focus group discussions were undertaken with groups of 10-15 people. Simple pictorial tools were used to assess the relative importance of stakeholders in various aspects of fire management; stakeholders were represented by different colours of flash cards and placed in relative positions to show their comparative importance. The formal interviews captured consensus on same issues.

Findings / Results

The findings were presented in three headings, namely: Fire usage; stakeholder influence on fire and how stakeholders control or support the control of wildfire. Pertaining to the use of fire, MoFA and NADMO were indirectly involved through farmers; the FSD is mandated by law to use fire for management activities; and the GNFS uses fire to demonstrate back-firing in fire suppression. Local communities use fire in burning cut vegetation/debris on farms; in palm wine tapping; and in honey collection. Concerning the influence of fires in local communities, the FSD, MOFA, DA, NCCE, GNFS and NADMO's major role was reported as mainly through education in the effective use of fire. Additionally MOFA and NADMO provide financial support for incentives and education in the Begoro District; in Dorma'a district the DA is the lead institution supported by members of the Anti-bush fire committee in formulating and enforcing bylaws. Concerning stakeholder influence on fire and how they control or support the control of wildfire: FSD, MOFA, GNFS and NADMO are involved in mobilising people for fire suppression through their technical staff; while fire volunteers help in improving mobilisation for fire suppression. A summary of the different roles of fire stakeholders is presented below:

Table 2: Summary of Stakeholder Roles in Fire Management

Stakeholder	Role
Fire Volunteer Squad	Law enforcement, mobilization, fire suppression, fuel break establishment, fire detection, education, communication
Unit committee members and Assembly men	Law enforcement, mobilization, fuel break establishment, Education, Communication
Chief and Opinion leaders	Development of bye-laws, law enforcement, mobilization, education, communication
Farmers	Fire prevention, fire-break establishment, Fire detection, communication, fuel management
Disaster Volunteer groups (DVG)	Sensitization at the community level, report incidents of fire, fire suppression
Male community members	Fire detection, fuel-break establishment, fire detection, communication
Female Community Members	Fire suppression (fetching of water), Fuel-break establishment, fire detection, communication
Church Leaders	Education
Non -formal Education/Teachers	Education
31 st December Women's Movement	Education, provision of resources
Forest Services Division	Fuel-break establishment, fire suppression, education, communication, fuel management, resource
Ghana National Fire Service (GNFS)	Fire suppression, training, education,
Information Service (Local FM)	Education, communication, provision of free airtime
NADMO	Education, mobilization fire suppress, resource provision, provide relief services to victims of wildfires
District Assembly	Finance fire prevention educational programs, provide equipment to local communities for fire suppression
MoFA	Fuel management, support education

NCCE	Education
Adventist Relief Agency (ADRA)	Education, resource provision
Police	Law enforcement, support educational activities
GPRTU	Fire detection and communication
Timber Contractors	Fuel management, fire detection
Environmental Protection Agency	Education
Red Cross Society (RCS)	Education on safety measures and first-aid
Ghana Education Service (GES)	Education
Okyeman Education Foundation (OEF)	Education
Judiciary	Law enforcement
METEO (MSD)	Warning on hazardous weather conditions

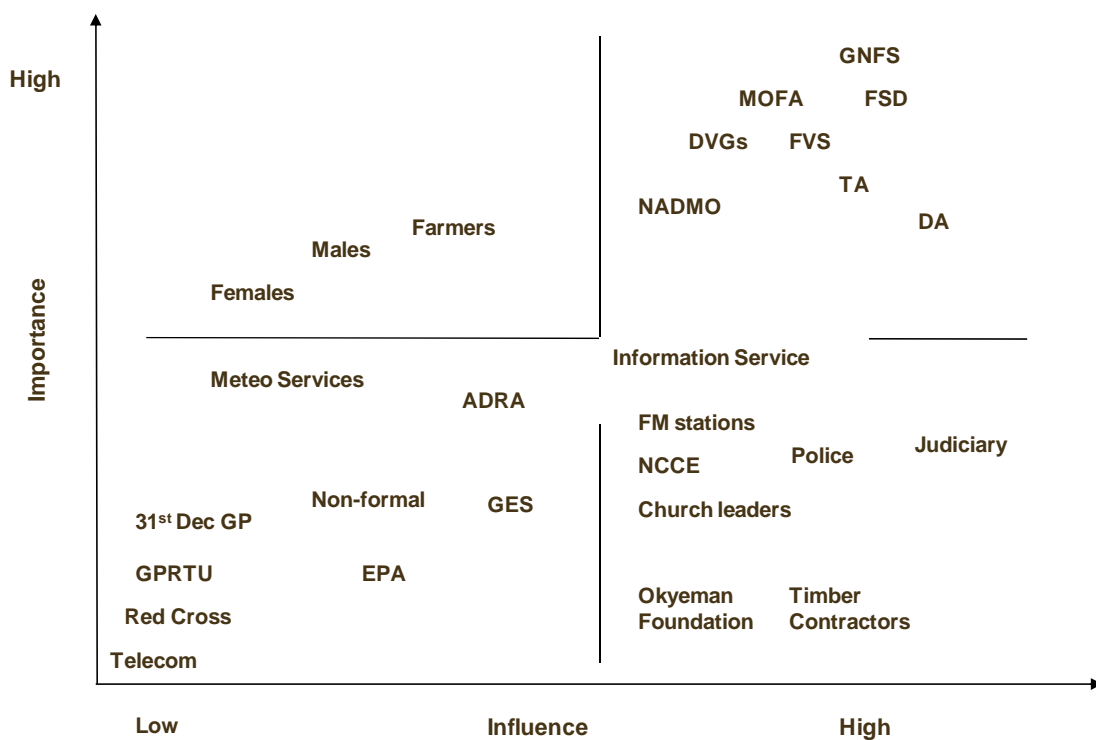


Fig 3: Results of stakeholder importance versus influence in fire management

Conclusion

Although the Ghana National Fire Service (GNFS) and the Forestry Services Division (FSD) of the Forestry Commission are at the apex of importance and influence of fire management in Ghana, different stakeholders are prioritized as important for different aspects of fire management. Neither district level organizational stakeholders nor local level stakeholders can ensure effective fire management in isolation, hence the need for collaboration. The effectiveness of stakeholders

in executing their roles in fire management seemed to vary from one district to another. This might be related to the kind of coordination and commitment of key stakeholders like the District Assembly and the pro-activeness in forming multi-stakeholder committees like the anti-bush fire committee in Dorma'a and the presence of overlapping roles (need to educate stakeholders through workshops to avoid conflicts).

Activity 2.2 Organization of yearly stakeholder workshops, and

Activity 2.3 Training of stakeholders to meet their roles and responsibilities in fire management

Introduction

Activities 2.2 and 2.3 are presented together. This is because both Activities were carried out in the same forums i.e. through seminars that covered a minimum of four (4) days each per target locality.

Activity 2.2 was addressed by seven sub-activities that included: determination of the workshop methodology; preparation of the terms of reference of the workshops; logistical preparations; facilitation of the workshop, and development and writing of the workshop report. Meanwhile Activity 2.3 was addressed by six sub-activities namely: implementation of training needs assessment; designing training programme; selection of participants for the training; organisation of training session logistics, and effective training; and writing of training report.

The objectives of the yearly stakeholder workshops were summarily fourfold, namely: (a) determine the impact of fire on the livelihood of local communities (b) determine the mechanisms for effective community based fire management (c) collection of proposals for improvement of wildfire policy and (d) training of stakeholders to meet their roles and responsibilities in fire management.

Methodology

The workshops were carried out annually in the four districts of Begoro, Juaso, Winneba and Dorma'a. They included representatives of all major local and district level institutions and stakeholders earlier identified during the socioeconomic study. The four days workshops with participations ranging from 80 to 120 persons were facilitated by FORIG and RMSC experts. Participants worked in groups for the first two days at the end of which there was clarity in terms of needs for further training in fire management.

Findings / Results

During the stakeholder workshops, participants were amongst others, sensitized and trained in fire prevention, pre-suppression, and suppression techniques. The following constituted common proposals during the working groups of the annual stakeholders meetings:

All boundaries of common landed properties in the fire zone should be well defined and protected by law and managed by those legally identified to do so;

In the case where communities are requested to participate in the protection of forest reserves, there should be an adequate benefit sharing agreement to encourage communities in their efforts;

Some form of insurance should be provided to fire volunteer squads and those who suffer injuries during fire control operations for adequate compensation;

Children of fire volunteers who are incapacitated during fire fighting operations (including death) should be educated by the government of Ghana;

Communities in fire prone areas which successfully prevent (not suppress) i.e. do not experience any wildfires for a given number of years should be honoured during national public events and manifestations such as the National Farmers' Day;

The FSD should provide resilient / fire tolerant species for planting by communities in burnt areas.

1.3 Output 3: Mechanisms for effective community based fire management developed and implemented

Sensitisation on wildfires as well as supporting tools, and byelaws had been indicated to be insufficient especially at the rural level for effective fire management. This output addressed such gaps firstly, by building awareness on the existing policies and laws and secondly, by facilitating the creation of the missing elements, such as the manual of procedures for community based fire management.

Activity 3.1: Inform rural communities about existing fire policies and laws

Activity 3.3: Facilitate the implementation of community based fire management

Activity 3.4: Create awareness on radio, local bulletins, and through other means

Introduction

Activities 3.1, 3.3 and 3.4 are presented together as they were almost always implemented together, usually through large district stakeholder workshops for Activities 3.1 and 3.3. Such annual stakeholder workshops were also used to create awareness on fire related issues and management proposed under Activity 3.4. More specifically, Activity 3.1 was addressed by four (4) sub-activities, namely: preparation and development of wildfire posters and bulletins; identification and contracting of appropriate radio stations; placement of posters, distribution of bulletins and engagement in radio broadcasts, and; production of reports. Activity 3.3 was also addressed by four (4) sub-activities, namely: development of community-based fire management system; discussion of management system with communities; review of developed system, and; implementation of the system by communities. Activity 3.4 was also addressed by four sub-activities, namely: investigation of production costs of radio announcements / bulletin production; development of radio messages / bulletin write-up information; test of impact of messages / draft

bulletin, and review; and engagement of radio stations, and development and publication of bulletins.

Methodology

The process for poster and bulletin development involved the identification of individuals in collaborative institutions to undertake illustrations and sketches for posters, and photographic images for bulletins and hand-outs. The process for radio broadcasts involved the identification of individuals in collaborative radio stations with whom the appropriate radio messages were designed and then broadcast. The process for informing communities about existing statutory policies and bye-laws on fire, involved the collation of such laws and policies and presenting them to stakeholders in the local dialects during the stakeholder workshops reported under Activity 2.2. The process adopted for the facilitation of the implementation of community based fire management involved amongst others, the participatory development of community fire plans during the stakeholder workshops reported in Activity 2.2.

Results / Outputs

Several signs, posters and panel boards were designed and placed / erected in strategic positions around target project districts. An example of a panel-board developed by the project and erected along the road in a target community is presented below.

Each annual stakeholder workshop ended with the participatory development of an annual community-based fire management plan. The objective of the plan was to facilitate implementation of community fire management. The plan consisted of a three column matrix that captured strategies, the responsible organisation expected to facilitate implementation of the strategy, and the periods of interventions. An example of the August 2007 to March 2008 community fire plan for Begoro district is presented below:



Above: Fire Sensitisation Panel within the Dorma'a District, Ghana [Photo: Martin N. (IUCN)]

Table 3: Exemplary Community Fire Plan (August 2007 to March 2008 for the Begoro District)

Strategy	Responsible Organisation	Period
Reorganisation and strengthening of committees and volunteer squads	DA, FORIG	August – October
Education / awareness creation on fire (radio announcements, printing posters ...)	DA, GNFS, NCCE, FC, TA, MOFA, FORIG	October (2007) – March (2008)
Provision of protective clothing and equipment to volunteer squads	FORIG [(PD 284/04 Rev. 2 (F))]	October (2007)
Refresher training of volunteers on fire suppression	GNFS, FORIG, DA, LC	October (2007)
Monitoring and patrolling by volunteer squads	DA, FORIG, LC, NADMO	October (2007) – March (2008)
Incentive to best community in fire prevention	FORIG, DA [(PD 284/04 Rev. 2 (F))]	March (2008)
Revisit fire byelaws and implementation of bye-laws	DA, FORIG	From August 2007
Construction of new fire lines / and maintenance of green fire breaks	DA, FORIG, LC	August – October (2007)
Training and erection of early warning systems	DA,LC,FORIG	October (2007) – February (2008)

Activity 3.2: Develop a manual of procedures for community based fire management

Introduction

This activity was addressed by four sub-activities, namely: collation and organisation of materials for the community fire guidelines and manual; write-up / development of the draft guidelines and manual document; review of the draft document through various workshops with fire experts; validation of the guidelines and manual document by the Minister of Lands and Natural Resources of Ghana followed by its publication and distribution.

Methodology

Development of the community fire guidelines and manual for Ghana involved several workshops at local community level as well as the regional and national levels. More specifically the process involved (a) collation of information during meetings with local communities at the target districts, (b) development of the orientation and draft content of the community fire guidelines and manual document during a multi-stakeholder manual workshop in Kumasi, (c) exchanges on the draft document during a first peer review meeting of fire experts in Kumasi, (d) presentation of the draft document during a steering committee meeting of the ITTO/IUCN/FORIG/RMSC project in Kumasi, (e) exchanges and improvement on the contents of the second draft during a second peer review meeting of national fire experts in Kumasi ,(f) development of the final version and submission for the endorsement of the Minister of Lands and Natural Resources of Ghana, and (g) presentation of the endorsed version of the document during a national multi-stakeholder community fire forum in Kumasi, Ghana.

Findings / Results

The community fire guidelines and manual document for Ghana was effectively endorsed by the Minister of Lands and Natural Resources of Ghana in January 2011. The document has since been published and is still being distributed to stakeholders.

1.4 Output 4: Fire degraded areas rehabilitated by using valuable species as determined by local communities

This output arose from a gap that was observed during the project formulation phase of PD 284/04 Rev. 2 (F). Although other projects had previously worked on the fire problem in Ghana, the restoration of fire degraded lands was almost always completely neglected. The community approach advocated by this project meant that post fire restoration was going to be implemented in close collaboration with local communities in a way that would contribute towards some level of rural wealth creation.

Activity 4.1: Identification of (candidate) appropriate species for rehabilitation by local communities

Activity 4.2: Development of tools and practices from existing, and if necessary, new research into fire ecology

Introduction

Activity 4.1 and 4.2 are presented together as they were essentially implemented simultaneously. Activity 4.1 was addressed by five sub-activities, namely: ecological survey of species in the project sites; participatory assessment of the merits of candidate species; literature review of knowledge on regeneration practices for the identified species; incentives and infrastructure for making rehabilitation happen; report preparation and write-up. Activity 4.2 meanwhile was addressed by following three sub-activities, namely: review of literature and existing practices in fire ecology; develop plans for new research trials and plots, and; develop information for annual project report. Eleven communities in the five districts of Wenneba, Dorma'a, Begoro, Mpraeso and Juaso were engaged in these activities. The word "appropriate" in Activity 4.1 was described as sensitivity to the local social and biological environment.

Methodology

Activities 4.1 and 4.2 employed the results of previous studies of the project i.e. the socioeconomic survey captured under Activity 1.1, and the inventory of natural resources used by local communities in the project sites captured by Activity 1.2. More specifically, Activity 1.2 led to an exhaustive data-base of species that was combined in a four-part methodological process summarised by the following illustration. The graphic cones illustration further below is a comparative presentation of the desire by target districts over different groups of species. Animals (Grass Cutter) was rated overall highest followed by medicinals.

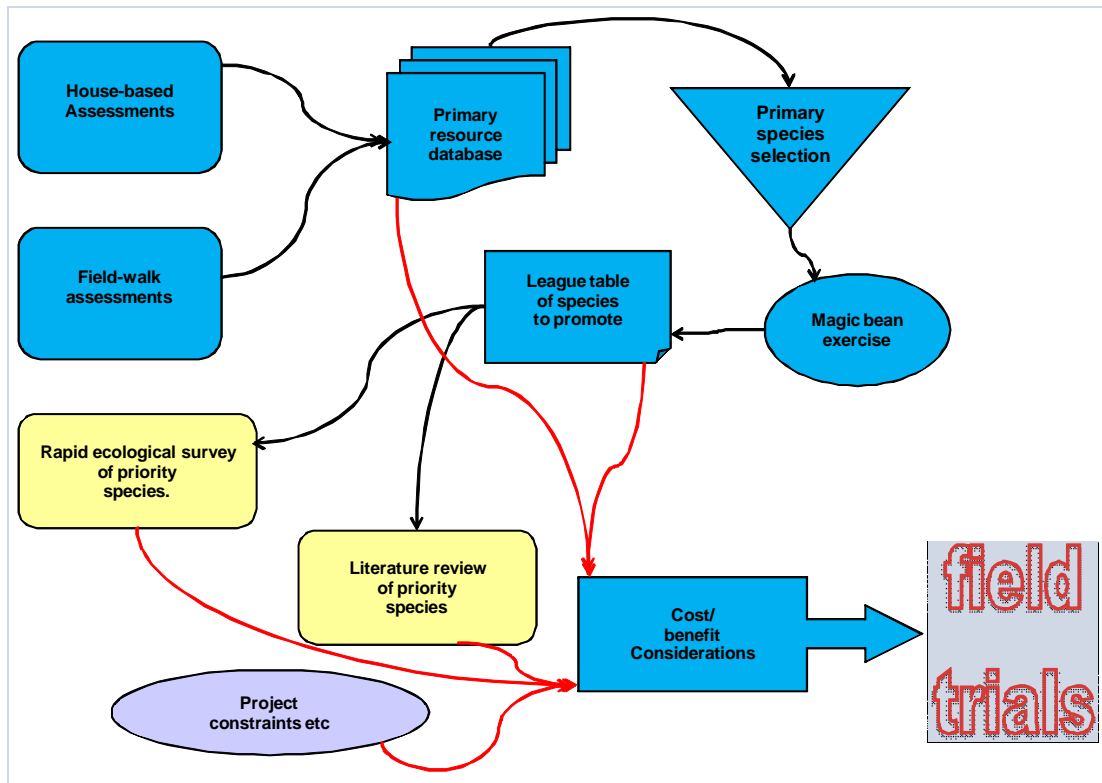


Fig 4: Methodological process for implementing Activities 1.2; 4.1 and 4.2

Results

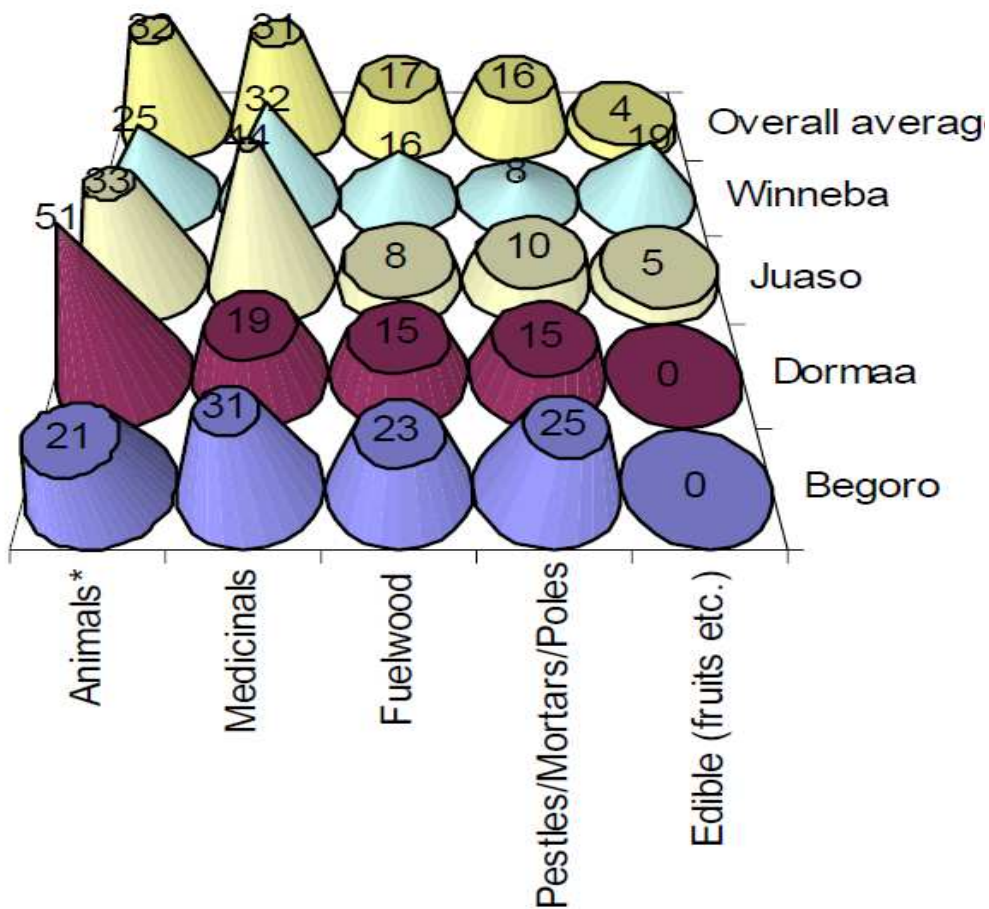


Fig 5: Ranking of resource importance by Districts

The results of Activities 4.1 and 4.2 revealed that animals were mostly desired for restoration in the target communities of the project. It was understood however that this would be accomplished by promoting the planting of environmentally friendly / evergreen tree species such as figs. Scientific assessment taking into account community preferences and other factors led to the following recommendations:

Table 4: Post-Fire Restoration Proposals

Target Species	Proposals on how to proceed
<i>Alstonia</i> , <i>Afzelia africana</i> , <i>Celtis mimdbreadi</i>	These species can be promoted through enrichment planting in fire protected areas. The process could involve broadcasting seeds randomly on prepared soils.
<i>Zanthoxylum</i> , <i>Paullinia</i> , <i>Cnestis</i>	These species can survive if fires are kept out. They are however not in great demand and natural regeneration should allow enough growths in fire protected areas.
<i>Lantana</i> , <i>Lippia</i> , <i>Ocimum</i> , <i>Momordica</i> , savanna grasses	These species will probably decline rapidly in fire protected areas. It is suggested that they should be planted in home gardens, including savanna grasses and shrubs which are flammable and may conflict with fire protection.
<i>Anogeissus</i> , <i>Vitellaria</i>	These are important savanna trees which might have a role as part of the barrier around protected areas or act as the first wave to colonise degraded areas. They should therefore be promoted as such.
<i>Talbotiella gentii</i>	The species witnessed very little local demand but by scientific assessment, it should be promoted. The fire protection effect of the species means that it will be very useful especially in cases where few species in target localities have similar qualities.
<i>Ficus</i>	The evergreen Fig tree attracts avifauna including bats, rodents and snails. Its profuse flowering also attracts bees thereby encouraging bee-keeping. It can be promoted with or without preliminary restoration with <i>Anogeissus</i> or <i>Vitellaria</i> . It should also serve as a fire break species.

Restoration strategy

The overall favoured strategy is to tackle blocks of degraded vegetation and attempt to restore them through (a) concerted fire protection and (b) a reasonable design that places the most vulnerable species within a matrix of more fire resistant species. Natural regeneration should be allowed to run its course while enriching blocks with favoured species.

Various options for community planted “blocks” were analysed. They included amongst others: (a) fire breaks (b) restoration of fetish groves (c) restoration of river-banks, and (d) restoration of relic forests. It should also be possible to influence on-going Taungya endeavours within forest reserves using the preceding “block” approach. The useful side-effect of such a strategy is that it will cause communities and forest authorities to work more closely together using more community friendly policies, and planting more indigenous trees, shrubs, herbs and climbers. Favoured animals (wildlife) can be expected to be restored in such blocks as the blocks develop. However issues that

may arise as a result of mixing roosting trees and food (fruit) producing trees, needs further local research with zoologists. It should be indicated that ten tree species constituting a mix of locals and exotics are habitually promoted for the establishment of green fire-belts in the project landscapes, namely: *Albezia lebbeck*, *Alstonia boonei*, *Azadirachta indica*, *Bilghia sapida*, *Cassia siamea*, *Cordia millenii*, *Ficus spp*, *Funtumia elastica*, *Khaya senegalensis*, and *Milletia thonningii*. To promote post-fire restoration, the project obtained authorisation and developed a map of areas for a community Taungya scheme in the Pamu-Berekum Reserve. The map is displayed below:

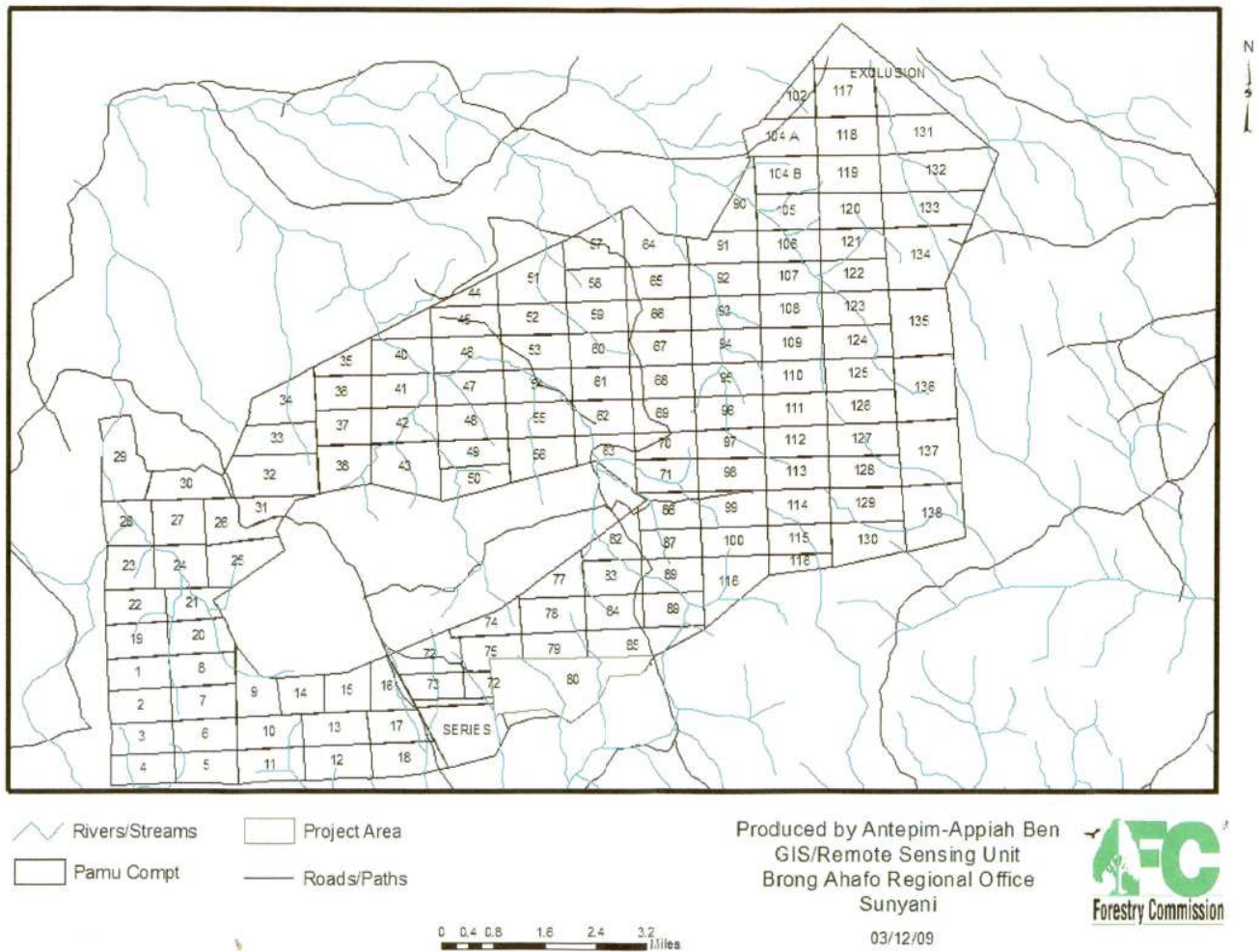


Fig 6: Taungya Scheme sites in the Pamu-Berekum Forest Reserve: [Produced by PD 284/04 Rev. 2 (F)]

The Project also supported an extensive nursery which has been successful in raising the seedlings currently being planted in the Taungya scheme within the Pamu-Berekum Forest Reserve. However, close observation is required with the obligation to record all information likely to inform forest landscape restoration in general and post-fire restoration policy in particular. Also, in order to promote the most adapted options, seedlings from the nursery should not only be limited to the Taungya scheme in the Forest Reserve. Some of the seedlings should be allocated to local plantings in individual farms. It will be useful to monitor the approaches that will be the most fruitful and successful in the long run in terms of (a) species survival (b) growth, and (c) the enhancement of natural regeneration and animal life.

1.5 Output 5: Gaps in existing legislation, on community based fire management identified and disseminated

Although a detailed analysis of the institutional framework for fire management was beyond the scope of this project, Output 5 sought to clarify the legal and institutional gaps related to community involvement in fire management. Of most concern was the particular issue of land-use and land ownership. The output also targeted the promotion of legislation reforms in fire related policies at local and national levels.

Activity 5.1: Review of legislation on community based fire management, including land-use

Activity 5.2: Validation of legislative gaps during a workshop

Introduction

Activities 5.1 and 5.2 are presented together as some of their sub-activities were implemented in the same forums, i.e. during annual stakeholder forums. More specifically, Activity 5.1 was addressed by four main sub-activities, namely: collation of national, district, and community laws and bylaws enabling or impeding community fire management; selection and detailed review of best or worse cases at community and district levels; review of national level legislation and policies; and write up of report. Activity 5.2 meanwhile was addressed by seven sub-activities, namely: determining of workshop methodology; preparation of workshop logistics and organisation of workshop; and facilitation of workshop and; write-up of report.

Methodology

A variety of methods were employed to address Activities 5.1 and 5.2. These included individual collation of fire related legislations and bylaws, group work during stakeholder workshops, presentations during peer review meetings and discussions for observations and remarks during the project steering committee meetings. The stakeholder workshops generated most of the information on bye-laws, while individual and peer review efforts generated information on national legislation and related gaps.

Results

Assessments of the evolution and gaps of fire related laws in Ghana revealed that the government has improved the environment for participatory wildfire management in the country. The Control and Prevention of Bushfires Act of 1990 (P.N.D.C.L. 229) was the foremost among fire related legislations to provide orientation in the management of wildfires in the country. Article 7 of the Act, advocates the creation of fire volunteer squads in every town, area or unit of Ghana, implying community participation in wildfire management. However, the Act did not empower traditional authorities to play a major role in its enforcement. The Ghana Forest and Wildlife Policy of 1994 meanwhile set the stage for forest and wildlife management but did not consider fire as a major problem in forest and wildlife management, thereby relegating wildfire management to a lower position on the national agenda. Also, the Ghana National Fire Service Act (Act 537) of 1997 that established the Ghana National Fire Service, sought amongst others, to provide training in the prevention and suppression of dangerous fires. However, its attachment to the Ministry of the Interior rendered it skewed towards industrial and domestic fire management. Based on lessons

from the weaknesses of past wildfire policies, the government of Ghana adopted the National Wildfire Management Policy of 2006, placed under the coordination of the Ministry of Lands and Natural Resources of Ghana. The policy advocates amongst others, multi-sectorialism and best-practice approaches in wild-fire management. The recently adopted Guidelines and Manual for Community-Based Fire Management (CBFiM) produced by the ITTO/IUCN/FORIG/RMSC project PD 284 / 04 Rev. 2 (F) is framed within this National Wildfire Policy of Ghana. The implementation of the CBFiM will constitute a first full test of the policy.

The following were also considered amongst others, as weaknesses to be taken up by bye-laws or enforced through statutory legislation:

Traditional Authorities and District Assemblies should be empowered (through specially designed training) to formulate and enforce bye-laws for wildfire prevention and control;

Formulated bye-laws should be gazetted within 90 days following their submission. The follow-up of this provision should be the responsibility of District Assemblies;

Burning should be banned from 15th December to 15th April. Meteorological services (MSD) should assume the responsibility to advise as appropriate;

FM Radio stations should allot slots for sensitization on fire danger;

Fire education should be included in the curriculum of schools (basic schools, and professional agricultural and forestry schools);

Some form of compensation should be adopted for fire volunteer squads.

Section 2

2.1 End of Project workshop

Workshop to Facilitate the Use of Community Fire Guidelines and Manual for Ghana
[7th – 8th April 2011, Kumasi – Ghana]

2.1.1 Terms of Reference

Background and Context

Although fire is considered one of the most important tools available to mankind, the lack of its efficient control and mastery leads to enormous human, environmental and economic damage each year. In the drier parts of Ghana, fires are occasionally set by squatters and graziers with the hope of better pastures for livestock, while traditional rainmakers initiate them with the hope of precipitating rainfall. On the contrary, the traditional farming practice of slash and burn is more the cause of fires in the humid forest parts of the country. The problem caused by fire to forests and woodlands is that it reduces the sponge-like function of the vegetation. As fires pass over the vegetation, the surface of the sponge is ironed-out leading to the loss of topsoil from rainfall and winds. The consequence is that floods are facilitated in the rainy season and empty riverbeds are the result in the dry season seriously affecting natural resource dependent communities. In Ghana, fire remains a useful cultural tool as it facilitates hunting, the collection of honey, the processing of palm wine and in ceremonial celebrations. Notwithstanding this benefit, Ghana losses 3% of its GDP from forests annually due to wild-fires.

With the support of the International Tropical Timber Organisation (ITTO), IUCN engaged its members in Ghana, more specifically the Forestry Commission, through its Resource Management Support Centre (RMSC), and the Forestry Research Institute of Ghana (FORIG) within the framework of the “Fire management and post-fire restoration with local community collaboration project”. The project meanwhile engaged local communities seeking to increase benefits accruing to them from forest products in the country’s fire-prone areas by promoting their mastery of fire management and consequently a reduction of the negative impact of fires on their livelihood. More specifically the project’s goal was to ensure the protection of timber, non timber forest products and other resources, as well as restore fire degraded lands with adapted local tree species. During implementation, the project supported several seminars, workshops, studies, consultancies and contacts with services of the Ministry of Lands and Natural Resources of Ghana at the central and decentralized levels of administration, as well as relevant units of the National Fire Service and others, for a period of four years. The studies and contacts led to the development of guidelines and procedures for community based fire management in Ghana, which will be promoted in this proposed workshop cum forum.

Objective

The principal objective of the workshop is to inform main stakeholders of the availability and contents of the Guidelines and Manual for community involvement in the management of wildfires in Ghana. The workshop will consequently dwell on how to use the Community Guidelines and Manual (a main output of the ITTO/IUCN/FORIG/RMSC project). This is in

conformity with section 2.2 of the Ghana National Wildfire Management Policy of 2006 which identifies amongst others, constraints in wildfire management as due to: “Failure to involve traditional structures and systems in fire management resulting in resistance to change due to tightly held beliefs, attitudes, values and practices’ and, ‘lack of support for local communities to participate in wildfire prevention and control programmes’”. Moreover section 3.4.1 of the Fire Policy i.e. Effective prevention and control of wildfires, specifies amongst others to: “Enhance the participation of communities and environmental groups in the planning, implementation, monitoring and evaluation of wildfire prevention and control activity”. This proposed workshop will contribute in the fulfilment of the preceding policy specifications.

Methodology

To facilitate engagement and participation, the workshop will benefit from the shared experiences of typical successes in fire management especially in cases where networks have been useful in monitoring, sharing information and successfully managing wildfires. The two main sections i.e. the Guidelines and Manual of the procedures for community based fire management in Ghana will be explained. This will require the expertise of experienced facilitators in judicial as well as in fire management aspects. The workshop will operate mainly through full plenary sessions interspersed with round-table discussions. The round-table sessions will be facilitated by identified chairpersons. Each identified presenter at the plenary sessions will be allotted a maximum of 30 minutes or as indicated on the workshop program.

Proposed dates & venue of the meeting

Thursday 7th and Friday 8th April 2011 at the Miklin Hotel, Kumasi, Ghana

Participation

Approximately, 60 participants made of government and Para-state officials, traditional authorities, civil society organisations, representatives of community fire management groups, forestry related universities, and international organisations.

Outputs

The workshop will essentially be a capacity building forum and will generate the following outputs:

Printed versions of the community fire guidelines and manual for Ghana will be shared;
Other IUCN and ITTO Fire related documentation will be shared during the workshop;
A workshop declaration and communiqué will be produced;
A workshop report will be written.

END

2.1.2 Workshop Report

Facilitation Forum for the utilization of Community Fire Guidelines and Manual for Ghana

Introduction

With the support of the International Tropical Timber Organization (ITTO), the Forum for the utilization of Community Fire Guidelines and Manual for Ghana, took place at the Miklin hotel in Kumasi, Ghana on 7th and 8th April 2011. The technical organization was made by the International Union for Conservation of Nature (IUCN), Forestry Research Institute of Ghana (FORIG) and the Resource Management Support Center (RMSC).

Approximately, 60 participants made of government and Para-state officials, traditional authorities, civil society organizations, representatives of community fire management groups, forestry related universities, and international organizations took part in the workshop.

The principal objective of the workshop was to inform main stakeholders of the availability and contents of the Guidelines and Manual for community involvement in the management of wildfires in Ghana. The workshop was a capacity building forum during which the printed version of the community fire guidelines and manual for Ghana and other IUCN and ITTO fire related documentation were shared.

The work took place over two days and was designed around an opening ceremony, presentations and interactions.

I- Opening Ceremony

The opening ceremony was chaired by the representative of the Director of FORIG, Dr. Dominic Blay. It was punctuated by three interventions:

- 1- The welcome address by the Representative of the Director of FORIG, Dr. Dominic Blay;
- 2- The address by the Representative of IUCN Regional Director, Dr. Martin Nganje;
- 3- The Opening Address by the Representative of the Minister of Lands & Natural Resources for Ghana, Mr. Musa Abu-Juam.

In his address, Dr. Blay gave a welcome speech on behalf of the Director of FORIG and made a brief presentation of the institution. He then presented an overview of the project, titled: *"Fire management and post fire restoration with the local community collaboration in Ghana"*. He briefly recalled the work done in collaboration with communities that finally resulted in the production of the Guidelines and Manual on fire management. Dr. Blay said he hopes that communities will appropriate the document.

Dr. Nganje first extended greetings to participants from Pr. Aimé Nianogo, the Regional Director for the West and Central Africa program of the IUCN. He also transmitted particular regards to the Government of Ghana through the Ministry of Lands and Natural Resources, and other partners including the Forestry Research Institute of Ghana, and the Resource Management Support Centre of the Forestry Commission of Ghana, for their fruitful collaboration over the years that has made this community fire capacity forum possible. He stated that fire is one of the most important tools available to mankind but the lack of its efficient control and mastery is leading to enormous human, environmental and economic damage each year. Dr Nganje finally said it is IUCN's hope and expectation that the Guidelines and Manual will be useful

and handy to all social groups involved in one way or the other in wildfire management in Ghana and beyond.

Mr. Musa Abu-Juam explained the ministry's approach in tackling fire degraded areas and the effects of wild-fires in the country. He consequently applauded the Fire Guidelines and Manual as a laudable document with which the government was fully aligned. He thanked the ITTO, IUCN, FORIG, RMSC, FC and other stakeholders who collaborated in diverse ways to ensure the success of the project. Mr. Abu-Juam said unlike highly visible fires, the apparently unseen but repeated fires in Ghana in the last decade have caused a similar impact like large fires, leading to the deforestation of about 30% of the country's gazetted forests with huge negative economic and social consequences. He expressed hopes that the Fire Guidelines and Manual will contribute significantly towards communities' interventions against wildfires in the country. He further stressed that the Guidelines and Manual will also act as an encouragement for all natural resource management professionals and educators as well as policy makers at different levels to actively and effectively campaign against wildfires. He finally indicated that the various stakeholders present at the workshop should ensure that the Fire Guidelines and Manual is translated into local languages and possibly into a pictorial format.

II- Presentations and Interactions

In order to facilitate the understanding of participants, presentations in English were translated into Twi (local language) and as far as possible, presented directly in Twi.

The following summarized papers were presented:

1- Wildfire management Policy by Mr. Alex Asare, RMSC-Kumasi;

In his presentation, Mr. Asare referred to past policies and initiatives, the policy framework, and implementation arrangements. He elaborated the effects of wildfires which had adversely resulted in global warming and its subsequent effects. He also shared past experiences in Ghana in 1983 during which fire swept through the entire country especially in the forest areas and the effects such as the loss of human life, wildlife species, shortage in food supply etc. He indicated that previous policies had failed to address wildfires outside Forest Reserves; as a result, the government passed the 2006 Wildfire Policy to create the right environment for the participatory and sustainable management of wildfires.

2- Community Fire project and outputs by Dr. Dominic Blay, FORIG;

In his presentation, Dr. Blay elaborated on the community fire management project's development and specific objectives, its various outputs, activities and sub-activities that were undertaken to ensure its successful completion. He gave the project's outputs achievement and thanked the donor agency ITTO, IUCN, FC, RMSC, Local Community and the various stakeholders that contributed to the success of the project.

3- Interpretation of Guidelines by Dr. E. Marfo, FORIG;

In his presentation, Dr Marfo interpreted the Guidelines and Manual document for Community based Wildfire Management in Ghana. He stated that in addition to the National Wildfire Policy of Ghana, the document was also based on the FAO's 11 (eleven) fire principles born out of the synthesis of global experiences in wild-fire management. He interpreted all the principles, grouped into 5 broad areas, as follows:

Social and cultural (Principles 1-3)
Economic (Principles 4 and 5)

Environmental (Principles 6 and 7)
Institutional (Principles 8 and 9) and
Enhanced fire management capacity (Principles 10 and 11)

Dr. Marfo also shared a checklist of principles to guide national actions towards wildfire management as well as the next line of action. This was presented as follows:

- a. Examine whether identified strategies are adequate to fully internalize the principles.
- b. Examine whether the designated strategies and actions are appropriate under the respective principles and strategies respectively.
- c. Examine whether there is some level of national consensus on the above in addition to language and meaning of terminologies.

4- Discussions

This session was made of questions for clarification. Several questions and clarifications' were provided, amongst which the following:

Question: Education in wildfire management should be sustained by projects such as the community fire project and District Assembly (DA) in various communities.

Response: While the District Assembly and the Government in general, should allocate some funds every year to sensitize forest fringe communities about fire prevention and control, communities should not wait for projects (Fire-management and Post-fire Restoration with Local Community Collaboration in Ghana) or other funds before preventing against wildfires. They should rather work together to address the situation by always considering the potential negative impacts of wildfires on their livelihoods.

Question: In the past, there used to be boundary demarcation of the Forest Reserves but this is no longer done leading to difficulties in determining responsibilities in fire control.

Response: The boundaries of most Forest Reserves have effectively been colonized by elephant grass. This is also because the manpower /numerical strength of FSD staff is small and insufficient to undertake the task. Everyone should be involved in stopping wildfires irrespective of their source or direction.

Question: Only a few communities in the country were targeted for fire-fighting support by the project. This gives the impression that other communities are not or less necessary in fire fighting operations. Moreover it makes fire-fighting by the targeted communities difficult as they sometimes do not receive support from untargeted communities.

Response: A few communities were chosen because of the pilot nature of the project. The capacity building promoted by the project is supposed to be spread and emulated by other communities, nation-wide. Moreover District Assemblies and other stakeholders should be able to provide education and build the capacity of local communities in need of fire-fighting capacity.

4- Wildfire Experiences:

- 4.1 Traditional authorities by Nana O. Twum
- 4.2 Community fire brigades by Mr. B. Kumj;
- 4.3 Women by Mrs. Yaa Lydia;
- 4.4 Fire research by Dr. K. Afriyie, FORIG;
- 4.5 RMSC (Policy and planning) by Mrs. Mercy.

5- Technical Presentations

- 5.1 International experiences of IUCN by Dr. Martin Nganje, IUCN;
- 5.2 Wildfire prevention by Mr. R. Ninonni, RMSC;
- 5.3 Wildfire behavior by Mrs. L. Amissah, FORIG;
- 5.4 Wildfire Pre-suppression by Dr. K. Owusu-Afriyie, FORIG;
- 5.5 Wildfire suppression by Dr. Rex Barnes, Lecturer, FRNR, KNUST;
- 5.6 Developing a community fire management network by Dr. Martin Nganje, IUCN;
- 5.7 How and where to obtain help and support for fire management, by Dr. Atse Yapi, FAO;

Following the various presentations, discussions enabled participants to improve their knowledge on various issues discussed. The various interactions signaled the need to:

- Translate the document into local languages to facilitate communities' ownership and thus make it more convenient.
- Put a network in place and to work in synergy in order to combat wildfires in communities.

2.1.3 Workshop Recommendations

At the end of the workshop, participants made the following recommendations:

To the Government of Ghana (Ministry of Lands and Natural Resources)

A "National Fire Authority" should be established to facilitate the coordination of fire management in Ghana. Current fire management is dispersed between the Ministry of Lands and Natural Resources, District and Municipal Assemblies, the National Fire Service and others. The role of the National Fire Authority could include amongst others; the definition and updating of fire mandates to designated agencies and local groups, as well as the allocation of resources for fire management. The Authority will ensure synergy and coherence of wildfire management interventions in the country.

Equipment and tools needed for fire prevention and control should be made available to communities' where wildfires constitute a problem, to ensure sustainability in wildfire management. Such equipment should include reflective uniforms.

Insurance schemes should be provided to the volunteers as incentives like disability/death.

The Government should provide some form of incentive or livelihood support to fire volunteers to serve as a motivation.

To Development Partners and Civil Society Organizations

Development partners should support the training of fire volunteers in the manipulation of First Aid kits and related processes. Volunteers should then be provided with First Aid Kits for use in case of any injury that members may incur in the course of combating wildfires.

Development partners should support communities to take ownership of responsibilities in wildfire management. This should be targeted through behavior changing campaigns.

Development partners should support the simplification of the Fire Guidelines and Manual document into a more pictorial format thereby making it to be self-explanatory to communities, as well as ensure its translation into the local languages and dialects.

To District and Municipal Assemblies

District / Municipal Assemblies should adopt an approach of keeping an inventory of all firefighting equipment within their areas of jurisdictions.

District / Municipal Assemblies should make it mandatory to provide some support from their common funds for the education of fire volunteers.

To the Ghana National Fire Service (GNFS)

The Ghana National Fire Service should spearhead seasonal fire fighting procedures to make firefighting a sustainable process.

An Incidence Command System should be adopted (plan ahead of each system before it emerges).

To all Fire Stakeholders

Promote the creation of fire networks at the levels of District and Municipal Assemblies.

The implementation arrangements for the Community Fire Guidelines and Manual document should be facilitated by:

The Forestry commission
The Research institutions
Universities
Civil society
District / Municipal Assemblies
Ghana National Fire Service, and
Development partners.

Participants thanked the Government of Ghana through its Ministry of Lands and Natural Resources as well as technical and financial partners for their support that led to the development of the Community Fire Guidelines and Manual for Ghana.

Kumasi, April 8th, 2011

Participants

2.2 Project Personnel

Project technical staff: *Project Leader: Martin NGANJE, PhD.*
National Project Coordinator: Dominic BLAY, PhD.

FORIG Staff:

Dr. Victor Agyeman (Director of FORIG) – Contracting personality
Dr. Dominic Blay (Forest ecologist) – Technical leadership of project
Dr. Owusu Afriyie (Fire ecologist)
Mr. Lawrence Damnyag (Socio-economist)
Mrs. Lucy Ammissah (Fire Expert)
Mr. Francis Dwomoh (Ecologist)

RMSC Staff:

Dr. Oheneba Agyeman (Director of RMSC) – Contracting personality
Mr. Alex Asare (Manager Collaborative Forest Management) – Technical representative
Messrs. Edward Obiyaw/Richard Ninnoni (Manager in charge of Biodiversity Conservation)

IUCN Staff:

Mr. Stewart Maginnis (IUCN Head of the Forest Conservation Programme)
Mr. Jean-Marc Garreau (Programme Coordinator IUCN PACO) – Tech Supp
Dr. Martin Nganje (IUCN Senior Forestry Officer for Central & West Africa)
Mr. Samuel Kofi Nyame (LLS – Ghana, Upper Guinea Project Coordinator)

CONSULTANTS

National Consultant on Legal Issues and Communications
National Training Consultant
International Consultant on Fire Management
International Consultant on Forest Restoration

Contact information Bureau Régionale pour l’Afrique Central et de l’Ouest (PACO)
BP 1618
Ouagadougou 01
Burkina Faso
Tel: +226 50 32 85 00
Fax: +226 50 30 75 61
paco@iucn.org

IUCN - The World Conservation Union
Rue Mauverney 28
CH-1196 Gland, Switzerland
Tel: +41 22 999 0001
Fax: +41 22 999 0002
Email: forests@iucn.org
<http://www.iucn.org/forest>

Forestry Research Institute of Ghana (FORIG)
University P.O. Box 63,

Kumasi, Ghana
Tel: +233 51 60122, 60123, 60373
Fax: +233 51 60121
dblay@csir-forig.org.gh

Resources Management Support Centre (RMSC)
PO. BOX 1457
Kumasi,. Ghana
Tel: +233 20 812 8844, +233 51 23366
obi yaw@rm sc.fcghana

2.3 Conclusion

Pertaining to Output one (1) of the project, i.e. the relationship between the use of resources by rural communities and effective fire management: the project revealed that inadequate practices in wildfire management were significantly related to inappropriate human behaviour. This was found to be second only to insufficient capacity by stakeholders to effectively plan, and engage control measures in wildfire management. As a result, it was proposed that any training in the prevention and management of wildfires should not only target fire volunteer squads but also engage representatives of the different social classes of communities, and be as broad and inclusive as possible. It is only through such an inclusive approach that inadequate cultural and social practices that promote wild-fires will effectively be checked. It was equally acknowledged that effective mobilization was important in the prevention and control of wildfires. For example, landscape benefits were greater in the years that communities disrupted all wildfires than in years that fires were not adequately prevented or controlled.

Pertaining to Output two (2) of the project, i.e. the determination of roles and responsibilities of key stakeholders in fire management: the project revealed that while the Ghana National Fire Service and the Forestry Services Division of the Forestry Commission were at the apex of importance and influence of fire management in Ghana, different stakeholders were important for different aspects of fire management i.e. education, law enforcement, community mobilization etc. Neither district level organizational stakeholders nor local level stakeholders could ensure effective fire management in isolation, hence the need for collaboration and institutional / stakeholder networking. Also, the effectiveness of stakeholders in executing their roles and responsibilities in fire management seemed to vary from one district to another depending on a variety of factors including past experience, capacity and motivation.

Concerning Output three (3) of the project, i.e. development and implementation of mechanisms for effective community based fire management: the project effectively developed and positioned fire warning panels and other tools, and developed exemplary fire management plans. Of significant importance was the developed and adopted Guidelines and Manual for Community-based Fire Management in Ghana.

Pertaining to Output four (4) of the project, i.e. rehabilitation of fire degraded areas using valuable species as determined by the local communities: the project effectively developed a large tree nursery which produced more than 250,000 tree seedlings. The project secured authorisation to map a Taungya Scheme within the Pamu-Berekum Forest Reserve and supported the planting by local communities of several thousands of tree seedlings in the secured section of the reserve.

Concerning Output five (5) i.e. identification and dissemination of existing legislation (including gaps) on community based fire management: the project shared information on fire legislation in the country during several workshops and proposed amongst others that (a) Traditional Authorities and District Assemblies should be empowered (through specially designed training) to formulate and enforce bye-laws for wildfire prevention and control , and (b) that fire education should be included in the curriculum of schools (basic

schools, and professional agricultural and forestry schools). It is hoped that these proposals will be taken up during future fire legislation reviews.

2.4 Recommendations

Because forest restoration is a time consuming venture, which depends on factors such as seasons, climate and the weather, the project developed a number of mechanisms which were not fully completed. For example, in order to promote the most adapted options, the project proposed that the planting of tree seedlings should not be limited to the Taungya Scheme in the Forest Reserve, i.e. some seedlings should be allocated to local plantings in individual farms in order to monitor the performance of two approaches (Forest Reserve versus private plantings) that will be the most fruitful in the future. For this to be effective, out-planting in private farms will require some scientific and technical supervision.

Also, the project started a process to legalise benefit sharing between the main stakeholders of the Taungya Scheme in the Pamu-Berekum Forest Reserve. This was not completed due to the length of time required for administrative authorities to complete such as process. A follow-up phase of the project is necessary to complete the benefit sharing agreement without which communities will not have a legal justification to benefit from carbon and other wood / ligneous products of the Pamu-Berekum Taungya Scheme.

Moreover, the end of project workshop cum forum also acknowledged as the community fire guidelines and manual promotion workshop, held in April 2011 in Kumasi, recommended amongst others, that:

- (a) Communities should be supported to take ownership of responsibilities in wildfire management through behavioral change approaches;
- (b) Training in the use of the community fire guidelines and manual document should be organized for different stakeholders in the different regions of the country;
- (c) The community fire guidelines and manual tool should be simplified into a more pictorial format to make it self-explanatory, including its translation into local languages for easy exploitation by communities;
- (d) The fire guideline and manual tool should be demonstrably implemented in the country. Feedback from such demonstrations would inform fire policy in the country.

Bibliography

- Ameyaw, J. & Amissah, L. (2007). Roles and Responsibility of Stakeholders in Fire Management in Begoro, Winneba and Dorma'a Districts of Ghana – Final Report (unpublished).
- Bertault, J. G. 1990. Comparaison d'écosystèmes forestiers naturels et modifiés après incendies en Côte d'Ivoire. In Puig (ed.).
- Damnyag, L. (2007). Report on Socioeconomic and Environmental Baseline data for Community-based Fire Management in Ghana. (Unpublished).
- FORIG (2007). Fire Management and Post-Fire Restoration with Local Community Collaboration: Report on Stakeholder Workshop – Dorma'a . (Unpublished).
- FORIG (2007). Fire Management and Post-Fire Restoration with Local Community Collaboration: Report on Stakeholder Workshop – Begoro. (Unpublished).
- Gautier-Hion, A. & G. Michaloud. 1989. Are figs always keystone resources for tropical frugivorous vertebrates? A test in Gabon. *Ecology* 70: 1826-1833.
- Hall, J. B. and M. D. Swaine. 1981. Distribution and Ecology of plants in tropical rain forest. Junk, The Hague.
- Hawthorne, W.D., 1994. *Fire and forest regeneration in Ghana*. O.D.A.. Forestry Series 4. Natural Resources Institute. Chatham, UK.
- Hawthorne, W.D., 1995. *Ecological profiles of Ghanaian forest trees*. Tropical Forestry Paper 29. Oxford Forestry Institute. vi+ 345 pp.
- Hawthorne, W. D. & M. Abu-Juam. 1995. Forest protection in Ghana. IUCN, Gland, Switzerland & Cambridge, UK
- Hawthorne, W. D. b(2007). Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report 2007. (Unpublished)
- Hawthorne, W. D., Owusu-Afryie, K., Gyakari, N. (2007). Fire Management and Post-Fire Restoration in Ghana: Final Technical Report on Survey of Key Resources (Unpublished)
- Hawthorne, W. D.(2008). Fire Management and Post-Fire Restoration in Ghana: Mission Report 2008. (Unpublished)
- Hawthorne, W.D. & C.C.H. Jongkind. 2006. Woody Plants of Western African Forests. A guide to the forest trees, shrubs and lianes from Senegal to Ghana. Royal Botanic Gardens Kew. U.K. 1023 pp.
- Jones, E. W. 1963. The forest outliers in the Guinea zone of Northern Nigeria. *Journal of Ecology* 51: 415-434.
- Juvelius, M. (2008). Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana : Mission Report 2008. (Unpublished).
- Kemp, R. H. 1961. Growth and regeneration of *Khaya grandifoliola* in 'Kurame' in southern Zaria province. Dept. Forest Research Nigeria Technical Note 10.
- Nganje, M. (2006a). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (7 to 16 August 2006)
- Nganje, M. (2006b). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (12 to 17 December 2006)
- Nganje, M. (2007). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (5 to 15 October 2007).
- Nganje, M. (2008a). Project Monitoring and Supervision – Fire Management and Post-Fire

- Restoration with Local Community Collaboration in Ghana: Mission Report (4 to 13 March 2008).
- Nganje, M. (2008b). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (6 to 15 October 2008).
- Nganje, M. (2009a). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (10 to 19 May 2009).
- Nganje, M. (2009b). Project Monitoring and Supervision – Fire Management and Post-Fire Restoration with Local Community Collaboration in Ghana: Mission Report (7 to 14 October 2009).
- Swaine, M.D., W.D. Hawthorne and K. Orgle. 1992. *The influence of fire on savanna vegetation at Kpong, Ghana*. Biotropica 24: 166-172.
- Swaine, M. D., D. Lieberman & J. B. Hall. 1990. Structure and dynamics of a tropical dry forest in Ghana. Vegetatio 88: 31-51.
- Taylor, C. J. 1960. Synecology and silviculture in Ghana. Nelson, Edinburgh UK.

Annex 1: Agenda of End of Project Workshop

Thursday 7th and Friday 8th April 2011
Miklin Hotel, Kumasi – Ghana.

Schedule	Agenda	Facilitator
Arrivals	Wednesday, 6th April	
16.00 – 18.00	Arrival of representatives	
	Thursday 7th April	
08.15 – 08.30	Registration	Secretariat
	Session 1: Opening & Guidelines [Chair – FORIG]	
08.30 – 08.40	1. Welcome address by Chairman	Dir. FORIG
08.40 – 08.55	2. Address by Traditional Authority	
08.55 – 09.10	3. Address by District Chief Executive	Mr. Opong Asamoah
09.10 – 09.45	4. Address by Regional Director, IUCN	IUCN
09.45 – 10.15	5. Opening Address by Minister / Representative	Mr. M. Abu-Juam
10.15 – 10.45	Coffee Break	
10.45 – 11.15	6. National Wildfire Management Policy	Mr. Alex ASARE
11.45 – 12.15	7. Community Fire Project & Outputs	Dr BLAY
12.15 – 12.45	8. Interpretation of Guidelines	Dr. MARFO
12.45 – 13.30	9. General discussions	Chairperson
13.30 – 14.15	Lunch Break	FORIG
	Session 2: Fire Stakeholder Debates [Chair of Panel – RMSC]	
14.15 – 14.35	1. Experiences of Traditional Authorities	
14.35 – 14.55	2. Experiences of Community Fire Brigades	
14.55 – 15.15	3. Experiences of women	
15.15 – 15.35	4. Experiences of the National Fire Service	
15.35 – 15.55	5. Experiences of Fire Research (FORIG)	Dr. K. Afriyie
15.55 – 16.15	4. Experiences of RMSC / GoG (Policy & Planning)	Dr. Ed. Abiaw
16.15 – 16.35	Coffee Break	
16.35 – 16.55	5. International Experiences of IUCN	Martin

16.55 – 17.30	6. Question & Answer Session	Chairperson
17.30	8. End of Session Two of Workshop	
	Friday 8th April	
	Session 3: Interpretation of Manual [Chair – IUCN]	
08.30 – 09.15	1. Wildfire Behavior	Lucy Amissah.
09.15 – 10.00	2. Wildfire Prevention	Dr. Ninnoni
10.00 – 10.30	3. Discussions on Fire Behavior & Prevention	Chairperson
10.30 – 10.45	Coffee Break	
10.45 – 11.30	4. Wildfire Pre-suppression	K. Afriyie
11.30 – 12.15	5. Wildfire Suppression	Dr. Victor Barnes
12.15 – 13.00	6. Discussions on Fire Pre-suppression & Suppression	Chairperson
13.00 – 13.45	Lunch Break	
13.45 – 14.05	7. Developing a community Fire management Network	IUCN
14.05 – 14.25	8. How and where to obtain help & support for Fire Mgt	IUCN
14.25 – 15.00	9. Discussions on sub-sessions 7 & 8 and development of workshop communiqué	Chair-person
15.00	10. Wrapping-up and Closing of Workshop	GoG

Annex 2: IUCN Speech at End of Project Workshop

MESSAGE FROM IUCN – PACO DURING THE OPENING OF THE WORKSHOP TO FACILITATE THE UTILISATION OF COMMUNITY FIRE GUIDELINES AND MANUAL FOR GHANA

Kumasi, 7th April 2011
Martin NGANJE

The Representative of the Minister of Lands & Natural Resources for Ghana – Mr. Musa Abu-Juam
The District Chief Executive for Dorma’a – Mr. Oppong Asamoah,
The Director of the Forestry Research Institute of Ghana – Dr. Victor Agyeman,
The Director of the Resource Management Support Centre – Dr. Edward Abiyaw,
The Representative of the Forestry Commission of Ghana – Mr. Agyeman Prempeh,
The Representative of the FAO Regional Office for West Africa – Dr. Atse Yapi,
Delegates and Representatives of Government Agencies and Civil Society Organizations,
Chairman, Invited Guests, Ladies and Gentlemen,

It is my pleasure to extend greetings to you from Professor. Aimé NIANOGO – Regional Director for the Central and West Africa’s Programme of the International Union for Conservation of Nature – IUCN. Professor NIANOGO has been monitoring the progress of IUCN’s interventions in Ghana and he would have liked to be with us at this important forum if not of other commitments that require his personal presence at this time. He therefore delegated me to transmit particular regards to the Government of Ghana through the Ministry of Lands and Natural Resources, and other partners including the Forestry Research Institute of Ghana, and the Resource Management Support Centre of the Forestry Commission of Ghana, for their fruitful collaboration over the years that has made this community fire capacity forum possible. Please accept his regards.

As many of you are aware, fire is considered one of the most important tools available to mankind but the lack of its efficient control and mastery is leading to enormous human, environmental and economic damage each year. The fire experts among us will recall the extensive and highly visible South East Asia fires of 1997 to 1998 which decimated more than 9.7 million hectares of forests resulting in 10 billion Dollars in economic losses, while affecting the health of more than 100 million people. Unlike such highly visible fires, the apparently unseen but repeated fires in Ghana in the last decade have caused a similar impact leading to the deforestation of about 30% of the country’s gazetted forests with huge negative economic and social consequences. As a matter of fact, scientists have discovered that fires are behaving differently now than in any other time in history. Humans have become the primary source of wildfires surpassing natural causes such as lightning. Global warming induced by humans, affecting rainfall patterns and drought are already influencing the way fires behave. It is now known that altered fire regimes constitute a threat to sustainable forest management in general and to biodiversity conservation in particular. Surprisingly, the management of fires is still not integrated in other landscape management efforts. Such insufficiency or excesses erode and reverse several years of good forest management and biodiversity conservation. The negative impacts are slow, hidden and long-lasting, even as their visible effects of soil erosion, poor soil fertility, floods and drought that lead to exacerbating poverty are seldom linked to wildfires.

Chairman, Invited Guests, Ladies and Gentlemen, we have so far failed to captivate the interest of our policy makers because our attention is triggered by acute events such as prolonged droughts or large fires. Now however we should know better. If we await the large scale trigger events, we will only discover the hidden fire effects when it is too late: --- when our cocoa farms will no longer be able to produce cocoa leading to inadequate funds to send our children to school, when shade dependent staples such as the cocoyam will disappear from the landscape leading to increased hunger and famine especially among the

poor, when dust storms will become common occurrences in our communities leading to poor soil fertility, health hazards and more--- and the list continues. The Government Ghana has indicated in its National Wildfire Management Policy of 2006 that fire management is a responsible endeavor that engages all sectors of the Ghanaian society. IUCN agrees and lauds such a position and orientation. It was this positive spirit that encouraged IUCN with financial support from the ITTO, to collaborate with the Forestry Research Institute of Ghana – FORIG, and the Resource Management Support Centre – RMSC to implement the Community Fire Management and Post-Fire Restoration with Local Community Collaboration Project in Ghana over the last four years.

The Community Fire Project as it is commonly referred sought to increase benefits to local communities from forest products in fire-prone areas of Ghana by promoting mastery of fire management interventions. This was expected to ensure the protection of timber, non timber forest products and other resources, as well as restore fire degraded lands with adapted local tree species. The Project exploited the participatory orientation provided by the National Wildfire Management Policy to identify stakeholders ranging from public and private agencies to local community groups in order to clarify their roles and responsibilities in fire management. This was followed by several contacts with key fire stakeholders, a review of existing fire legislation, a variety of studies and trainings and several workshops that have led to the development of the Guidelines and Manual for Community Fire Management, the first lot of which has been distributed to you today. It is IUCN's hope and expectation that the Guidelines and Manual will be useful and handy to all social groups involved in one way or the other in wildfire management in Ghana and beyond.

I am grateful for your patience while expecting successful deliberations during this forum/.

Thank you.

Martin NGANJE

Annex 3: List of Participants End of Project Workshop

	Name	Organization	Contact
1	Dr. Dominic BLAY	FORIG	Dblay@csir-forig.org.gh
3	Mr. Jonathan Dado	FORIG	Jdabo2@yahoo.com
4	Dr. Lucy Amissah	FORIG	Lamissah@csir-forig.org.gh
5	Dr. Owusu Afriyie	FORIG	koafriyie@csir-forig.org.gh
8	Alex Asare	RMSC	abasare99@yahoo.com
9	Dr. Yapi Atsé	FAO	Yapi.atse@fao.org
10	Félicité Mangang	IUCN	Felicite.mangang@iucn.org
11	Emmanuel Danquah	KNUST	ekadanquah@yahoo.com
12	Emmanuel Oteng	GEO	georgeahadzie@yahoo.com
13	Dr. Martin Nganje	IUCN	martin.nganje@iucn.org
14	Tech/Director :Abu-Juam Musa	MLNR	majuamuk@yahoo.co.uk
15	Dr. Edward Obiyaw	RMSC	konamventures@yahoo.com
16	F.N. Abbey	FSD Dorma'a	superwhiteagle@58gmail.com
17	Dr. Emmanuel Marfo	FORIG	Emarfo@csir-forig.org.gh
18	Emmanuel Antwi	FORIG	
19	Chief Nana Ofori Twum	Chief of Twumkrom	
20	Moses Yeboah	Sub-Chief Twumkrom	
21	Chief Nana Kwame Kyeremeh	Chief of Abosrakrom	
22	Opanin Kwabena Siaw	Sub-chief Abonsrakrom	
23	Chief Nana Dei Kusi	Chief of Assensu N° 1	
24	Moses Okrah	Sub-Chief Assensu N° 1	
25	Benjamin Kumi	Focal Pt. Twumkrom	0209234393 / 0246301323
26	Yaw Kyeremeh	Twumkrom	
27	Edward Frimpong	Twumkrom	
28	Biafra Mary	Twumkrom	
29	Attaa Akosuah	Twumkrom	
30	Kwabena Amponsa	Abonsrakrom	
31	Addae Joseph	Abonsrakrom	
32	Kusi Paul	Abonsrakrom	
33	Kyeremaah Florence	Abonsrakrom	
34	Twenewaah Elizabeth	Abonsrakrom	
35	Ya'a Lydia	Assensu N° 1	
36	Rose Yeboah	Assensu N° 1	
37	Edu Charles	Assensu N° 1	
38	Kweku Anini	Assensu N° 1	
39	Kofi Kyeremeh	Assensu N° 1	
40	Dr. Deka Siaw	Forestry School Sunyani	Dekasiaw2007@yahoo.com
41	Dr. Nat Owusu Prempeh	Forestry School Sunyani	npowusu@hotmail.com
42	Dr. Alex Afrifa	Forestry School Sunyani	Alexafrifa2004@yahoo.com
43	News Editor Daily Graphic	Daily Graphic Kumasi	
44	Support Staff Daily Graphic	Daily Graphic Kumasi	
45	K.G. Sampanye	GTMO	
46	Kester Mensah	FORIG	
47	Francis Tease	FORIG	
48	Mr. Odame Antiri Emmanuel	Forestry Comm Dorma'a	Resford78@gmail.com

49	John Atta Ameyaw (Fire Officer)	Fire Service Dorma'a	0208403414
50	Mr. Martin	Fire Service Dorma'a	0242121297 / 0272517666
51	Mr. Agyeman Prempeh	Forestry Commission - Accra	agyemanpremphe@yahoo.com
52	Mr. John Owusu	EPAG – Kumasi	envprotass@yahoo.com
53	Vincent Opong Asamoah	Municipal Chief Exec. Dorma'a	voppongasamoah@yahoo.com
54	Richard Ninnoni	RMSC	rkninnoni@yahoo.co.uk
55	Edward Awuah	RMSC Field	awuahedward@yahoo.co.uk
56	Mercy O. Ansah	RMSC Field	mercyowusuansah@yahoo.com
57	Valerie F. Nassah	RMSC Field	valfn2003@yahoo.co.uk
58	Dr. Victor Barnes	FRNR	rexbee2000@yahoo.co.uk
59	Dela Seshie	IUCN	Dela.seshie@iucn.org
60	Issaac Abrokwah	FORIG	