



Regional Pan-Asia / Pacific Consultation on Building Advanced National and Regional Capacities in Integrated Fire Management based on Participatory Involvement of Local Communities

20-22 November 2012
Lalitpur, Nepal



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1. Introduction

Community-Based Fire Management (CBFIM) is a type of land and forest management in which a locally resident community (with or without the collaboration of other stakeholders) has substantial involvement in deciding the objectives and practices involved in preventing, controlling or utilising fires.

The CBFIM approach is based on the principles of including local communities in the proper application of land-use fires (managed beneficial fires for controlling weeds, reducing the impact of pests and diseases, generating income from non-timber forest products, creating forage and hunting, etc.), wildfire prevention, and in preparedness and suppression of wildfires. CBFIM approaches can play a significant role in fire management, especially in those parts of the world where human-based ignitions are the primary source of wildfires that affect livelihood, health and security of people. The activities and knowledge communities generally practiced are primarily those associated with prevention. They include planning and supervision of activities, joint action for prescribed fire and fire monitoring and response, applying sanctions, and providing support to individuals to enhance their fire management tasks. Communities can be an important, perhaps pivotal, component in large-scale fire suppression, but should not be expected to shoulder the entire burden (FAO / GFMC Wildland Fire Management Terminology).

Faced with increasing fire occurrence and decreasing public budgets, government departments, local organizations, and forest users must consider a range of fire management options and experiences from around the world. Increasingly the solutions to the fire problems and the persistence of them year after year is suggesting that the reaction to fires to date in many countries needs to be reviewed. An active role of communities as proactive actors in fire management – in particular those which recognize the responsibility of civil society to plan and perform fire management activities -- may avoid pitfalls and mistakes of the past. These approaches are seen as more effective, less costly, and more sustainable over the long term.

At present, some countries of the Asia-Pacific region, particularly in the developing countries, are initiating CBFIM approaches to wildland fire management.

This is happening at a time when many countries of the Asia-Pacific region are noting an increase of forest fires and other vegetation fires. The increasing occurrence of extreme dry spells and heat waves currently observed, as well as climate modeling-based predictions (general circulation models), suggest that extreme weather periods favoring the recurrence of more frequent and larger wildfires and higher associated damages will aggravate in the coming years and decades in the Asia-Pacific region.

Wildfires if not well managed might pose not only immediate risk to the sustainability of forest and non-forest ecosystems, threat to biodiversity and the recreational, scenic, environmental and cultural value of forests. Populations of the surrounding areas may become seriously affected by injuries, death, and losses in properties. Post-fire secondary disasters such as landslides, mudflows or floods are additional threats to human populations, especially in the mountain terrains of the Asia-Pacific region.

The majority of wildfires are started by human activities, notably in the context of agricultural and pastoral land use. In the Asia-Pacific region several expert consultations have been held within the UNISDR Regional Wildland Fire Networks of South Asia, Northeast Asia, Southeast Asia and Central Asia on the future need of forest fire management. Key stakeholders directly and indirectly responsible in forest and land management, fire protection and emergency response, as well as representatives of local communities and civil society organizations, with support by international experts, were involved in these consultations. Altogether the problem of forest fires in the region are complex and should not be addressed on a sectoral level. In order to overcome the limited capacity in fire management there is a need to strengthen human and technical resources of agencies and local communities that deal with fire prevention and response. In addition, transboundary cooperation in fire management is needed to share the best appropriate knowledge in advanced approaches in fire management.

2. Objectives

The objectives of the consultation include:

- To bring together fire scientists, practitioners / managers, and policy makers to discuss global, regional as well as national level issues and concerns of wildland fire paradigms and management of wildland fire involving local communities as a key national approach in developing sustainable capacities in fire management
- To share knowledge and experiences of good practices in CBFiM among countries of the Asia-Pacific region and outside of Asia
- To elaborate the differences, opportunities and challenges of the role of communities in fire management throughout the region, especially under the light of changing socio-economic conditions, e.g.:
 - increase of the rural exodus in some countries, resulting in abandonment of land cultivation (agriculture, pastoralism), weakening of the young work force
 - reversed trends, e.g. ex-urban migration in some countries, e.g. in those regions where overpopulated urban areas do not offer sufficient resources for the livelihood of migrants
 - role of traditional and changing nomadic communities and fire management
 - role of modern "nomadic" communities: tourism
- To develop the concept of a regional activity in community-based fire management in the Asia-Pacific region
- To develop a draft concept of building a pilot activity in Nepal and at regional level to promote CBFiM approaches by establishing a Regional Fire Management Center for monitoring, capacity building and advisory services in fire management.

3. Conveners, auspices, sponsorship and partners

Conveners:

- Government of Nepal / Department of Forests (DoF)
- UNISDR-Regional South Asia Wildland Fire Network (RSAWFN)
- Nepal Forest Fire Management Chapter (NFMC)
- Global Fire Monitoring Center (GFMC)

Sponsorship:

- Korea Forest Research Institute (KFRI)
- Asia Pacific Association of Forestry Research Institutions (APAFRI)
- Global Fire Monitoring Center (GFMC)

Partners:

- The Korea International Cooperation Agency (KOICA)

4. Target Audience / Participants

Fire scientists, managers, professionals, policy makers, international institutions and representatives of civil society (local actors, NGOs) have been invited to contribute to the meeting (see list in *Annex B*).

ANNEX A: Final Programme

Day 1 (20 November 2012)

09.30 – 10.00 Registration

Opening Session

Chief Guest: Secretary, Ministry of Forests and Soil Conservation (MFSC)

Chair: Mr. Braj Kishor Yadav, Director General of Forests, Department of Forestry, MFSC

10.00 – 10.05	Welcome address: Mr. Yam Bahadur Thapa, Head, National Organizing Committee
10.05 – 10.10	Opening of the session by lighting the <i>Panas</i> : Chief Guest Dr. Krishna Chandra Paudel, Secretary, MFSC, Nepal
10.10 – 10.15	Introduction of the agenda and programme of the meeting: Mr. Sundar Sharma
10.15 – 10.20	Opening remarks: Dr. Koo Kyosang, on behalf of Dr. Gil Bon Koo, Director General, KFRI
10.20 – 10.25	Opening remarks: Dr. Sim Heok-Choh, APAFRI
10.25 – 10.55	Keynote: The Paradigm of Community-based Fire Management – From a Narrow Concept to a Broader Epistemic Application, by Prof. Dr. Dr.h.c. Johann G. Goldammer, GFMC
10.55 – 11.00	Inaugural address: Chief Guest Dr. Krishna Chandra Paudel, Secretary, MFSC, Nepal
11.00 – 11.05	Closing remarks: Mr. Braj Kishor Yadav, Director General of Forests, Department of Forestry, MFSC
11.05 – 12.10	Group Photo & Coffee Break

Sharing regional and international experiences in CBFiM (I)

Country Presentations (15 min presentation, 5 min discussion for each)

Chair: Dr. Oyunsanaa Byambasuren, Mongolia / GFMC

Rapporteur: Mr. David Asare, Ghana

12.10 – 12.30	Nepal
12.30 – 12.50	Indonesia
12.50 – 13.10	China

13.10 – 14.10 Lunch Break

Sharing regional and international experiences in CBFiM (II)

Chair: Prof. Bambang Saharjo, Indonesia

14.10 – 14.30	India
14.30 – 14.50	Bhutan
14.50 – 15.10	Mongolia
15.10 – 15.30	Russia
15.30 – 15.50	Republic of Korea
15.50 – 16.10	Coffee Break

Sharing regional and international experiences in CBFiM (III)

Chair: Dr. Xiaorui, Tian, People's Republic of China

16.10 – 16.30	Sub-Sahara Africa
16.30 – 16.50	Thailand
16.50 – 17.10	Discussion
18.00 – 20.00	Dinner

Day 2 (21 November 2012)

07.45 – 18.00 Study tour to Kabhre / Bhaktapur for visiting local forests and communities, as well as exchange of experiences between communities. Evening: Return to Godawari Village Resort, Kathmandu

Day 3 (22 November 2012)

Elaboration of contents of a draft project proposal

10.00 – 10.20 Summary of impressions of regional and international experience in CBFIM presented on Day 1. Rapporteur: Mr. David Asare, Ghana
10.20 – 10.40 Summary of impressions of the Study Tour (Day 2). Rapporteur: Mr. Siri Akaakara, Thailand
10.40 – 11.00 Summary of impressions by the main sponsor: Dr. Lee, South Korea
11.00 – 11.20 Draft proposal for the establishment of a Regional South Asia Fire Management Center: Prof. Dr. Dr. h.c. Goldammer / Mr. S.P. Sharma
11.20 – 11.40 Draft proposal for the establishment of a Regional Fire Management Training Center: Prof. Dr. Dr. h.c. Goldammer/ Mr. S.P. Sharma
11.40 – 12.00 Draft proposal for Participatory Forest Fire Management Project involving Local Communities in the National Forests of Nepal: Mr. Yam B. Thapa, DDG, DoF
12.00 – 12.20 Coffee Break
12.20 – 12.50 Discussion and soliciting thematic inputs from all participants of the consultation for drafting a national Nepalese and a Regional South Asian Programme in Integrated Fire Management
12:50 – 14:00 Lunch Break

Integration of National and Regional Needs for Informed, Capacitated and Coordinated Fire Management

Open Discussion moderated by GFMC

14:00 – 14:20 Fire management planning: Cross-sectoral aspects. Opening remarks by Prof. Goldammer
14:20 – 14:40 National Fire Management Policies. Opening remarks by Dr. Oyunsanaa Byambasuren, Mongolia
14:40 – 15:00 Advanced information systems (fire early warning, detection and monitoring). Opening remarks and presentation of initiatives by ICIMOD
15:00 – 15:20 Fire Management Training Needs
15:20 – 16:20 Regional Cooperation. Opening remarks by Dr. Byungdoo Lee, South Korea

Closing Session

Chief Guest: Honorable Minister of MFSC

Chair: DG, DoF

18.00 – 18.05 Remarks and Statement of the Consultative Meeting (Recommendations) by Mr. Sundar P. Sharma (RSAWFN / NFMC)
18.05 – 18.10 Remarks by Dr. Sim Heok-Choh (APAFRI)
18.10 – 18.15 Remarks by Dr. Koo Kyosang (KFRI)
18.15 – 18.20 Key Remarks by Special Guest, Prof. Dr. Dr.h.c. Johann G. Goldammer
18.20 – 18.25 Token of Love to International Participants by the Honorable Minister and the Secretary (MFSC)
18.25 – 18.30 Closing Statement by Chief Guest, Honorable Minister, Mr. Yadu Bansh Jha (MFSC)
18.30 – 18.35 Closing Remarks by the Chair, Mr. Braj Kishor Yadav (DoF)
19.00 – 21.00 Farewell Dinner

Day 4 (23 November 2012)

Pan-Asia Wildland Fire Network Meeting (invited participants)

08.30 – 08.35 Brief opening statement by KFRI (Dr. B. Lee)
08.35 – 08.40 Statement by Thailand (Mr. S. Akaakara)
08.40 – 08.45 Statement by Indonesia (Prof. Dr. Bambang Saharjo)
08.45 – 08.50 Statement by Bhutan (Mr. R.B. Mongar)
08.50 – 09.40 Discussion about the work programme
09.40 – 10:20 Coffee Break
10.20 – 12.30 Discussion and conclusions
12:30 Lunch

Evening: Departures of international participants

ANNEX B: List of Participants

INTERNATIONAL PARTICIPANTS

- Bhutan
- Germany / GFMC
- Ghana
- India
- Indonesia
- Malaysia
- Mongolia
- Nepal
- People's Republic of China
- Republic of Korea
- Russian Federation
- Thailand

HOST COUNTRY NEPAL

Participants from Ministry of Forests and Soil Conservation

INVITED INTERNATIONAL INSTITUTIONS, INGOS, NGOS, CIVIL SOCIETY ORGANIZATIONS, UNIVERSITIES AND MEDIA

- Global Fire Monitoring Center (GFMC)
- Asia Pacific Association of Forestry Research Institutions (APAFRI)
- The International Centre for Integrated Mountain Development (ICIMOD)
- World Wide Fund for Nature (WWF) Nepal
- Deutsche Gesellschaft für Internationale Zusammenarbeit [German Agency for International Cooperation] (GIZ)
- The United Nations Development Programme (UNDP)
- The Federation of Community Forestry Users, Nepal (FECOFUN)
- Association of Collaborative Forest Users Nepal (ACOFUN)
- Nepalese Federation of Forest Resource User Group (NEFUG)
- Media (Kantipur National Daily News Paper, Annapurna Post Daily News Paper, National TV)

**Welcome Address – Opening Ceremony
20 November 2012**

by

Mr. Yam Bahadur Thapa, Head, National Organizing Committee
Deputy Director General, Department of Forests, Ministry of Forests and Soil Conservation
Government of Nepal

On behalf of the Department of Forests and also of the conveners and on my own behalf, I would like to welcome you all to this *Regional Pan-Asia / Pacific Consultation: Building Advanced National and Regional Capacities in Integrated Fire Management based on Participatory Involvement of Local Communities* being held in the beautiful mountainous country Nepal.

It's our great pleasure that the our honorable Minister of the Ministry of Forests and Soil Conservation is with us despite his busy schedule to give this event a high value. I warmly welcome him this meeting.

Similarly, our respected Secretary of the Minister of the Ministry of Forests and Soil Conservation guided us from the inception of the meeting to date. I thank him welcome to this meeting.

Professor Johann Goldammer, a global fire leader is also with us. We deeply value his advice, guidance and support towards wildland fire management particularly to Nepal for many years. It's my great pleasure to welcome him again in Nepal.

Most importantly, I would like to welcome Dr. Koo and Dr. Lee from Korea Forest Research Institute as an emerging partner not only to Nepal but also to the Pan-Asia region, especially in the arena of wildland fire management. I warmly welcome them.

The Executive Secretary from Asia Pacific Association of Forestry Research Institutions, Dr. Sim's presence in this meeting will certainly open the areas of cooperation in wildland fire research in the Pan-Asia/ Pacific region. I also warmly welcome him in the meeting.

It's my great pleasure to welcome high level fire scientists, managers/ practitioners and policy makers from the four regions of Asia and beyond from 12 countries. I warmly welcome you all.

- Participants from international institutions, INGOs, NGOs, civil society organizations, universities, students and the media, representing from
- The Federation of community Forestry Users, Nepal (FECOFUN)
- Association of Collaborative Forest Users of Nepal (ACOFUN)
- United Nations Development Programme (UNDP)
- The International Centre for Integrated Mountain Development, ICIMOD
- Deutsche Gesellschaft für Internationale Zusammenarbeit [German Agency for International Cooperation] (GIZ)
- World Wide Fund for Nature (WWF)
- KANTIPU Daily
- Annapurna Post, and
- Nepal TV are also welcome

Fire hazard has remained as a major factor in forest destruction in Nepal. There are several reasons for the initiation of fire in the forest, but most of the forest fire events take place due to carelessness of people walking through forest trails connecting villages. The smokers throw cigarette butts on a dry forest floor without realizing the consequences. Sometimes the farmers in the lower areas make fire to prepare land and the fire goes uncontrolled taking the nearby forest in its grip. There are also cases where farmers deliberately use fire as a tool to burn the dead grass on the forest floor before the monsoon, so that the grass grows profusely in the following monsoon and thus providing a steady fodder supply to the animals. These anecdotes reveal that there are different causes of uncontrolled forest fires, but the consequences are always same: destruction and degradation of forests and

biodiversity. Once the trees die, it takes years to grow back to forest. In the meantime, erosion and landslides damage the forest floor in the steep slopes.

In the pursuit of developing and managing forests, the government in the last five decades placed a high priority on its socioeconomic aspect. It was important because the forest condition in the country deteriorated and came to a dismal state due to high demand for forest products. The resulting adverse impacts were visible every where. People faced shortage of firewood, fodder, and timber: the most crucial livelihood support of the majority of them. It was clear that pressure on the forest had to be reduced and the resource managed at the local level. The results of the past policies to involve people in management have been felt by the forest managers as well by policy makers. It makes all of us happy that forest cover is steadily increasing and the users have been empowered to make decision about forest resources at their will. Now, it is time for us to move beyond and look at other factors that destroy this valuable resource so that we can further empower the users with additional technical knowledge in reducing damages to the forests. Forest fire is one area that needs our immediate attention.

I hope that the experience shared, opinions expressed, here and the outcome of the meeting will help us develop an understanding of the way we need to follow in the coming days.

I once again welcome you all to the meeting and wish you a pleasant and comfortable stay in Kathmandu.

**Inaugural Address – Opening Ceremony
20 November 2012**

by

Dr. Krishna Chandra Paudel, Chief Guest
Secretary, Ministry of Forests and Soil Conservation, Government of Nepal

It gives me an immense pleasure to join you in this important events and inaugurate the '*Regional Consultation workshop on Building Advanced National and Regional Capacities in Integrated Fire Management*' being organized here in Godavari, Nepal. Allow me to extend our warm welcome to you all, particularly our foreign delegates, scientists and experts from different countries in this special meeting. I thank you very much for your valuable time, efforts and expertise to make this meeting happens in Godavari. I would like to express my sincere gratitude to the Korea Forest Research institute (KFRI) for its generous initiation to support forest fire management initiatives in the Pan- Asia region.

Distinguished delegates, we all know forests are important. So is fire if used carefully .However, the world is facing more problems and challenges on forest fire ever before due to climatic changes, increased temperature and population growth. Studies shows that 300-400 million of hectares (3-4 million km²) of forests and other lands are annually affected by wildfires. Increasing occurrence of forest fire and inadequate public investment has warned all of us, including governments, local organizations and forest users to consider a range of fire management options and experiences from around the world. In this regards, I consider this meetings very timely and important to learn and share from each other so that we can better understand the forest fire dynamics and prepare ourselves with practical solutions to keep our forests safe from fire.

Many countries in our regions share common forest fire problems, including Transboundary fires and smoke pollution. At present, some countries of the Asia-Pacific region, in the developing world, are initiating CBFiM approaches to wildland fire management.

We are here to discuss and plan for better forest fire management. Taking this opportunity, I would like to mention current forest fire situation in Nepal.

In 2009 alone forest fires claimed 49 lives injured 9 people. It destroyed about 147,000 hectares of forests. In 2010, a total of 9 people were reported dead, 3 people seriously injured, 431 houses were completely destroyed, and 92 animals killed. More than 82,000 hectares forests were burned. Most of these fires were spread either from community activities or someone set fire in forest for various reasons. It is also true that local people are the one to be in the forefront while beating such fires. This scenario urges us for immediate actions to prevent unwanted forest fires.

The government of Nepal has approved 'Forest Fire Management Strategy in 2010. The strategy focuses mainly on 'preventive measures', 'control measures' and rehabilitation of the burnt areas. Now, we are working on to implementation of this strategy.

We have about 40% forest area in Nepal. At present, over 20,000 community-based forest user groups are managing about 1.8 million hectares (about 30%) forest of the country. This approach has contributed in the conservation of overall natural environment and biodiversity. In addition, the community-managed forest areas are the source of basic forest products such as fire wood, timber, medicinal and other non-timber forest products of daily need to our people. Engagement of local communities has been an effective approach for the conservation and management of forest resource including for community empowerment, local institution development, forest governance and economic prosperity.

However, Nepal is not free from other forest related problems such as forest encroachment, illegal cutting, hunting and illegal trading of wildlife articles. Forest fire is considered as one of the main causes of forest destruction leading to loss of biodiversity, life and property of our people. We consider forest fire management as an indispensable part of our natural resource management efforts.

Also, we are engaged in preparing new strategy with new vision and priorities. Our Ministry is responsible policy formulation and capacity building of forestry staff, local stakeholder including communities living around the forest fringes. We are now organizing better for effective forest fire management, strengthening technological capacities and strengthening capacities of our staff.

I consider this 'consultative meeting' very timely and important to share our experience and knowledge on CBFiM in this region and beyond .This meeting is also important for the development of regional activity in community-based fire management in the Asia-Pacific region. I wish you all to think and sort out possible regional activities to promote CBFiM approaches. I am confident that this meeting will certainly draw a further direction for 'collaborative efforts' through enhancing 'inter-regional cooperation' for capacities building, networking and collective actions for wild land fire management.

Nepal stands with you all for any possible supports and collaboration in managing forest fire.

Finally, I would like to thanks Dr. Gil Koo from (KFRI), Dr. Sim from (APAFRI), Prof Goldammer from GFMC for your gracious presence and contribution.

I wish you all the very best in your deliberations and look forward to receive your inputs for a concrete road map for enhancing regional cooperation in forest fire management.

I also wish you all a pleasant stay in Godavari.

Thank you very much!!

**Introduction of the Agenda and Programme of the Meeting – Opening Ceremony
20 November 2012**

by

Mr. Sundar Prasad Sharma, Under Secretary (Tech.), Department of Water Induced Disaster Prevention, and Coordinator, UNISDR Regional South Asia Wildland Fire Network

This three-days "Regional Pan-Asia / Pacific Consultative Meeting" is being held in Nepal with Financial support from Korea Forest Research Institute (KFRI), the Global Fire Monitoring Center (GFMC) and the Asia Pacific Association of Forestry Research Institutions (APAFRI). I appreciate the support received from KFRI, GFMC and APAFRI which make it possible to bring participants from 11 countries of five regions including Sub-Saharan Africa in one place to discuss and share experience and knowledge on CBFiM.

To convene this meeting, the Department of Forests under the MFSC of Nepal took a lead together with the Regional South Asia Wildland Fire Network (RSAWFN), its Nepal Forest Fire Management Chapter (NFMC) and GFMC. For this, we have received a continuous guidance and advice from Prof Johann Goldammer, the Head of GFMC, in the preparation of this meeting.

Let me allow giving a brief account of the *Pan-Asia Wildland Fire Network* which is a 'Network of the Networks' within the four regions of Asia (North East Asia, Central Asia, South East Asia and South Asia) which are belonging to the UNISDR Global Wildland Fire Network.

- The Northeast Asia Region, which includes the Korean Peninsula, the Far East of the Russian Federation, Japan and China. This region is experiencing increasing occurrence of forest fires with negative consequences on sustainability of ecosystems, biodiversity and forest productivity.
- The Central Asia Region, which includes Mongolia, Northern China, the Russian Federation (Siberia), and the Central Asian States (Kazakhstan, Tajikistan, Kyrgyzstan, Uzbekistan). The region is affected by continental dryness, widespread illegal logging and increasing wildfires, which are threatening sustainable forest management and regularly resulting in regional smoke pollution.
- The Southeast Asia Region, covering the member states of the Association of Southeast Asian Nations (ASEAN). The region is faced by impacts of excessive fire application in land-use change, notably in rain forest and peat biomes, as well as wildfires in seasonally dry forests.
- The South Asia region, which is including countries of mainland South Asia, member countries the South Asian Association for Regional Cooperation (SAARC). This region is faced with increasing pressure of forest fires, particularly in mountainous terrain, with severe consequences of secondary disasters such as landslides, erosion and floods.

Many countries within the four regions of Asia are partners in economic and cultural activities. Some of them are sharing common forest fire problems, including transboundary fires and smoke pollution.

I would like to take this opportunity to brief the important audience of this Meeting about the recent past activities regarding wildland fire management initiatives under the Global Wildland Fire Network towards need for establishing Pan Asia Wildland Fire Network to enhance inter-regional cooperation.

The Joint Meeting of the Wildland Fire Advisory Group / Global Wildland Fire Network in Freiburg, Germany in 2008:

- recognized the need for collective action of countries of Pan Asia region technology and data sharing for wildfires disaster risk reduction

The 1st Pan-Asia Forest Fire Consultation in Busan, South Korea in 2009:

- agreed to established Pan Asia Wildland Fire Network under UNISDR-Global Wildland Fire Network – The secretariat of the Network to be established in South Korea.

The 2nd Pan-Asia & 7th North-East Asia Wildland Fire Network Meeting in South Korea 2011 expressed the:

- Need to enhance cooperation among countries in the Asia region aimed at sharing technology, expertise and data in fire management

In the 5th International Wildland Fire Conference in South Africa 2011, delegates of Regional Session of Asia cluster recommended, among other:

- Member countries should promote inter-regional cooperation, including joint investigations, joint fire management demonstration projects, consultations, and conferences;
- To strengthen the UNISDR Pan-Asia Wildland Fire Network;
- Technological and financial support must be provided by donor communities to financially disadvantage countries in building capability to wildland fire management.
- To hold a consultative inter-regional meeting among the networks of South Asia, Southeast Asia, Northeast Asia and Central Asia, by inviting the Sub-Sahara Africa Wildland Fire Network for sharing knowledge on Community-based Fire Management (CBFiM) approaches in 2012.

His consultation is one of the outcomes of the recommendations of the 5th International Conference. The main objectives are:

- To share knowledge and experiences of good practices in CBFiM among countries of the Asia-Pacific region and beyond.
- To elaborate the strength, differences, opportunities and challenges of the role of communities in fire management throughout the region, especially under the light of changing socio-economic and political conditions,
- To develop the concept of a regional activity in community-based fire management in the Asia-Pacific region
- And, to develop a draft concept of building a pilot activity in Nepal and at regional level to promote CBFiM approaches by establishing a Regional Fire Management Center for monitoring, capacity building and advisory services in fire management.

Today, after this opening session, we basically share regional and international experiences in CBFiM targeting towards integration of National and Regional Needs for Informed, Capacitated and Coordinated Fire Management.

Tomorrow, we will go for a field visit to Kavre and Bhaktapur districts. Please refer the programme of the field visit in your folder. The Nepalese participants who have not visited to the site before and interested in are requested to register your name for the field visit.

In the third day, in the first half we will

- Summarize impressions of regional and international experience in CBFiM towards strength, differences, opportunities and challenges of the role of communities in fire management throughout the region
- Discuss on new regional initiatives and pilot projects

In the second half, we will

- Discuss and solicit thematic inputs from all participants and come up with the 'Conclusions and Recommendations' of the meeting for the future direction.

At last, I also on behalf of Nepal Forest Fire Management Chapter (NFMC), would like to thank you all for your participation to this very important meeting and wish you all the bests for a productive meeting to draw a road map towards wildland fire management in the Pan-Asia Region.

**Opening Address
20 November 2012**

by

Dr. Gil Bon Koo, Director General, Korea Forest Research Institute
Seoul, Republic of Korea

I am truly honored to have this opportunity to deliver an opening address to this special occasion today for "Community based Fire Management and Implementation". Especially I express my wholehearted appreciation to the Minister of the Ministry of Forests and Soil Conservation, staff members and guests for attending the 'Regional Pan-Asia / Pacific Consultation on Building Advanced National and Regional Capacities in Integrated Fire Management based on Participatory Involvement of Local Communities' despite your tight schedule in this busy season in dealing with forest fire.

On behalf of the Korea Forest Research Institute, I would like to express my gratitude to Mr. Yam Bahadur Thapa, Head, National Organizing Committee, Professor Johann Goldammer, chair of the Global Fire Monitoring Center, Dr. Abd Latif Mohmod, chair of Asia Pacific Association of Forestry Research Institutions, for your efforts in making this consultation happen.

Today, the global community is faced with a major challenge of climate change induced by global warming. More forest fires are occurring than in the past, bringing about more property damages. This negatively affects the sustainability of the ecosystems, biological diversity and forest productivity, as well as local communities that make their living out of forests.

Most of wildfires are caused by human activities, notably in the context of agricultural and pastoral land use. Therefore, participatory involvement of local communities is very important for the successful forest fire management. In this aspect, Community-Based Fire Management approach is the proper solution in some countries of the Asia and Africa region, especially in the developing countries.

I hope that this consultation will be an opportunity for an international discussion in search of better fire management strategies by establishing matters of common interest, and sharing their views and experiences of good practices in CBFiM and international cooperation.

I would like to thank all the staff members for your endeavors in preparing for this symposium.

In closing, I wish all of you good luck and good health.

**Opening Address
20 November 2012**

by

Dr. Abd Latif Mohmod
Chairman, Asia Pacific Association of Forestry Research Institutions (APAFRI)
Director General, Forest Research Institute Malaysia

Presented by Dr. Sim Heok-Choh, APAFRI Secretariat

First and foremost, allow me to apologize on behalf of the Chair of APAFRI, Dr Abd Latif Mohmod, who is also the Director General of Forest Research Institute Malaysia (FRIM), for unable to be with us here this morning due to other pressing matters.

On behalf of the Asia Pacific Association of Forestry Research Institutions (APAFRI), permit me to take this opportunity to congratulate the Nepal Forest Fire Management Chapter for organizing this very important meeting for the Asian region.

APAFRI is honored to be given a chance to support this important international meeting, with generous financial contributions from the Korea Forest Research Institute.

Since 2007, the Korean Government, through the Korea Forest Research Institute (KFRI), has allocated a portion of its contributions to IUFRO for activities to be carried out in the Asia Pacific for forestry practitioners of this region. APAFRI is honored to be entrusted with the responsibilities of managing this portion of the fund. APAFRI has used the 2007 allocation for partially financed the International Conference on Traditional Forest-related Knowledge in Kunming China, the 2008 allocation for organizing an Asia Pacific Forest Health Workshop in Kuala Lumpur, the 2009 allocation for an Asia Pacific Forest Products Workshop in Sri Lanka, the 2010 allocation for the Asia and the Pacific Symposium on Vulnerability Assessment in Manila Philippines, and last year, 2011, APAFRI has organized an Asia and Pacific Workshop on Multinational and Transboundary Conservation of Valuable and Endangered Forest Tress Species in Guangzhou, China. Proceedings for these five events have already been published by IUFRO as IUFRO World Series Volumes 21, 24, 27, 29 and 30.

Forest fires not only destroy tens and hundreds of thousand hectares of forests every year, they also produced haze which could be swept across a wide area affecting the environment and vegetations, and hence could harm the health and livelihoods of millions of people in many countries.

Many factors could contribute to the increase of severity and frequency of forest fires including climate change and growing population, and efforts at both national and regional levels have over the years strived to manage this hazard with the aims of reducing its impacts on human wellbeing.

The ASEAN countries, for example, had signed an agreement on Transboundary Haze Pollution in 2002, to prevent and monitor transboundary haze pollution as a result of land and/or forest fires which should be mitigated, through concerted national efforts and international cooperation. Internationally, the Food and Agriculture Organization of United Nations (FAO) had compiled a set of guidelines on fire management, and APAFRI has assisted FAO in organizing a workshop in Pekan Baru, Indonesia, in 2008, to introduce this set of voluntary guidelines to the ASEAN countries.

With an ambitious aim of *Greening the Asia Pacific*, APAFRI is an NGO with over 66 institution members from over 20 countries in the Asia Pacific region. Its secretariat is currently hosted by the Forest Research Institute Malaysia (FRIM). Officially launched in 1995 during a meeting of the Heads of Forestry Research in the Asia Pacific in Indonesia, over the past nearly 20 years APAFRI has organized many events in the form of meetings, workshops, seminars, symposiums and conferences, within the region with the primary objective to enhance collaboration between the members and also for information exchange. These events cover a very wide scope, ranging from general forestry, poverty reduction, traditional knowledge, pest and diseases, conservation and sustainable utilization, to forestry for climate change mitigation and adaptation. The ultimate aim is to contribute to building

up the critical mass necessary for the sustainable management of the precious forest resources in the region.

APAFRI is continuously exploring opportunities to work with the other regional and international organizations on activities and programmes which will, directly or indirectly, contributing to forestry research and development in greening the Asia Pacific region. The opportunity to participate in forums such as this one here this week would be invaluable for APAFRI, both to promote our efforts in raising the awareness of the vital contributions of forests to human wellbeing, and in the process to further enhance our linkages with other organizations with similar and related objectives.

Thank you very much, and I wish you all a very successful and fruitful meeting here in this beautiful resort in Nepal.

**The Paradigm of Community-based Fire Management:
From a Narrow Concept to a Broader Epistemic Application**

by

Prof. Dr. Johann G. Goldammer, Director, Global Fire Monitoring Center (GFMC)
Freiburg, Germany

During the last two decades the need has been recognized globally that the participation of civil society in fire management is the key for a successful approach in reducing the inappropriate application of fire in land-use systems and in the prevention of wildfires. The approaches of involving civil society in fire management, however, are facet-rich, largely depending on the cultural context and the ecosystems, land-use systems and landscapes concerned.

Inhabitants of landscapes throughout the world have possessed inherited traditions and customs in fire management, many of them rooted in the empiric experience of rural societies who had learned to live with fire, utilize fire, and to protect their assets and lives from fire. Many cultural fire regimes, however, have been affected, changed and in many regions cultural fire regimes have been lost as a consequence of the transition of indigenous rural societies to colonial, industrialized and otherwise globalized societies. In some regions, in which historically people have not been confronted with wildfires, new problems are arising: Human-made disturbances coupled with the effects of climate change are creating conditions of high fire hazard that are unprecedented in the recent history.

In the industrial countries a culture of civil society involvement gave birth to voluntary fire brigades and later on to environmental protection movements, which created public awareness and civil engagement in the protection of natural resources, including protection of forests and other vegetation to become affected by wildfires.

The last two decades of the 20th Century saw an increasing acceleration of inappropriate, damaging application of fire in land use and land-use change, notably in the tropics and the adjoining developing world. Rapidly increasing rural populations seeking for land and livelihood brought fire into rainforests, mountain forests and wetlands, places that had not been subjected to anthropogenic or natural fire in historic timescales.

At the same time industrialized countries experienced an unprecedented encounter with wildland fires. Two opposite trends are noted:

- Migration of rural inhabitants to urban areas, seeking employment opportunities and urban lifestyle
- Movements of urban inhabitants to the "countryside" to flee overcrowded, polluted and otherwise stressed metropolitan areas and to settle in adjoining natural landscapes

Both directions of population movements are involving a change or increase of wildfire threats, both have a social and economic background. Poverty-driven migrants using fire in opening natural ecosystems for agricultural use and applying fire to clean fields and pastures, are still the major causative agent for wildfires in many regions of the tropics, where – besides industrial land exploitation – subsistence farmers continue to convert native vegetation by fire, in the Amazon and Zaire basins, or in Southeast Asia. We will hear more about it by the contributions from Indonesia. And there is a similar trend of encroachment and fire use in mountain ecosystems such as in the Himalaya and Hindu Kush region. Associated with an acceleration of regional warming and dryness land-use fires in the Himalayas have resulted in major wildfires during the last years. Examples will be given by the presentations of our colleagues from Bhutan and Nepal

The opposite migratory movements – rural people driven by poverty to the growing urban centers – often leave behind formerly cultivated landscapes, which, on their development "back to nature", represent are forming stages of extremely high wildfire hazard. Rural exodus and abandonment of land cultivation is resulting in succession and increasing availability of combustible materials to wildfire hazard and thus increasing sizes, intensities and severities of wildfires, a trend that can particularly be observed in the Eurasian region

Conversely, exurban movements of metropolitan inhabitants to the “countryside” are trend in many industrial countries and involve increasing spread of building homes for commuters, weekenders, vacationing people and urban pensioners to highly flammable wildlands. Predominantly these populations have an urban lifestyle involving sometimes some gardening, but not land cultivation. As a consequence both the structures and the encroached wildlands are becoming more vulnerable to wildfires, as fire causers and recipients.

So, no wonder when fire users, causers, defenders and victims have to overcome rather different fire problems in a broad range of diversity of natural, environmental and socio-economic settings, additionally diversified by the superimposed political systems and cultural regimes.

So, how different are, or how much in common have the variety of people-centered approaches in fire management?

These are questions which will be addressed during this consultation. We will see that traditional participatory approaches in forest and fire management have commons, as is the case in some African and Asian landscapes – we will hear the commons of community involvement in Ghana and India. Within Asia alone the confrontation of communities with fire differ extremely between high-mountain Nepal and Bhutan, equatorial lowland tropical Indonesia and seasonal tropical Thailand. And other countries industrializing with a rapid pace like South Korea and Japan, have left a decreasing number of rural communities using fire or being confronted with wildfires.

In the following I would like to report provide some thoughts on the recent development in temperate-boreal Eurasia, i.e. in the “greater Europe” stretching from the Atlantic coast in the West to the Pacific shores in the Far East.

In many regions of Eurasia rural settlements (villages, towns, scattered farmsteads) and other rural assets (agricultural fields / crops, infrastructures and other values at risk) are increasingly endangered by wildfires. This trend is driven by the consequences of land-use change, regional climate change and particularly by the rural exodus, which has resulted in the weakening of rural work force and self-protection ability, and increasing wildfire hazard on abandoned lands.

Vice-versa, increasing industrialization and concentration of populations in some areas exert a high pressure on natural resources for land use change, which is reflected by the high frequency of arson and ‘unknown’-cause fires in the wildlands. The intermix of human settlements with natural ecosystems and the fires burning at the interface between wildlands and rural settlements in many places create severe problems, which have become a major issue of political debate and confrontation.

Recent major wildfire disasters in Europe reveal that government authorities and civil society, notably rural communities, are not sufficiently prepared to prevent and reduce the risk of wildfires, to defend rural communities and rural assets at risk, and to protect human health and altogether human security against the adverse direct and indirect impacts and consequences of wildfires.

Guidelines are needed that will provide information to local inhabitants (farmers, community leaders, local fire service units, volunteer firefighters and village defense committees) with state-of-the-art information on wildfire damage prevention measures, and pragmatic measures for the defense of settlements and rural assets threatened by wildfires. With such guidelines local communities will be capacitated to apply all fire safety regulations for protecting the structures of the community (clearing vegetation, provide extra sources of water, application of appropriate building codes and use of appropriate materials, etc.) and for the protection of rural populations against the adverse effects of vegetation fire smoke pollution on human health and security. Also, the problem of fires burning on terrain altered by human activities, such as fires affecting dispersed, sometimes abandoned structures, waste deposits / garbage dumps and otherwise contaminated lands, needs to be addressed due to the highly toxic emissions generated by co-burning of natural vegetation and technical / chemical produce.

In order to meet the demands for enhancing the capabilities of local rural communities to defend themselves against wildfires we are now developing guidelines entitled “Guidelines for the Defense of Rural Populations, Settlements and Other Assets against Wildfires and Smoke Pollution” in order to:

- Provide a practical technical document designed as a support tool for the protection of people and communities in temperate-boreal Eurasia from wildfires;
- Serve as a starting point and basis for the exchange of expertise and concepts within the Council of Europe / UNECE member states to continuously expand capacities in rural fire management.

The Guidelines will be prepared with the support from the European and Mediterranean Major Hazards Agreement (EUR-OPA) set up by the Committee of Ministers of the Council of Europe. The collaborating centers are the European Forest Fire Center (GR), the Global Fire Monitoring Center (DE), the Regional Southeast Europe / Caucasus Fire Monitoring Center (MK) and the Eastern European Fire Monitoring Center (UA). Members of the UNECE/FAO Team of Specialists on Forest Fire and the UNISDR Regional Eurasian and SE Europe / Caucasus Wildland Fire Networks will contribute to the development of the guidelines.

In the development of these guidelines we are carefully looking at the differences and the common issues of the role of civil society to take responsibility to preserve the cultural, ecological and socio-economic environment of their homeland, as well as the protection of human health and security from the adverse impacts of wildfires are explained.

The main objectives of the Guidelines are to empower individuals and local communities to take responsibility and action in the prevention of wildfires, and in the preparedness and defense of their lives, homes, villages and rural assets against wildfires.

Both ethical and pragmatic considerations are highlighted why there is a need to have leaders who take responsibility. On the ethical side civil society has the prime responsibility to manage and protect their homeland on a sustainable base for maintaining the ecological and environmental functions, the productivity and the carrying capacity of their homeland for future generations. This responsibility is increasing since climate change all over the Eurasian region is already resulting in the recurrence of extreme weather events, including extended droughts, which effect land-use systems and favour the occurrence of severe wildfires. With accelerating problems of national and global economies, expected migration of human populations threatened by climate change, the capacities of governments will become limited in taking all measures and responsibility for fire protection. Thus, civil society shall encourage and recognize those who are capable to guide, instruct and take responsible leadership within rural communities to empower the community to defend their homeland against the adverse effects of wildfires, and to be available as liaison (contact) to the public authorities in case of wildfire emergencies.

The Kathmandu Consultation and Beyond

The approaches in community involvement in fire management are facet-rich and include fundamental participatory principles, consideration of land tenure and forest-user rights, concepts of volunteerism, or programmes of poverty-alleviation or job-creation. Programmes called *Firewise* and *Firesmart* are aimed for reducing the loss of investments and human lives in the subdivisions spreading to the wildlands of the industrial countries.

Community-Based Fire Management as a term and philosophy received its main attention in the aftermath of one of the most significant fire episodes in human history – the extended fires used for the removal of native vegetation during a drought associated with an El Niño-Southern Oscillation (ENSO) event in 1997-98 in Southeast Asia. The amount of vegetation burned by vegetation conversion fires and wildfires in Indonesia within a few months may have corresponded to similar historic land-clearing in other continents, but with the distinction that similar land clearings in other regions globally stretched over decades or centuries, and not occurring during a few weeks or months, and less populations and observers were present to record magnitudes and impacts of such historic events.

In response to the situation in Indonesia principles of Community-Based Fire Management were tested in a number of pilot projects in the region, many of which were abandoned after the termination of international donor support.

Similarly, continuing community involvement failed in places where government provided incentives or subsidies for successful fire prevention and exclusion, but projects fell apart when government funding dried up.

Other approaches have been disconnected from a cohesive national approach; or a cohesive national approach was not existing, and thus community-based approaches were isolated, inefficient and often silently phased out and were forgotten.

Based on the experiences in community involvement in fire management in the region and recognizing the need that countries need to develop and implement national cohesive fire management policies and implementation strategies it is worth to consider the early experiences in community involvement throughout the globe. In Asia the Indonesian experience, very much reflected by the work of the "CBFiM pioneers", Hartmut Abberger and Edy Marbyanto, as expressed in their 2004 report "Community Based Fire Management (CBFiM) in East Kalimantan – Concept and Strategies", needs to be taken out of the shelves and explored for application. The toolboxes are there, glossy meta-brochures are not needed any longer, what is needed is implementation.

Numerous other approaches on mainland South Asia, e.g. in Nepal and Thailand, need to be considered and should be put in the context of the need of building national capacities in fire management in which advanced technologies of fire early warning, satellite based monitoring systems, communication and decision-support systems, are needed as much as the grassroot-level approaches in fire management. Here I see an opportunity for a cooperation between the host and the main sponsor of the conference, the Democratic Republic of Nepal and the Republic of Korea. Dr. Lee of the Korea Forest Research Institute will report about his experiences in Korea and we need to define if they are applicable in Nepal and adjoining countries.

This consultation is offering a first opportunity for discussion of concepts and directions of building capacities from national to local level, and even considering the transboundary cooperation between neighbouring countries and specialized institutions are regional to global level, to supply information for fire management decisions, which would finally reach the communities in need. Enhancing national capacities in fire management would greatly benefit from the strengthening of regional cooperation through which the South Asia nations will continue to share information, data and expertise. The establishment of a Regional Fire Management Resource Center for South Asia (or Regional Fire Monitoring Center) could strengthen the already existing work of the UNISDR Regional South Asia Wildland Fire Network – a development which has good examples in the recently established Regional Southeast Europe / Caucasus Fire Monitoring Center in the FYR Macedonia, the Eastern European Fire Monitoring Center in Ukraine, and the planned Central Asian Fire Monitoring Center in Mongolia.

In conclusion of these initial thoughts I would like to refer to the opening address of UN Secretary General Ban Ki-moon to the last International Wildland Fire Conference in South Africa in May 2011, which I had the honor to convey to the conference attendees. Secretary General Ban Ki-moon stressed:

"Wildland fires destabilize ecosystems and the global atmosphere, and have clear implications for human health and security. Unlike other natural hazards, wildland fires are primarily caused by human activities. Measures to prevent them – such as education, awareness-raising and capacity-building – are well known and within reach. Community-Based Fire Management is particularly important."

Globally as well as here in the Asian region the vast majority of fires are caused by people, thus they can be prevented and controlled. Thus, any fire management system, regardless if based on advanced technologies, or on traditional knowledge, can only work if people are participating actively and taking responsibility.

The Secretary General further stated:

The transboundary effects of wildland fires associated with long-range smoke transport and emissions are prompting the international community to strengthen cooperation in fire management. International organizations and civil society groups are working to build capacity, develop advanced technologies and promote sustainable land-use practices.

The UN system is strongly committed to this effort. Our work encompasses many aspects of fire management, including agriculture, forestry, health, science, the environment, emergency response and weather forecasting and monitoring.

We welcome the efforts of fire specialists to build a culture of prevention and to develop a spirit of global cooperation.

The UN system is available to provide the best professional advice, to support countries in developing land and fire management policies and fire management capacity with the ultimate aim to make natural and cultural ecosystems resilient to damaging fires. But the success of all these efforts are depending on the active participation and taking responsibility of civil society. I thank the sponsors, organizers, hosts and contributors of this consultation to work together this week for obtaining the best results by drawing expertise from the specialists attending, and the local views and visions of the host country Nepal. The Global Fire Monitoring Center and the Global Wildland Fire Network are offering the continuation of support to the Democratic Republic of Nepal and the Republic of Korea in building partnerships, creating synergies and generate the necessary political awareness to address the increasingly pressing problems of wildfires globally.

**Inaugural Address – Opening Ceremony
20 November 2012**

by

Dr. Krishna Chandra Paudel, Chief Guest
Secretary, Ministry of Forests and Soil Conservation, Government of Nepal

On behalf of the Ministry of Forests and Soil Conservation, I would like to express my sincere gratitude to the Korea Forest Research Institute (KFRI) for its generous initiation to support forest fire management initiatives in the Pan-Asia region. I also extend my warm welcome to the delegates who join us at this major event '*Regional Pan-Asia / Pacific Consultation on Building Advanced National and Regional Capacities in Integrated Fire Management based on Participatory Involvement of Local Communities*' in Nepal.

Faced with increasing fire occurrence and decreasing public budgets, government departments, local organizations, and forest users must consider a range of fire management options and experiences from around the world. One study shows that 300-400 million hectares (3-4 million km²) of forest and other lands annually affected by wildfires.

Many countries within the four regions of Asia are also sharing common forest fire problems, including transboundary fires and smoke pollution and are partners in economic and cultural activities. At present, some countries of the Asia-Pacific region, in the developing countries, are initiating CBFIM approaches to wildland fire management.

We are here to discuss forest fire management, because in most countries in this region, has been a crucial problem. Taking this opportunity, I would like to mention current forest fire situation and forestry sector in Nepal.

In 2009 alone forest fires claimed 49 lives injured 9 people. Fires destroyed about 146,742 hectares of forests. In 2010, a total of 9 people were reported dead, 3 people seriously injured, 431 houses were completely destroyed, and 92 animals killed. More than 82,000 hectares forests were burned. This scenario urges us for immediate actions to prevent unwanted forest fires.

The Government of Nepal has approved 'Forest Fire Management Strategy in 2010. The strategy focuses mainly on 'preventive measures', 'control measures' and rehabilitation of the burnt areas. Now, we are working on to implement the strategy.

The total area covered by forest in Nepal is about 40 per cent. At present, more than 24,000 community-based forest user groups are managing about 1.8 million hectares (about 30 per cent) of the forest areas, with resulting protection of the environment and biodiversity. In addition, the community-managed forest areas, through sustainable management approaches, serve as supplies of basic forest products such as fire wood, timber and medicines. This kind of approach by collaborating with local communities has been a valid strategy for forest resources management. The implementation modality has achieved gender-balanced principles, community empowerment, and sustainable institutional development in forestry governance and economic prosperity.

Forest fire is considered as the main cause of forest destruction in Nepal. Forest fire management is an indispensable part of our natural resources management efforts.

The Ministry of Forests and Soil Conservation is responsible for implementing forestry sector policies and monitoring their impact. Although, the Ministry is responsible for policy formulation our staff have insufficient managerial capacity in wildfire management. Therefore, the capacity for implementing and monitoring on fire management certainly demands further strengthening.

We are prepared to take necessary initiative in strengthening technological capacities on wildfire management. We are reviewing the Master Plan and formulating new strategy.

I am sure that this 'consultative meeting' having the objectives of (a) sharing the experience and knowledge on CBFIM in this region and beyond and (b) to develop the concept of a regional activity in community-based fire management in the Asia-Pacific region, and (c) to develop a concept of building a pilot activity in Nepal and at regional level to promote CBFIM approaches will certainly draw a future direction for 'collaborative efforts' through enhancing 'inter-regional cooperation' for capacity building, networking and collective actions for wildland fire management.

Also, I would like to appreciate and acknowledge KFRI initiation for their generous support towards Wildland fire management in Nepal in particular and in Pan-Asia region in general. And I also thank to Prof Goldammer from GFMC for creating an enabling environment in this regards.

I wish you the very best in your deliberations and look forward to receive your inputs for a concrete road map for enhancing regional cooperation in general and forest fire management in Nepal in particular by sharing experience, analyzing regional capabilities.

I also wish you all a pleasant stay in the beautiful Godawari Resort in Nepal.

I now declare this meet open and I thank you very much.

**Closing Remarks of the Opening Session
20 November 2012**

by

Mr. Braj Kishor Yadav, Chair, Director General, Department of Forests
Ministry of Forests and Soil Conservation, Government of Nepal

On behalf of the Department of Forests and also from the National Organizing Committee, I would like to express my sincere gratitude to the Korea Forest Research Institute and the Global Fire Monitoring Center for their generous initiation to support forest fire management in the Pan-Asia region. I also extend a warm welcome to the delegates who will join us at this 'Consultative Meeting of Pan-Asia / Pacific Region on Forest Fire Management'.

As it is appropriate to the occasion, I would like to mention current situation of forest resources and forestry sector. Community-based resource management is the main 'management' regime of our natural resources. However, Nepal is facing technological and financial resources constraints to manage our forest sustainably. Forest fire management is the key component to sustainable forest management. But, due to lack of awareness and capability, every year we helplessly witness human casualties, loss of properties and destruction forest resources. I think the situation is also similar to many countries in the Asia region particularly to the developing countries.

I believe your deliberation during these three days will certainly draw common guidelines applicable to the Asia region dealing with forest fire.

At last, I warmly welcome you all and wish for a pleasant stay in Nepal.

With this, now I declare closing of the opening session and I thank you very much.

**Forest Fire Regimes in the Hindu Kush-Himalayan region and Community-based Fire
Management in Nepal**

by

Mr. Sundar P. Sharma, Department of Water Induced Disaster Prevention (DWIDP)
Ministry of Water Resources, Government of Nepal
Coordinator, UNISDR-Regional South Asia Wildland Fire Network
Member, UN-ISDR Wildland Fire Advisory Group and Global Wildland Fire Network

Forest fires are more common in lowlands in the Hindu Kush-Himalayan region during the hot dry and windy summer seasons (February to May). These fires are often associated with agricultural burning. Wildfires occurring in the highlands of Tibet, Sikkim, Bhutan and the northern part of Nepal at altitudes from 2,700 to 3,800m above sea level often cross national borders, especially during the dry winter fire seasons (November to January). Observations indicate that the occurrence of wildfires is increasing as a consequence of regional warming and increasingly extended dry spells. The southern slopes of the mountains are primarily affected, since they are generally warmer and drier compared to northern slopes and are therefore exposed to high human pressure. Increasing trend of wildfires in the recent past in the southern stretch of the Hindu Kush-Himalayan region are not only contributing to regional and the overall global problem, but also posing a higher risk to the communities if looked at from the point of view of the fragile Himalayan ecology.

Wildfires in high altitude Hindu Kush-Himalayas ecosystems are a major driver for destruction of pristine biodiversity, including the habitats of many rare species. During the long and intense dry seasons occurring annually in the region, wildfires are a regular phenomenon, many of them having a potential to cause major damages; e.g., serious degradation of forests, changes of ecosystem properties, and deterioration of social and economic conditions in some land-use systems and natural vegetation types.

Incidents of forest fires and total burning days are increasing in Nepal with increasing dry and hot seasons – as compared to the recent past – and the consequences of these wildfires do not only contribute to regional and the overall global problem but also posing a higher risk to the local communities, on economy, culture and ecology. The ecosystems and society are very vulnerable to wildfires, in general, and to the secondary disasters, such as landslides and flash floods, which often follow disastrous wildfires.

Forest fires are considered one of the climate-induced disasters. In 2009 alone forest fires claimed 49 lives injured 9 people. Wildfires destroyed about 146,742 hectares of forests and caused the loss of about Rs 134,415,000 (corresponding to \$US 1.5 million). A total of 9 people were reported dead, 3 people seriously injured, 431 houses were completely destroyed, and 92 animals killed. More than 82,000 hectares forests were burned in the 2010 fire season. A proper damage assessment of a fire and systematic fire management is not developed yet in Nepal. Moreover, there is no any record of impacts of fire on wildlife, medicinal plants, secondary disasters (health and water induced disasters) and, regional climate. However, there is recent new development in fire detection, monitoring and response system involving local communities.

There is increasing interest in Community-Based Fire Management (CBFiM) and the need for institutional and technological capability development at all levels in Nepal. Some key factors that urge for CBFiM are:

- Fire is used by the rural population as a traditional tool for clearing and managing agricultural and pasture lands. It is also used to facilitate the gathering of Non-Timber Forest Products and in hunting and herding. Uncontrolled fires are common in the country, with a long and intense dry season. Many of these fires have the potential to cause major damages;
- Consequences of uncontrolled fires in country, inter alia, lead serious degradation of forests, ecological changes, as well as deterioration of social and economical conditions in some land-use systems and regional climate (e.g., the Asian Brown Cloud) and natural vegetation types;

- Nepal has diverse ecosystems, socio-economic and cultural settings and vegetation types resulting from a wide range of land-use systems and climatic conditions, consequently having diverse fire regimes and vulnerabilities;
- Fire management can be an essential part in ecosystem management (not all fires are destructive);
- Sustainable management and protection of vegetation cover, which provides goods and services including non-timber forest products and recreation, maintain biological diversity, mitigates the consequences of climate change, conserves watersheds, improves air quality and helps to reduce poverty through livelihood support to rural populations.

There is a lack of existing local and national capability in fire research and management, including fire fighting, monitoring, early warning and ecological and socio-economic impact assessment, and facilitating international cooperation in fire management in Nepal.

Therefore, it has been recommended to:

- Focus on education, awareness raising and capacity building of rural populations
- Develop leadership, cooperation and communication capacities to empower local communities to take an active role in fire management
- Develop a national and regional (transboundary) policy and an implementation strategy for building / enhancing forest fire management capacities
- Establish a Regional Fire Management Center in Kathmandu
- Conduct country-level fire management training courses
 - Mid-level technicians
 - Field level technicians
 - Community level people
- Assist Nepal in capacity building in the use of information technologies, e.g.
 - Fire monitoring and early warning
 - Fire damage assessment
 - Land cover monitoring
- Disseminate of knowledge and expertise gained in CBFIM pilot projects in Nepal to a wider application inside the country and neighboring countries

Community-Based Forest Fire Management In Relation to Greenhouse Gas Emission Reduction in Indonesia

by

Prof. Dr. Bambang Hero Saharjo, Head of Forest Fire Laboratory, Division of Forest Protection, Department of Silviculture, and Dean, Faculty of Forestry, Bogor Agricultural University, West Java, Indonesia, and Chair of the Southeast Asia Wildland Fire Network

It has been scientifically demonstrated beyond reasonable doubt that fire has been part of some natural ecosystems in Indonesia for many thousands of years, and burning coal seams have been part of the landscape since that time. Today the vulnerability of Indonesian forests is mainly linked to more fundamental issues of forest management and the role of communities and local governments. There is very little attention given to the existence of local communities living close to the forests, including those that are vulnerable to fire.

Forest fires and land fires in Indonesia direct or indirectly had been well recognized as one of the main contributor to deforestation and land conversion which responsible for mostly of greenhouse gas produced which finally impact global climate change. To solve the problem, reduction of forest and land fire is a key strategic goal in Indonesia, and land conversion hopefully will minimize the negative feedbacks of global climate change to the Indonesian environment, and prevention efforts is the best solution through community involvement. The local people who live near and inside forests must be approached, giving them the best alternative solutions, so that their life style will be highly appreciated.

Historically local indigenous populations and early settlers used fire for land preparation wisely and environmentally sound, as it was inherited by the old people. These traditional practices did not have significant negative impacts to humans and the environment. Unfortunately in the end of the 20th Century the way to use fire for land preparation and forest clearing changed as the burned areas became larger and the many burned areas became connected and created vast burned, devastated landscapes. This development was depicted by satellite detection of active fires and the extent of area burned, with main fire activities in Sumatra and Kalimantan. The consequences of the fires, illegally applied without observing any clear guidelines and conducted by people who were not familiar with traditional burning like the indigenous local people. Hence, severe environmental damages occurred such as the extreme, annually recurring smoke pollution and destruction fire-sensitive rain forests a,d peatland ecosystems. These destructive and non-sustainable land-use and land-use change practices need to be banned and alternative solutions be recommended.

To solve the problem and to reduce extended ecosystem destruction and release of smoke affecting human health and the atmosphere by land preparation of local communities research was conducted in West Kalimantan and South Sumatra at different periods of time. The purpose of the research is to reduce the smoke from burning of surface fuel that dominated by shrubs, grasses, litter and left stumps. Those materials found in the surface were collected and separated into woody and non-woody materials. Woody materials are used for making charcoal and briquette, while non-woody materials are converted to organic fertilizers. Organic fertilizers return to the area that is used for planting crops, while charcoal and briquettes were used by the farmers for cooking. The research site that has 44 ton/ha of fuel load that usually burned but used as materials for making organic fertilizers, charcoal and briquette, so that no more fire used, finally found reduce greenhouse gasses as follows: 3.5 t CO₂; 0.04 t CH₄; 0.001 t NO_x; 0.04 t NH₃; 0.04 t O₃; and 0.64 t CO. These facts show that land preparation without fire is a possible solution which could be done by the community. The benefits include the production of organic fertilizers, charcoal and briquettes, and the environmentally sound reduction of greenhouse gas and particle emissions.

Community-based Fire Management in China

by

Dr. Xiaorui Tian and Dr. Lifu Shu, Research Institute of Forest Ecology, Environment and Protection
Chinese Academy of Forestry, State Forestry Administration's Key Open Laboratory of Forest
Protection, Beijing, China

Currently there are 195.4522 million hectares covered by forest in China, corresponding to a forest coverage rate of 20.36% and including a forest plantation of 61.6884 million hectares. Plantation is mainly distributed in south China, and natural forest mainly in the northeast and southwest regions. In 2010 the total population is 1.37 billion for the Chinese mainland, in which 49.68% of them living in towns and 50.32% in rural areas. In recent years, the urbanization rate of the population is more than 1% per year. It is expected that more than 300 million people would transfer from rural lands to cities during 2004-2020. Thus, forest fire management in China needs the involvement of communities.

Human fire sources are main causes for forest fires, including agricultural burning, burning paper for ancestor worship, smoking, etc. It is custom for Chinese to burn paper and fireworks for ancestor worship on the tomb-sweeping day (5 April). That day often falls in a period of high forest fire danger. But in past decade, the government advocated to use flowers for ancestor worship, and restricted open burning in wildlands. Consequently, human-caused forest fires were reduced significantly.

Laws define the units or individuals who manage forests or other forest land to take the responsibility for fire prevention. The people's government at the county level or above is required to prepare emergency plans for forest fire outbreaks and organize the town administration to make the plan. The villagers committee shall help the government to deal with forest fire in accordance with the forest fire emergency plan. Professional fire brigades are the main source for fire-fighting. The masses just do some logistics work in fire fighting operations. In forest regions, all counties have at least one professional forest fire brigade. There are a lot of rangers in the communities or villages to patrol the forest during the fire season, to respond to arising fire sources and to monitor forest fires.

The local people's government at the county level or above define the forest fire season for the local people and publish the fire danger to the public. In each fire season, the local governments sign a fire prevention agreement with the leaders of the villages and towns, including the villagers or units who manage the forest. All open burnings in wildlands are banned during the fire season.

Warning signs and fire alarm telephones are set up on the walls of villages, roads and key locations. Any unit and individual should report forest fire immediately when they detect it. In order to arouse the enthusiasm of the masses to participate in forest fire prevention and to improve the consciousness of people concerning fire safety, the fire agencies popularized forest fire prevention knowledge and self-rescue method through the radio, mobile messages, networks, slogans and other ways. The most important measure is to strictly reduce fire sources in wildlands.

Fire Management with Local communities in Bhutan: Current Practices and Future Perspective

by

Mr. Ram Bahadur Mongar, Senior Forest Ranger, Department of Forest and Park Service
Ministry of Agriculture and Forests, Bhutan

Rural people in Bhutan, about 69% of the total population, are engaged in farming, mainly subsistence farming, involving highly integrated farming system such as crops, livestock and forest components (interdependent). However, pressures are mounting on the forests to provide an increasing range of goods and services. Forest fire is one of the main causes of forest degradation in the country. The main causes of forest fire are anthropogenic.

In late 1990s the devolution of power to the community was granted. The protection of forest from fire and some of the forestry activities decentralized to the local government in accordance with the decentralization policy of the Royal Government. People's participation in the development activities was priority of the Royal Government of Bhutan and focused mainly in infrastructure development (road construction, rural water schemes, irrigation, health facility, school). Community-based natural resource management was secondary concern although government policy is to maintain 60% of forests cover of the total area. The breakthrough was with initiation of the Community Forest Program which streamlined forest fire management.

Forest fires in Reserved Forest in Bhutan, which are government-owned, are managed by state. In forests with traditional use the communities are responsible. These activities include e.g., appointment of fire watchers on a rotation basis among the villagers or collection of leaf litter and grasses. Since Buddhists believe that killing is a sin the prohibition of access for certain periods are traditional and conventional management principles practiced. A rewards system to fire-free sub-district/village is one approach encouraged. Reducing forest fires through volunteerism is also a program in the process. Volunteers have played important role, performing live theater in advocating prevention of forest fire awareness to the community of fire prone districts. Distribution of posters, erection of signboards at strategic locations, education through the media, such as of national TV and radio, are popular ways of information dissemination. Fire prevention and control messages published in both national languages (Dzongkha) and in English in the national newspaper (Kuensel) and in other print media. Back-up to combat forest fires is provided by both the local community and government.

The preparedness of forest fire is carried out by capacity building training. A manual covering the basics of forest fire fighting has been developed with the technical assistance from the New South Wales Rural Fire Service, Australia. Workshops on environmental awareness also conducted. Few basic hand tools have been distributed to some communities in fire-prone areas. Some communities seem to have fair knowledge of symbiotic relationships between humans and nature, and the goods and various services provided by the forest. There is some awareness of different forest fire regimes, firefighting tools and the concept of fire lines and fire breaks. To save forest from fire, fire lines/breaks are constructed by some communities within their community forest.

To strengthen the Community-Based Forest Fire Management (CBFiM) programme, three pilot CBFiM projects have been set up at Damkhar-Umling under Lhuntshe, Dozam Community in Monggar and Nahi in Wangdiphodrang, with financial support from Bhutan Trust Fund for Environmental Conservation (BT FEC) through the Global Trust Fund / United Nation Development Programme (GTF/UNDP). The communities have participated in prescribed burning practical exercise conducted in the research plots located within their community areas. The other partner is the Participatory Forest Management Project (SDC, Helvetas) which has a focus on forest fire management especially with the Community Forest Management Groups.

In the structure of community-level forest fire management, the head of the Administration of the local government is the chairperson and constitute of a Forest Extension Officer, a Secretary, the Head of the village concerned (small unit of sub-district), fire watchers and ultimately, at the lowest level, the community forest fire fighters. The fire watcher patrols the area and submits the report.

Challenges and issues

The rugged terrain, scattered settlements, low educational background, old traditional fire suppression methods, lack of adequate training (which has resulted in firefighter casualties), lack of projects sustainability to continuously support the activities, lack of basic tools/implements, time clashes (coinciding some agricultural activities with fire season), lack of communication facilities and firefighting resources are the constraints encountered. And the lack of immediate tangible returns discouraged people to participate,

The way forward and perspectives

While positive basic experience has been gained to involve local communities in fire management in Bhutan there is a need for more action and broadening of the approach:

- Training and application of prescribed burning should be enhanced
- Fire management programmes should be included in non-formal education, and in primary, secondary and tertiary education curriculums.
- New Forest Fire Rules (2012) are in place and should be implemented systematically
- Volunteerism to replicate experiences in other districts
- Poverty-eradication through fire management program should be fostered
- A project on monitoring of fire effects (fire severity) should be conducted in Bhutan
- A national forest fire management strategy will be developed

Bhutan has a strong legislation and a policy addressing forest fires. The communities have cultural attachment to forest since immemorial time. Despite of this fact, not much success has achieved in fire management with communities in Bhutan. Large fires continue to burn every year. Thus, the fire management challenges remains to be overcome.

Fire Management with Local communities in Mongolia: Current Practices and Future Perspective

by

Dr. Oyunsanaa Byambasuren and Prof. Dr. Johann G. Goldammer
Global Fire Monitoring Center (GFMC), Freiburg, Germany

Due to its geographical location, topography and ecological systems Mongolia is characterized by highly sensitive landscapes. Over the past 60 years, the annual average air temperature in Mongolia has increased by ~2°C. Significant changes also occurred in rainfall (17% of decrease in spring) and evaporation patterns, which are directly related to an increasing recurrence and severity of droughts and wildfires. Adverse impacts of these changes are creating a challenge for the country's economy, social life and people's livelihoods. In recent few decades due to frequent harsh climatic events (e.g. dry summers followed by extremely cold winters) many nomadic herders lost their livestock. This resulted in a concentration of population and livestock and created high pressure on natural resources in some central regions. Conversely, large areas of formerly utilized lands were abandoned.

On the other hand, the increased number and size of wildfires could also be related to the change of the political and administrative system. A wide range of government tasks, including forest fire management, has been decentralized, responsibilities are neglected and policy implementation has suffered as a consequence. Apparently, the blurred division of authority has made decision-making less transparent and also less legitimate in some localities, as compared to the state of affairs before the introduction of democratic reforms in local governance. However, fire management was always state governed.

The catastrophic fires of 1996 and 1997 brought the government's attention to the fire management situation in the country. Since that time the responsible agencies have been implemented a number of wildland fire management projects and programmes with a support of international donor organizations. However, knowledge and experience obtained during the project implementation often is not mirrored to the practice because of discontinuation of financial resources of authorities.

The new Forest Law (2011) allows the establishment of Forest User Groups or other kind of forestry "communities". In the law stated that the local communities should be the main managers of forest fire, especially in collectively owned forests. This is an important step in terms of community involvement in natural resource management including fire management. However, this development is in very early stage with many challenges ahead. The experiences from elsewhere have shown that for successful and sustainable forestry and forest fire management, continuing training and awareness raising to communities is a prerequisite.

Because of vast territory and insufficient road system the fire fighting organization units are often not able to rapidly reach remote areas. The remote local communities are causing the most fire cases and also they are affected by the fires. Therefore, the application of Community-Based Fire Management principles will continue to be an important approach in fire management. Recent pilot projects on fire management show that since local communities owned the forest areas the number of fire incidents have decreased. Communities act more responsibly as compared to the time when forests were owned by the state.

The country needs to reconsider achievements from fire management consultations and further design and develop community-based forest fire management plan and including precise regulations, organize practical demonstrations and training on the targeted area and targeted local communities, that will govern and spell out roles and responsibilities of each key player (Forestry User Groups, Local Government, Provincial Emergency Management Departments, State Emergency Management Agency and the Forest Department) and other relevant stakeholders in preventing and combating fire incidences and their consequences.

In 2008 the Global Fire Monitoring Center (GFMC), financially sponsored by the German Agency for International Cooperation (GIZ), worked with the Forest Agency (now Forest Department within the

Ministry for Environment and Green Development) and the National Emergency Management Agency (NEMA) to set up an inter-agency and cross-sectoral dialogue for developing a future fire management system for Mongolia. During the First International Central Asian Wildland Fire Joint Conference and Consultation "Wildland Fires in Natural Ecosystems of the Central Asian Region: Ecology and Management Implications", associated with the First Central Asian Forest Fire Experiment, representatives of local communities (Mandal soum, Selenge aimag) participated. They demonstrated that taking ownership of forest use results in great awareness and action to protect the forests against illegal logging and wildfires.

After the establishment of a "National Council for Regulating Activities on Prevention of Forest and Steppe Fires" a "Sustainable Forest Fire Management Activity Plan" was developed in 2009 which called for the „improvement of the participation of NGOs and residents“ in fire management. With the administrative and political reforms in Mongolia in 2012 this approach of community involvement will be actively developed.

The establishment of the Central Asia Fire Monitoring Center, an currently ongoing activity of the UNISDR Regional Central Asia Wildland Fire Network, aims to share information, knowledge, and expertise in the development of participatory approaches in fire management with the neighbor countries China, Kazakhstan and the Russian Federation. Furthermore partnerships are envisaged with the UNISDR Regional South Asia Wildland Fire Network and the Pan-Asia Wildland Fire Network Cluster. The proposal to set up a Regional South Asia Fire Monitoring Center in Nepal offers the opportunity to establish partnership between the two regional centers and networks.

Fire Management with Local Communities in Russia: Current Practices and Future Perspectives

by

Dr. Andrey V. Kalinin, Chief, Aerial Forest Fire Center "Avialesookhrana"
Mr. Andrey M. Eritsov, Deputy Chief, Aerial Forest Fire Center "Avialesookhrana"
Pushkino, Russia
Prof. Dr. Johann G. Goldammer, Director, Global Fire Monitoring Center (GFMC)
Freiburg, Germany

The global ecological value of forest of Russia, its huge economic and social potential role obliges the Russian Federation to have a long-term advanced forest policy in place, in which principles and the main directions of the development of the Forest Sector is defined in the interests of current and future generations of Russia. The forest policy is implemented by the state and needs to have a high level of acceptance by civil society,

Among many different problems in the forest sector during the last few years wildfires affecting protected (managed) forests and other lands, e.g. natural peatlands, natural pastures and agricultural lands, have resulted in high economic and environmental damages. The most recent extreme fire season occurred in 2010, the most severe season since the major fire episodes in 1972, 1987 and 2003. Forest fires and fires burning on managed and abandoned agricultural lands run out of control in 19 regions of Russian Federation, affected many villages and destroyed over 3,000 homes and infrastructures. A total of 62 people – both firefighters and civilians – were killed by wildfires. In all that regions local communities tried to save their homes, assist fire fighters before the disaster came to the villages, but they were not well prepared and trained. Villagers did not have any safety clothes, hand tools and equipment. However there were some regions where volunteers took active part in fighting wildfires.

There are huge problems in the last decades in the villages of Russia. Because of agriculture activity and farming business collapsed tens of thousands villages have been abandoned. Some of these areas are now used as recreational places, e.g. weekend and summer houses. In the forests near settlements and on the abandoned agricultural fields succession is taking place, and the abandonment of land and forest use is resulting in the accumulation of large amounts of fuels and thus an increased wildfire disaster hazard. While most of the young local work force is migrating to towns and cities, there are only a few people staying in the villages and still use traditional methods to clean their lots they used for grazing, hay fields and hunting areas. Following the instructions at Federal level in Yakutia region a regional law was enacted in 2011 to restrict agricultural burnings since many of these fires spread to forests. However, in many remote areas people still were not informed about fire use restrictions and continued uncontrolled burnings.

In the forest sector there is traditional use of prescribed burning as well, but these operations are very limited. There is still a lack of legal documents to regulate prescribed burning operations. Therefore a comprehensive approach is required to protect villages and forests from uncontrolled and destructive fires and to involve local citizens and municipalities in this activity.

Between 3 and 8 September 2012 the „International Fire Management Week“ was organized under the joint umbrella of the Federal Forestry Agency ROSLEZKHOZ of Russia and the Global Fire Monitoring Center (GFMC), both cooperating partners under the bilateral Russian-German Agreement on Cooperation in Sustainable Forest Management, and under the framework of the UN International Strategy for Disaster Reduction (UNISDR) and the UN Economic Commission for Europe (UNECE).

During this event the latest and up-to-date state of the art of fire ecology and advanced fire management methods on the use of prescribed fire for wildfire hazard reduction in temperate-boreal Eurasia were presented and discussed between scientists, practitioners and policy makers at national level of the Russian Federation, and with representatives of the administrations of Krasnoyarsk Krai.

In a seminar basic statements and papers were presented on the role of fire in ecosystems and the implications on fire management.

At a field demonstration on prescribed burning under canopy of a pine stand nearby Krasnoyarsk media representatives were briefed about the objectives of prescribed sub-canopy burning in pine forests. Attendees of this demonstration witnessed for the first time that a prescribed low-intensity surface fire can be set in a forest to safely reduce surface fuels without damaging the stand.

An expedition to the site of Bor Forest Island Fire Experiment of 1993, located between the settlements Yartsevo and Bor, demonstrated the concept of a long-time research project of the consequences of a severe, high-intensity fire. The experiment, scheduled for the 200-years research period 1992-2192, investigates the consequences of a high-intensity forest fire, followed by secondary pests, on the regeneration of a natural forest.

A Round Table on the 4th day of the International Fire Management Week evaluated the seminar, the prescribed burning experiment and the visit of the Bor Forest Island Fire Experiment.

The Round Table concluded that there is an urgent need to revise the policy and practice of fire management in the Russian Federation, and agreed 10 recommendations including:

- Legal and other normative documents that are regulating forest management and forest fire protection need to be complemented concerning the use of prescribed fires and prophylactic burning under forest canopy.
- Methodological guidelines for prescribed burning under forest canopy need to be developed at federal level.
- Educational programs for the training of forest firefighters and fire management specialists at different educational levels (including programs for volunteer fire fighters) need to be developed and approved at Federal level.
- Programs of advanced continuous professional education for foresters on prescribed burning need to be developed and approved
- Further scientific research concerning prescribed fires needs to be supported at Federal level.
- The Order of the Federal Forestry Agency № 174 of 27 April 2012 "Approval of the normative for forest fire management plans" need to be changed in the section on planning the prophylactic burnings at forest district level and to determine the normatives for fire prevention operation plans in the 1-km zone around settlements.
- Concepts for the use of fire on agricultural and other non-forested lands of the Russian Federation need to be developed.
- A new system of statistical accounting and classification of types of forest and other vegetation fires and their consequences needs to be developed and appropriate changes to be made in the GOST № 17.6.1.01-83 (approved by Decree of the State Committee on Standards, 19 December 1983).
- International expertise in the field of fire management needs to be used, including the system of statistical accounting and classification of vegetation fires proposed by GFMC.

It was obvious after fire season 2010 that it is necessary to develop guidelines, rules and regulations to involve voluntary citizens and local people for defending villages against wildfires. Subsequently by the Government of Russia passed Federal Law No. 100-FZ (6 May 2011) on "Voluntary Fire Brigades for the Prevention and Suppression of Forest Fires".

The creation of Voluntary Fire Brigades three main steps need to be taken:

- Setting up organizational procedures on creation of voluntary units to be actively involved in the prevention and suppression of wildfires;
- Development of a draft charter (a legal document); and
- Registration at the State to become a legal entity.

"Voluntary Fire Brigades for the Prevention and Suppression of Forest Fires" can be created at the initiative of citizens and any public association. A Public Association is understood as a voluntary, non-commercial association created by an initiative of citizens. A Charter needs to be developed,

which defines the interests and common goals of the community and the procedures for the realization these goals as specified in the Charter.

Founders of public associations can be individuals and legal entities. The Public Association has to call for a convention (congress) at which the charter of the Public Association is presented and approved. Founders of Public Associations – Individuals and legal entities – have equal rights and perform equal duties. Federal and Regional Government monitor the rights and legitimate interests of public associations, support their activities and regulate grants and other privileges by legal acts.

Regulations to become a member of a Voluntary Fire Brigade require physical fitness of applicants. Every member of a brigade has a contract with the brigade about insurance and other regulations.

The activities of voluntary fire brigades include:

- Monitoring of the Forest Fund (patrolling)
- Organization of meetings with local people and providing fire propaganda for awareness rising and public information and education
- Participation in prevention and preparedness operations (building fire lines, access routes, water sources, distribution of fire propaganda booklets, construction of informative billboards, etc.)
- Participation in fire suppression operations
- Participation in the evacuation of local people
- Participation in rehabilitation operations

According to that Federal law voluntary fire brigades are allowed to take part in fire suppression operations without having a special license if the members of the brigades have successfully passed training classes and physical fitness tests.

According to the labor legislation it is permitted for men in the age between 18 to 60 years and for women from 18 to 55 years (except pregnant and feeding women) to perform this work if they do not have any physical defects and have passed a medical examination and are in a state of health that is recognized suitable to allow the performance of this work. Women, as a rule, perform auxiliary works (consumer services, cooking, paper works, etc.). These requirements concern for professionals as well, i.e. professional working in fire brigades or aerial fire fighting organizations.

Fire fighting operations in large fires by Voluntary Fire Brigades take place under the command and control of forest fire fighting organizations, such as fire chemical stations and/or aerial fire fighting forces. The Public Associations which are the organizers of the Voluntary Fire Brigades provide all organizational support, including training, safety clothes, fire trucks, equipment. However, during fire fighting operations the forest service authorities provide transportation, food and water supply, and observe all safety requirements.

The normal duration of working hours shall not exceed 40 hours per week. However, during the suppression of forest fires, especially when the return of volunteers to a residence is impossible for some time because of the remoteness of a scene of action on a fire, the operating mode is established by the head of fire suppression operations. The allowable operating time should not exceed 10-12 hours per day, and all working hours spent during firefighting will be noted. According to the regulations the volunteers will be compensated after the completion of fire fighting operations. The amount of accumulated work hours during firefighting operations will entitle the volunteer to be awarded days off or work time reduction in their main profession after returning home. At present the Aerial Forest Fire Center jointly with the Greenpeace of Russia is developing Guidelines for Voluntary Fire Fighters that will be published and recommended for training and fire fighting.

The Global Fire Monitoring Center in cooperation with the All Russian Institute of Continuous Education in Forestry translated advanced training materials from English to Russian that will be distributed to train Voluntary Fire Brigades and Municipality Authorities.

The Aerial Forest Fire Center, All Russian Institute of Continuous Education in Forestry on behalf of Federal Forest Agency supported by the Global Fire Monitoring Center (GFMC) and in cooperation

with the U.S. Forest Service are planning to organize in 2013 educational international seminars on Village Defense against Forest Fires.

The implementation and success of building Voluntary Fire Brigades is in the responsibility of the regional authorities of the Russian Federation. There are some regions such as Altai Region, Primorski Krai, where Regional and Public Authorities set up special programs. Some projects have been supported by grants of international organizations.

Information Communication Technology onto the CBFIM

by

Dr. Byungdoo Lee, Division of Forest Disaster Management
Korea Forest Research Institute, Seoul, Republic of Korea

It is estimated that 80% of fires globally burning in forested areas, stem from escaped agricultural fires. It is therefore more important to educate and train local residents for reducing unwanted fires than to establish the expensive fire suppression resources relatively. The participation of local people is the prerequisite of successful fire management. In this aspect, Community Based Fire Management (CBFIM) is the proper and unique solution. In the CBFIM, the accurate and timely information communication between local community and the authorities of forest fire management is important. The system based on Information Communication Technology (ICT) plays a major role in fire information sharing.

Korea is running several fire information systems. For example, the National Forest Fire Danger Rating Index System, the Forest Fire Behavior Prediction System, the Fire Ignition Point Reporting System, and the Aerial Suppression Resource Flight Path Tracing System are elements of the comprehensive National Fire Information System.

1. To strengthen the fire information delivery system to the local residents

If the fire danger index is high in certain areas, a warning message from the fire danger rating index system is transferred, automatically, to a head of a village who will notify the people of fire danger. He also informs the villagers that some acts are prohibited, such as waste burning or setting camp fires near mountain areas.

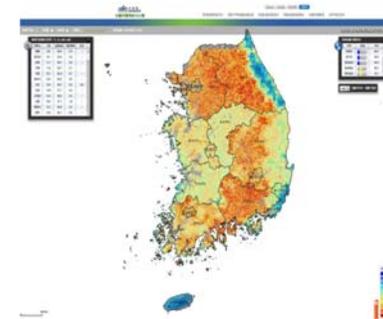


Figure 1. National forest fire danger rating system

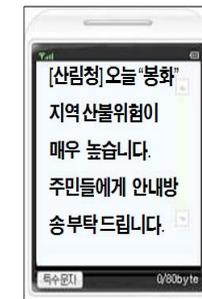


Figure 2. Forest fire danger index message to the head of a village

2. The participation of local people in the prevention and suppression fire

The local people are employed as firefighters. 25,000 local residents are taking part in the activities of fire prevention and initial suppression across the nation. The fire ignition reporting assistant is provided to these people for the accurate and quick reporting from field to fire control headquarters. Also the application of smart-phone for ignition reporting has been developed.

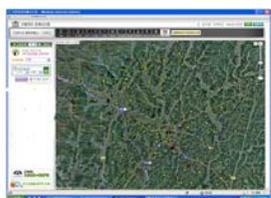


Figure 3. Forest fire prevention by a local resident.



Figure 4. Smart-phone application for fire reporting.



3. Fire information sharing using web-site

Information on restricted mountain areas and trail closures is serviced by the Korea Forest Service website. Local people are employed to patrol these areas.

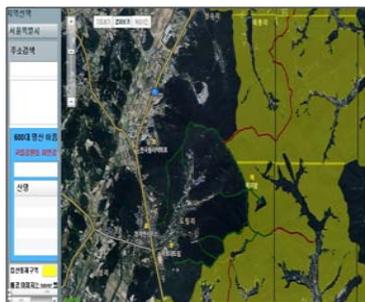


Figure 5. Web-based service of trail closure and restricted mountain area for fire prevention.



Figure 6. Forest fire database

Community-based Fire Management: Strategies and implementation in Ghana

by

Mr. David Asare, Resource Management Support Centre
Forestry Commission of Ghana, Kumasi, Ghana
Focal Point, Regional Sub-Sahara Wildland Fire Network (AfrifireNet), West African Sub-region

The global environment has over the years been under threat as a result of identifiable environmental problems militating against the sustainable management and development of the environment. Key amongst these environmental problems is wildland fire. Wildland fires have assumed an increasingly destructive dimension on the global environment that nations across the world are making frantic efforts at addressing the situation.

As one of Africa's fastest developing resource rich nations, Ghana has made crucial efforts towards improving the socioeconomic conditions of its people. In particular, the forest sector of the economy is widely recognized as having the most significant potential to impact Ghana's economic growth and development in the foreseeable future.

This potential is seriously threatened due to a dramatic increase in the number and severity of wildfires experienced in the country. Fire is perhaps the most important single threat to the integrity of forests in Ghana. In recent years, Ghana has lost an ever-increasing percentage of its gross domestic product to the indiscriminate ravages of fire.

Wildfires are also the direct cause of irreversible environmental damages in Ghana. In certain areas of the country the process of desertification has been hastened due to fires which have permanently destroyed delicate but vital organic soil material. At present, most fire-affected areas show progressive degradation. The loss of forest cover in the country has seriously affected local communities by its effects on local hydrology and the loss of a wide range of non-timber forest products. A comprehensive fire management programme especially at the community level is needed to change the balance from a degrading to an aggrading system. Effective management of fire within forest fringe communities will allow forest rehabilitation and enhance the livelihoods of people living in these areas.

The Wildfire Management Project made significant progress under the six components through strategies and interventions rolled out to curb the unpleasant effect of wildland fires on some fringe forest communities in Ghana. It implemented a comprehensive public awareness campaign and developed effective communication systems for fire detection and suppression as well as the identification and validation of 19 weather posts and stations. It further established 34 Wildfire Clubs in second cycle institutions across the country.

A National Wildfire Management Policy was developed with government approval and disseminated throughout the implementing areas within the country.

Training manuals were also developed for fire volunteer training and a total of 9,982 members of Fire Volunteer Squads trained. A Wildfire Management Manual has been developed and serves as a training manual for resource managers in Ghana.

A total of 616 km of green firebreaks was established in 28 forest reserves thereby creating employment for target communities and enhancing poverty alleviation within such communities. Incidences of wildfire had tremendously reduced in the project coverage areas as a result of the wildfire management interventions and efforts are being made to consolidate the gains.

Currently, the Wildfire Management Project has dovetailed into the Natural Resources and Environmental Governance Programme (NREG) with a view of further strengthening interagency support and collaboration as well as extending the success story of the wildfire management strategies to other parts of the country.

**People's Participation in Forest Fire Management
Thailand's Experiences**

by

Mr. Siri Akaakara, Forest Protection and Fire Control Expert
Department of National Parks, Wildlife and Plant Conservation, Thailand

In Thailand, all forest fires are caused by human activities. This was widely known long before the establishment of the Fire Control Agency of Thailand back in 1980. It was later backed up by the official fire statistics. Due to this fact, the first priority of fire control activities is to work with people to prevent setting fire. Since without people's cooperation, fire prevention is a mission impossible, therefore people's participation is the only key to success.

Within these last three decades, Thailand has introduced and practiced various models and approaches of people's participation in fire management with the different degrees of success and failures from each approach. All models practiced are as follows:

- "Village Fire Volunteer Brigade" where the government provides training and equipment to villagers in fire-prone areas and expecting them to take care of fire in their respective area.
- "NGOs Village Fire Volunteer Brigade" This model is run by NGOs either international or local. It is the same as the 1st model, only NGOs pay salary to volunteers for full time participation.
- "The Reward for Smoke-free Village" The government ask villagers to prevent fire in forests in adjacent to their villages. If there is no fire throughout fire season, they will be rewarded with money for communities usages.
- "Decentralizing Fire Management Task to Local Administration Organization" This is done under "Decentralization to Local Administration Organization Law 1999" The law mandates the transfer of fire management task in all National Forest Reserve to Local Administration Organizations.
- "Self-Established Fire Management in Communities Forests" The government promotes local communities to manage communities forests within National Forest Reserve. The locals have to protect and rehabilitate their communities forests. In return they directly benefit from collecting all kinds of non-timber products. Also they enjoy better water supply from forests they protect. Moreover they earn more income from home stay and eco-tourism.

Due to the poverty in rural areas, local people will participate in fire management only when they have financial incentives or other direct benefit.

**Closing Remarks
22 November 2012**

by

Dr. Sim Heok-Choh
Secretariat, Asia Pacific Association of Forestry Research Institutions (APAFRI)

Thank you very much for the invitation to say a few words during the closing of this very important meeting on forest fire management. I would like to, again, apologize on behalf of the Chair of APAFRI, Dr. Abd Latif Mohmod, who is also the Director General of Forest Research Institute Malaysia (FRIM), for unable to be with us here for this consultative meeting due to other pressing matters.

Allow me to congratulate the Organizers for the very successful and fruitful meeting, including the very tiring, yet exciting, field trip to a rather remote pine plantation up in the mountains. I personally had learned a great deal about community involvement in forest fire management, and was taken aback by the extremely committed local community in voluntarily managing the pine plantation, including fire management.

I would also like to express my special thanks to Mr. Sundar Sharma, for the invitation to this meeting, which among others, gave me the rare and much treasured opportunity to rekindle my linkage with many Nepali colleagues, some whom I have not met for many years.

The Honorable Minister, for your information, your Department of Forestry Research and Survey has been an active member of APAFRI since 1997, and many of your staff members had actively involved in APAFRI activities over all these years. We hope to continue this cordial relationship and close collaboration, contributing to capacity building, not just at the national level, but also at the regional level.

Thank you very much, and I wish all a good farewell and safe journey home.

**Closing Statement
22 November 2012**

by

Chief Guest, Mr. Yadu Bansh Jha, Honorable Minister
Ministry of Forests and Soil Conservation, Government of Nepal

It gives me an immense pleasure to be here on the occasion of the closing of this 'Consultative Meeting' in the Pan-Asia region, organized by Department of Forests. It is my honor to have the opportunity to welcome you all to this discussion programme.

By appreciating the concern of 'Forest Fires in Mountain Ecosystem in Nepal' by the Secretary General of the United Nations, Mr. Ban Ki-moon in his opening speech of the Fifth International Wildland Fire Conference in South Africa in 2011 and his expression of emphasis on "Community-based Fire Management", I would like to elaborate our local situation and our efforts so far.

The Government of Nepal has made appropriate decisions in the last two decades to preserve the forest resources of Nepal by encouraging forest users in managing forests. Credit goes to the efforts of millions of forest users, who have successfully taken roles to protect and manage our forests. These forests were once degraded extensively causing adverse impacts to the livelihood of the people as well as the mountain environment.

These efforts have enabled us to address the human induced pressure on forest. Today we feel proud to have improved forest cover as well as its productivity.

However, we are not without problems. Forest fire has been a prolonged problem in forest management in Nepal. The denser the forests, the higher are the fire risks. As a developing country, Nepal does not have the resources to afford to maintain a fleet of equipments and trained fire fighters to go out to the mountains and attend the fire hazards. Moreover, the dry period of February to May is also the hottest months in Nepal. The rivers flow at their minimum. Springs and wells dry out. When fire breaks out, it only stops after all the fuel in the forest have even burnt and that only happens when the fire reaches the mountain tops.

Forest fire is not only a serious hazard to forests, but are also damaging community homes and injuring and killing humans. We need to find the ways and means to address this issue. First of all, we need to understand what fire hazard means to our forest resources, our economy and to our overall environment. When we understand these, then we need to develop strategy to address the issue. The ways identified must be suitable to our situation and affordable to the people. It also must be effective so that our action can be faster than the rate at which forest fire spread across.

Finally, your deliberations during these three days have come up with fruitful results and recommendations for enhancing regional cooperation fighting against forest fire. I assure you that the Government of Nepal will join you to address this crucial issue of forest fires through regional cooperation.

I thank all the organizers and participants. I wish you all very good evening and happy stay in Godawari.

Thank you.

**Vote of Thanks
22 November 2012**

by

Mr. Yam Bahadur Thapa, Head, National Organizing Committee
Deputy Director General, Department of Forests, Ministry of Forests and Soil Conservation
Government of Nepal

On behalf of the Department of Forests, on behalf of the conveners and on my own behalf, I would like to thank you all to bring this 'Regional Pan-Asia / Pacific Consultation: Building Advanced National and Regional Capacities in Integrated Fire Management based on Participatory Involvement of Local Communities' to a successful end.

Its our great pleasure that the our honorable Minister of Forests and Soil Conservation is with us despite his busy schedule to give this event a high value. I warmly welcome him this meeting and heartily thanks for his presence.

Similarly, our respected Secretary of the Ministry of Forests and Soil Conservation guided us from the inception of the meeting to date. I thank him for his close guidance through this meeting.

Most importantly, I would like to thank Professor Johann Goldammer from he Global Fire Monitoring Center (GFMC) for his continuous support not only for Nepal but also to the global arena. Thank you also, Professor, for your valuable time given to this meeting. We further hope to receive similar support in future, too.

And, I would like to thank Korea Forest Research Institute (KFRI) for the funding support to this consultative meeting. I further thank Dr. Gil Bon Koo, Director General of the Korea Forest Research Institute, for the opening remarks, and I thank Dr. Koo and Dr. Lee for their continuous support in preparation to this meeting.

I thank the Asia Pacific Association of Forestry Research Institutions (APAFRI) for financial arrangement for this meeting. I personally thank to the Executive Secretary Dr. SIM Heok-Choh and his valuable contribution to the meeting.

Apart from the Department of Forests, I would also like to thank Regional South Asia Wildland Fire Network, the Nepal Forest Fire Management Chapter and the Global Fire Monitoring Center to convene and generously support this meeting.

The contributions from all the delegates from Nepal and abroad are highly valued and appreciated. I thank you all for your valuable deliberations.

I am really delighted to mention the works of the members of the 'National Organizing Committee' for their hard works to make this meeting a grand success. Please give a 'big hand' for Mr Pashupati Koirala, Mr. Sundar Sharma, Mr. Anuj Raj Sharma and Mr. Ajeet Karna.

Last but not the least, I thank to the friends from media for your positive comments and to hotel management for excellent logistic arrangement.

At last, I once again thank you all and wish for a safe return back home.

Thank you.

Lesson Learnt from Community Based Fire Management (CBFiM) Implementation in East Kalimantan

Special paper prepared by

Edy Marbyanto, Hartmut M. Abberger and Helmut Dotzauer¹

History

The total area of East Kalimantan Province – Indonesia is 19.84 million hectares. Forest area in East Kalimantan amounts to 14.65 million hectares or around 70% of the total area of the province. Total population in East Kalimantan is about 3.56 million people (2010). The population is very heterogeneous because East Kalimantan has several indigenous people ethnic groups (such as Dayak, Banjar, Kutai etc) and also migrants (Javanese, Buginese, Sundanese etc). The indigenous people have a long history of fire management, especially by using slash-and-burn techniques for shifting cultivation. Forest and land fires are an especially difficult problem in East Kalimantan because of the vast peat forests and coal layers providing huge amounts of fuel for forest and underground fires.

Since the early 1980s, almost every three to four years, the El Niño phenomenon occurs causing droughts and providing prime conditions for extended wildfires in East Kalimantan Province, Indonesia. The most severe events in recent history occurred in 1997/98, when wildfires burnt 5.2 million hectares of forests and other land vegetation causing huge damages to man and nature. Most ignitions resulted from forest conversion activities for industrial plantations and from escaped small-scale agricultural fires. Fire management capacities were limited and couldn't cope with the extreme situation.

Between 1994 and 2004 the Indonesian government was supported by the German government (cq. GTZ) through the Integrated Forest Fire Management Project (IFFM) developing a forest fire management system for the Province of East Kalimantan. Part of the concept was to cooperate with local communities. IFFM designed a concept to establish a Community Based Fire Management System (CBFiM) in East Kalimantan. The programme covered all relevant aspects of fire management in the framework of community development and was aimed at community-driven participation to avoid and suppress wildfires. The CBFiM concept developed consists of the following modules:

- Capacity and risks assessment and village selection
- Village prevention campaigns and extension work
- The building-up of village fire crews
- Fire management training
- The provision of hand tools
- Institutional strengthening of a village fire management system
- The drafting of village fire regulations
- Yearly planning for fire management
- The establishment of a fire management network.

The most important aspect, in the course of developing CBFiM, was setting up of village fire crews and subsequently providing training for the crews. Once established, village fire crews had to define their objectives and elaborate Standard Operating Procedures (SOP), job descriptions, products and services. The module of drafting village fire management regulations was designed to determine all fire relevant aspects important to a community – and therefore also regulating the framework for the use of fire as a tool for field preparations. In addition, village regulations potentially strengthen the position of village fire crews within their communities. This is critical for giving fire management some

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importance in villages and subsequently increasing the motivation and participation of people as members of fire crews.

Fire information aspects such as readiness levels (alert levels), seasonal calendars, weather forecasts (early warning aspect) together with the determination of response areas are important to define strategies and resources needed for CBFiM.

Networking with other village fire crews, the government, and also with forest concessions and plantation companies is necessary in order to share resources and increase capacities in fire prevention, preparedness, response to fires and rehabilitation efforts. Therefore communication strategies needed to be set up. In rural areas, the use of modern communication technologies might still somehow be limited. However, tools such as hand phones are very efficient and can be found already in many villages.

After the IFFM project was closed in 2004, the Provincial Fire Management Center took over and is continuing forest fire management in East Kalimantan.

Table 1. Number of villages with fire crews in East Kalimantan

District	Number of villages in district	Villages which fire management training	Number of fire crews	Number of personnel
Pasir	110	15	27	270
Kukar	195	26	33	330
Tarakan	18	10	10	100
Balikpapan	27	2	10	100
Kutai Timur	115	15	19	190
Bontang	14	6	6	60
Bulungan	85	11	11	110
Kutai Barat	209	20	20	200
Berau	85	15	15	165
Samarinda	42	3	8	80
Malinau	135	13	15	150
Nunukan	216	6	8	80
PPU	46	5	5	50
Total	1,307	147	187	1,885

Lesson Learnt from CBFiM Implementation

From the implementation of CBFiM in East Kalimantan, the following lessons learned have been identified:

1. CBFiM is a Capacity Building Process

Moore described CBFiM as "an approach to the management of fire in the landscape that adequately includes communities in decision making about the role, application and control of fire." Participation in decision making processes is the highest level of participation, other types of participation are: participation in providing inputs to or for proposals fire management, participation in meetings and providing information, participation which raised from a persuasive approach or campaigns, participation which raised from incentives (Arner, 1997). From our field activities, we got the experience that community participation very often started from a low level of participation such as participation which was caused by using incentive systems or a persuasive approach. If they got benefits (economic, ecological or social ones) from their participation usually participation increased. To improve community participation, capacity building efforts, such as training, extension activities, trust building measures (e.g. through community meetings) and campaigns were needed. Capacity Building efforts have to be conducted continuously until local communities are able to manage a CBFiM system by themselves.

2. Right and Benefit for community

A lot of communities living in or close to forests are poor people. They will participate in CBFiM if they get benefit from their effort, especially economic benefits. It is easier to encourage the local communities to develop and apply a CBFiM system on their own land than on state owned forests. On their own land CBFiM will help local communities to protect their economic assets. But on state forests such as National park or production forest which are managed by forest concessionaries, sometimes it is difficult to invite local community to get involved in forest fire management because they will not get direct economic benefits. CBFiM will be easier to be implemented if local communities have access and rights to manage the forest resources in the proximity of the villages. A partnership with equal rights between communities, government institutions and/or the private sector need to be developed because local communities are the main actor of CBFiM and not its object.

3. Respect local knowledge and local resources and integrate with "modern" technology.

East Kalimantan has a population of about 3.56 million people with a mix of indigenous people (such as Dayak ethnics, Banjar ethnics, Kutai ethnics) and migrants (such as Javanese, Balinese, Sundanese, Buginese, etc.). Indigenous people usually use slash and burnt techniques for their shifting cultivation activities. Indigenous people have traditional knowledge on fire management (and they have several traditional hand tools too). Therefore it is easier to introduce CBFiM by using their traditional knowledge and their local institutions as a base to develop CBFiM than using "outsider" knowledge. However, sometimes modern knowledge and technology need to be introduced in order to be more effective and efficient such as using modern hand tools, early warning system using hotspot monitoring etc.. Deforestation and forest degradation has changed the environmental conditions. Open forest canopies change the micro climate of forest stands and therefore influencing factors such as humidity, fuel amount etc.. These altered conditions also need an adaptation of local knowledge to the changed situation and long used, traditional techniques might become harmful under these much more drier and fire prone conditions. For example in the 1970s it was safe if local community built a fire break of one to two meters, but now, under much drier conditions, fire brakes need to be much wider to prevent fires to get out of control when they prepare their land for the next agricultural season.

4. Local specific and not uniformity approach.

Communities in East Kalimantan are heterogeneous. They have different knowledge, resources, institutional arrangement etc. It needs a local specific approach taking into account local conditions and not an uniform approach. It is not only the differences between indigenous people vs. migrants, but in some cases within the same ethnic groups they have different knowledge and approaches because they live and work under different environmental conditions.

5. Integrating CBFiM with Sustainable Livelihood

Many local communities have traditional/indigenous knowledge on fire management. However, they need support from other stakeholders to improve or modify their knowledge and traditional fire management systems in order to adapt to the changed environment they are now living in. Support is also needed to develop sustainable livelihood system and establish income generating programmes. A multi-stakeholder and multi disciplinary approach is needed to support CBFiM implementation at the local level.

Challenges

1. Fire management policy is not suitable with local situation.

Indonesia already declared its commitment to reduce carbon emission. As a consequence of that Indonesia is applying a zero burning policy. This policy will not render results and have any positive impact on the local situations because many indigenous people still practice slash and burnt technology and the government does not offer alternative (non burn) technologies and incentives that are not involving burning practices, which can be offered instead to local communities.

2. Limited legal access for local communities to manage the forest.

East Kalimantan has still a very large part of its land covered with forests. However, the biggest part of the forests are managed by the government (such as National Parks and Protected Forests) or by forest concessionaires (production forests). It will be difficult to encourage local communities to get

involved in fire management if they still do not benefit from the forests surrounding their villages and in their opinion belonging to them anyway. To support CBFiM the government must change its paradigm applying gradually a policy of "community based forest management" instead of "large scale and capital based forest management" as well as changing from "timber management" to "forest ecosystem management".

3. Lack of coordination among stakeholders

CBFiM needs a multi-disciplinary and multi-stakeholder approach. But right now only the Forestry Service or the Environmental Service tackle this issues. Sharing of resources and responsibilities among stakeholders and community empowerment in general and for CBFiM is still very limited.

4. Lack capacity of Human Resources

The development of CBFiM requires intensive support from the Forestry Service and other governmental institutions. So far very often no personnel of the Forestry Service or other institutions is assigned to cooperate routinely and regularly with local communities at the province and district level of East Kalimantan. However, this is a critical issue for the success of CBFiM-DP. Other issues are that available personnel sometimes does not have enough knowledge and skills on social and participatory approaches. Consequence is they tend to use a top down approach when they work with the communities instead a bottom up approach and very regularly fail to achieve anything at all. Personnel working with and for communities have to be trained in applying participatory methods in workshops and other events and need a good knowledge and skills in the design and implementation of trainings (visualization methods and didactics).

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Community-Based Fire Management in China

Special paper prepared by

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1. Introduction

China has 282.8 million hectares (ha) of forest land, in which the state forest accounts for 40%, and collective forest for 60%. Total forest area is 174.9 million ha, in which the state forest accounted for 42.5%, and collectively forest 57.5%. The forest are mainly distributed in the northeast forest region, southwest high mountain area, southeast hilly forest region, northwest high mountain region and tropical regions. Most forest distribution concentrates in the main river basin and in the mountain-hilly areas. In the geographical distribution, there are more forest in the outlying provinces in Northeast and Southeast China, and hilly lands of Southern China, while less forest in the vast northwest area, central Inner Mongolia, most of Tibet, as well as densely developed economy regions of north China, the Yangtze River range, the lower reaches of the Yellow River.

The state managed forest areas comprise about 41.33 million ha, which accounted for total forest land 15.5%, and stumpage volume 25.8%. Southern collective forest regions include Hainan, Guangdong, Guangxi, Fujian, Zhejiang, Anhui, Jiangxi, Hubei, Hunan and Guizhou and parts of Sichuan Province, with area of 151.2 million ha, 15.75% of the national land area. In the region, collective forest occupies more than 90% of the total, and its ownership belongs to farmer, collective and enterprise, in which farmer are main body.

In 2010, the total population is 1.37 billion in China mainland, in which 49.68% of the populations live in towns or cities, and 50.32% in the countryside. According to the statistics, in 2004 there were 9.43 years educations in urban, and 7 years for people in countryside. Urban illiteracy rate was 4.91%, and 10.71% in the village. The population aged 0-14 years accounted for 21.50%, and aged 15-64 years 70.92%. In recent years, the population urbanization rate is more than 1% annually. It is expected that there about 300 million people would transfer from the countryside to cities during 2004-2020.

During 1950-2011 the average annual forest fires is 12,810 in China, in which 4630, 3614, 28 and 4 fires in size <1, 1-100, 101-1000, and >1000 ha respectively. Average annual 613,645 ha forest were burned. In 1989-2011 there were 7415 forest fires in annual, in which 4197, 3198, 18 and 3 fires in size <1, 1-100, 101-1000, and >1000 ha respectively. The annual burned area was 260,580 ha for the period, of which 85,674 ha were covered by forest (41,135 ha natural forest and 29,477 ha plantations).

2. China's forest fire management organization

"Forest Fire Prevention Ordinance" stipulates that the forest fire prevention implement administrative leadership responsibility system of the people's governments at all levels, and the people's governments at all levels should put forest fire prevention as an important task. The work need to be under the unified leadership and take comprehensive measures. The local people's governments set up forest fire management headquarters, and the principal leaders of the Government or the competent leadership take as commander. The leaders from the relevant departments or local military take the deputy commander or headquarter members. Forest fire management headquarters take the responsible for forest fire management in the administration. The county government should organize the town government to develop the forest fire emergency response approach based on the forest fire management plan. Village committee should help to deal with emergencies in accordance with the provisions of the forest fire emergency plan and forest fires approach.

The units and individuals of ownership for forests, trees or woodlands should establish forest fire prevention responsibility system, delineate of forest fire area of responsibility, and design a

responsible person for forest fire prevention in accordance with the provisions of the competent forestry departments. They also need to prepare forest fire prevention facilities and equipment. The Local people's governments and state-owned forestry enterprises, institutions should establish the professional fire brigades based on actual needs. local people's governments at county level or above should guide forest management units and villagers' committees, businesses and institutions in forest regions to establish volunteer brigades (masses forest fire fighting team). Professional and volunteer brigades should conduct regular training and drills. The part-time or full-time rangers from the ownership of woodland are responsible for patrol forest, manage and report the fire in wild, and assist the relevant authorities to investigate forest fire cases.

By the end of 2011, there are 3342 forest fire prevention headquarters, 3679 fire management offices, and 22,194 full-time staffs in all fire agencies. In nine provinces (autonomous regions or municipalities) it is establish a full-time commander system. Now forest fire prevention organization and command system has been constructed initially, with the central government leadership, local governments take responsibility, and cooperation among the divisions.

3. Community involvement in forest fire management

3.1 Clear the forest fire prevention responsibility

County Government need to sign responsibility agreements on forest fire prevention with town government, and there are similar agreements between towns and villages, and village committees and village groups. The responsibility agreements define the leaders at all levels who take responsibility on forest fire prevention work and also define the management responsibilities of other persons clearly. This ensures that everyone will comply with the relevant requirements, and ensures forest fire safety.

There is a forest fire prevention command in the town government, and forest fire prevention leading group in the villages. Meanwhile, the county and township government organize professional or seasonal fire brigades.

3.2 Fire prevention

3.2.1 Publicity on forest fire prevention

Forest fire prevention publicity set out based on local forest fire management, and mainly includes introduction of forest fire damage, basic knowledge of preventing and extinguishing forest fire, laws, policies and guidelines of the state and local on forest fire prevention.

A variety means were used such as broadcasting, mobile message, Internet, slogans, etc. It is all-around propaganda in forest fire prevention. That would let masses know the forest fire prevention knowledge and self-help methods, improve people safety consciousness, arouse the masses participation in forest fire prevention initiative, and actively involved in the work.

The local government posts forest fire prevention command through radio, television, newspapers and other ways. Boards with slogans were set up on key roads and forests. Leaflets and brochures were sent out to average people. Some local fire agencies held knowledge competition on forest fire prevention to carry out publicity activities.

In fire peak season, the fire agencies put up boards of forest fire danger rating and fire warning flags on key roads or entrances. They also conduct propaganda to tourists in forest parks and let them understand the forest fire prevention regulations. Special session education are carried out in primary and secondary schools to popularize basic knowledge of forest fire and regulations.

3.2.2 Fire sources management

The local fire agencies can establish fire check station, or border check station according to the needs of forest fire prevention, and get the permit from governments at county level or above. In key areas, the fire source is strictly controlled to bring into the forest. During the fire season, all motor vehicles entered forest areas should install fire apparatus in accordance with the provisions, and equip with fire extinguishment equipment. The persons who engaged in production in forests are not allowed to carry fire sources and also forbidden to smoke in the wildlands.

In most areas of China, there is a tradition to burning papers and firecrackers in front of tombs for ancestor worship. Especially, the Qingming Festival (April 5th) is the traditional Tomb-Sweeping Festival, and that is a period with high fire danger easy to cause a forest fire. In recent years, local governments guide people to make use of flowers to substitute the burning of papers, which reduce man-made fire sources in forest. Some local governments also guide the villagers to move the dispersed tombs to the public cemetery.

It is important to educate and supervise to the minors and the mentally deficient personnel. The guardian shall bear the corresponding legal responsibility and economic loss if those persons made cause of forest fires.

3.2.3 Forest fire monitoring

Local forest units should have full-time rangers. Most of the rangers are local villagers. The Rangers patrol forest and monitor fire. In fire season, the village in focal region will establish one or two forest fire patrol groups to manage fires in wildlands. Billboards with the fire alarm telephone number were put up in villages and along the roads, which facilitates masses alarm timely.

In addition, the masses participate in fuel management, clean-up weeds on forest edge, and building fire line. The fuel breaks also were built in afforestation.

3.3 Security fire

Local governments at county level or above can delimit Forest Fire Districts, define the fire season, and release to the public, according to forest resource distribution and forest fire occurrence. During the fire season, fire agencies at all levels and units or individuals who manage forest have to take corresponding prevention measures and emergency preparedness based on fire danger.

Fire is banned in forest fire prevention zone in fire season. During the extreme fire danger period, local governments at county level or above can issue orders to prohibit all fire in wildlands. If the fire used indoor may cause a forest fire, it also need to strict management. Due to production needs for field use, that needs to be approved by the government at county level, and take fire prevention measures in accordance with the requirements. Prescribed burning and agriculture fire need to comply with the regulations.

Seasonal fire brigades were established in some villages, especially in remote forest areas. The members can combined with their production and fulfill their responsibility to control wild fire. In Guangxi province, the masses uses fire in habit to burn sugar cane leaf and cleaning for land preparedness. The seasonal fire brigades can help them to carry out prescribed burning and eliminate the illegal burning.

3.4 Forest fire fighting

Laws defined that professional fire fighting team is the main force for forest fire fighting. Ordinary people are not directly involved in fire fighting on fire line, and they just do some logistics work. Minors and the elderly personnel are prohibited to participate in forest fire fighting.

In recent years, all counties in forest regions established more than one professional fire brigade. In 2011, there are 17,000 fire brigades in professional or semi-professional (seasonal) in China, comprising about more than 510,000 personnel. For example, Yunnan province has more than 12,000 professional fire fighters. All counties, towns and streets set up fire teams prepared to their forest fire prevention task. Headquarters regularly organized those fire brigades trained and drills.

Along with the reform of forestry property right, some private forestry enterprises began to organize fire prevention association, and set up their own fire brigades. For example, in 2012 the town government in Laibin (Guangxi) established 63 semi-professional fire brigades, which main constitute from young cadres and workers in town. Village and forest society established 68 semi-professional forest fire brigades with about 2297 persons involved.

In Jiangsu Province, the militia emergency teams become a main force of forest fire fighting. At present, the 39 counties (cities, districts) in the province have set up 44 militia forest fire emergency response teams, comprising about thousand people. Every year, militia was arranged no less than 3 days training for forest fire prevention.

4. Summary

Current forest fire in China is still relatively serious, and man-made fire source is the main reason for the forest fires. China's forest fire management is universal participation under the leadership of governments at all levels. Especially in the vast rural areas, the masses actively involved in forest fire management, and promote the development of the economy and society.

Field Visit to Bajhghari Community Forest User Group Sharing Experiences on Fire Incident and Community-based Fire Management (CBFiM)

Kabhre Nepal
Wednesday, 21 November 2012

1. Bajhghari Community Forest

Bajhghari Community Forest is located in Kanpur Village Development Committee, central Eastern part of Kabhrepalanchowk District, Nepal (about 65 km, 4 hours drive east to Kathmandu in mid-hills valley). This community forest covers an area of 96.5 ha of forests in the south-west aspect of the Mahabharat range.



Figure 1. The forest plot of Bajhghari Community Forest, Kanpur-7, Kabhre (Photo by P. Koirala, 2012)

The forest primarily consists of pines (*Pinus roxburghii* and *Pinus patula*) dominated pole stage plantation forest; however, it consists of few scattered natural trees of Oak. About 95% of the forest is covered by *Pinus* spp. followed by *Quercus* spp..

2. Bajhghari Community Forest User Group

The Bajhghari CF was handed over to the local community, organized as Bajhghari Community Forest User Group (CFUG), in 1995 by the District Forest Office (DFO) to protect, manage and sustainable use. A total of 275 households are involved in the group. The CFUG is heterogeneous in caste and ethnic composition and mainly includes Brahmin, Chhetri and Tamang. The majority of the households (about 80% of the total) depend on farming for their livelihoods.

The socio-economic status better off, mid-wealthier and poor is divided of the users themselves based on various economic and social criteria. This kind of criteria is being used to distribute the benefits based on equity concept. The main criteria set for the well-being ranking includes income sources, landholdings, livestock, condition of house and other infrastructures, social and political status, education and employment.

3. CBFiM in Bajhghari CFUG

A training held in 2010 February for fire management and during training a network committee was also formed. The members had received fire management techniques and preventive measures by a technical team of District Forest Office, Kabhre. However, they could not get the modern fire fighting equipments.

Meantime, recently followed after the training, a very sad event occurred in which a big crown fire occurred and almost 90 per cent forest were affected by the fire. The uncontrolled fire damaged about 8000 pole trees and still the fire scars are on the field. During fire incident to control the fire a team of military and police had been deployed and took control over the boundary of the forests and themselves they practiced counter fire on the forest land.

Mostly damaged trees were harvested and cleared from the forest land after one year after granting permission from the District Forest Office. However, still the forest is not so much cleared.

How the incident had been occurred still mystery for them. According to them, the incident not only damaged the forest it also impacted on the crop field and private houses around the forest land and particularly over the top of the hilly hamlets



Figure 2. Fire damage scars on pine trees (Photo by P. Koirala, 2012)

**Field Visit to Banjhghari Community Forest User Group
demonstrating Community-based Fire Management (CBFiM)**

Kabhre and Bhakapur, Nepal
Wednesday, 21 November 2012

Programme

- 07:45 Gathering in the Hotel Lobby (Godawari Resort)
8:00 Departure to Kabhre Dhulikhel
9:30 Dhulikhel City
10:45 Bhakunde/Kanpur-7 Banjh Ghari CF (On the way at Dandapokhari a brief overview of the community forest location by District Forest Office, Kabhre)
11:00-12:30
 - Welcome by CFUG at entrance of the forest
 - Fire situation and Fire Management plan by Community Forest users (Discussion, queries and interaction)
 - Demonstration exercise on model CBFiM in Sundar Community Forest User Group Hetauda at Banjhghari CFUG forest
12:30 -13:30 Banjhghari to Dhulikhel
13:30- 14:30 Lunch at Himalayan Horizon Resort
14:30- 15:00 Interaction with District Forest Officer, Kabhre at the Resort
15:15- 17:30 Arrival at Godawari Village Resort

Tour Coordination: Mr. Sundar Sharma, Mr. Pashupati Koirala
Vehicle: Bus/Mini Coaches