



# Forestry Department

Food and Agriculture Organization of the United Nations

## Fire Management Working Papers

### Fire Management Needs and Actions in the Southeast Asian Region

*A regional workshop for the implementation of the Voluntary Guidelines for  
Fire Management, 10-13 November 2008, Pekanbaru, Indonesia*



by  
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2008

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The purpose of these papers is to provide early information on on-going activities and programmes, and to stimulate discussion.

Comments and feedback are welcome.

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## **FOREWORD**

Fires impact upon livelihoods, ecosystems and landscapes. Despite incomplete and inconsistent data, it is estimated that 350 million hectares burn each year; however, the nature of fires determines whether their social, cultural, environmental and economic impacts are negative or positive. Up to 90 percent of wildland fires are caused by human activities primarily through uncontrolled use of fire for clearing forest and woodland for agriculture, maintaining grasslands for livestock management, extraction of non-wood forest products, industrial development, resettlement, hunting and arson - thus any proactive fire management needs to adopt integrated, inter-sectoral, multi-stakeholder and holistic approaches. The situation varies markedly in different regions of the world.

In accordance with recommendations of the International Wildland Fire Summit in October 2003, the Ministerial Meeting on Sustainable Forest Management in March 2005 and the FAO Committee on Forestry (COFO), also in March 2005, FAO coordinated a multi stakeholder process to prepare the Fire Management Voluntary Guidelines as part of a global strategy for international cooperation in fire management.

The voluntary guidelines set out a framework of legally non-binding principles and internationally accepted strategic actions. They address the cultural, social, environmental and economic dimensions of fire management at all levels.

The Fire Management Voluntary Guidelines can be viewed on:  
<http://www.fao.org/docrep/009/i9255e/i9255e00.htm>

This Working Paper reports on the outcomes of the regional meeting in Pekanbaru, Indonesia, where five countries (Indonesia, Malaysia, Philippines, Thailand and Vietnam) used the Fire Management Voluntary Guidelines to conduct needs analysis and assessment of future activities in fire management in their countries. The participants compiled an action framework/simple logical framework to be used for elaborating national programs and projects to strengthen fire management capacity and capability in their countries. The countries are encouraged to use the action frameworks for seeking national and/or external support for their fire management activities.

The regional workshop was organized as an initiative of the Food and Agriculture Organization of the United Nations (FAO) in technical collaboration with the Asia Pacific Association of Forestry Research Institutions (APAFRI).

The regional workshop was assisted by resource persons from the ASEAN Secretariat, The Nature Conservancy (TNC), Asia Pacific Resources International Holdings Ltd (APRIL), the International Tropical Timber Organization (ITTO) and FAO.



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## **Background**

The FAO Fire Management Voluntary Guidelines - Principles and Strategic Actions (Working Paper FM/19/E) set out an international framework of legally non-binding principles and internationally accepted strategic actions, which provide a holistic approach to fire management and can be used for policy reviews, planning and management of fires.

The 18<sup>th</sup> Committee on Forestry (March 2007) and Hanoi Forestry Week associated with the Asia Pacific Forestry Commission (April 2008) recommended that FAO should work with members and partners, including the private sector, forest owners and non-governmental and inter-governmental organizations to promote wider understanding and implementation of these Voluntary Guidelines.

The regional workshop was organized as an initiative of the Food and Agriculture Organization of the United Nations (FAO) in technical collaboration with the Asia Pacific Association of Forestry Research Institutions (APAFRI).

## **Objective**

The objective of the Regional Workshop “Fire Management Needs and Actions in the Southeast Asian Region” was to promote sustainable land management by establishing principles for responsible fire management including:

- Facilitating establishment and implementation of policies and planning mechanisms
- Promoting cooperation in fire management between agencies and organizations
- Promoting community-based fire management

The purpose of the meeting was to present and discuss the Fire Management Voluntary Guidelines, assess and prioritize needs and prepare an action framework to strengthen fire management policies, planning and practices.

## **Activities**

The four-day regional workshop was the final phase of the planning process which started with national level multi-stakeholder orientation process in the participating countries. During the national level multi-stakeholder orientation process countries went through the guidelines and put together a summary of the fire management situation in the country presented during the first day of the regional workshop. The detailed programme of the regional workshop is as in Annex I.

25 senior- and mid-level fire management officers responsible for forest fire management in the national forest administrations from Indonesia, Malaysia, Thailand, the Philippines and Vietnam participated in the regional workshop. The workshop was assisted by resource persons from the ASEAN Secretariat, The Nature Conservancy (TNC), Asia Pacific Resources International Holdings Ltd (APRIL), the International Tropical Timber Organization (ITTO) and FAO. There was also a representative from Singapore. The list of participants is appended as Annex II.

A one-day field trip hosted by Asia Pacific Resources International Ltd (APRIL) Riaupulp to visit their industrial fibre plantation provided participants with the opportunity to see sustainable fibre plantations, conservation forest and community development programmes as well as a demonstration of Riaupulps fire suppression capabilities aimed at protecting plantation and conservation assets.

Each of the participants was given a CD, with all the presentations and group work outputs on the last day of the workshop.

## **Outcomes**

The participants prioritized problems critical to fire management sector in their countries by brain storming and discussions in breakaway country groups. After agreeing on priority areas the groups developed actions frameworks for these priority areas. These frameworks will form the basis for future implementation in the form of 1-5 years project, programme and strategic proposals upon the participants' return to their countries.

Even though the fire management sectors in the four participating countries are very different with regard to the burned area, land tenure, economic situation, political engagement etc. there were common areas that the four countries pinpointed as most important to address. Interaction between fire and climate change, fire awareness and education, fire and resource management planning, fire monitoring and assessment (including ecological effects of fire and fire danger rating systems), and linkages between fire and sustainable livelihoods were pinpointed to be crucial to address in order to achieve a better fire management in the countries.

The action frameworks are detailed in Annexes III.

## **Follow-up**

The importance of the follow-up activities was stressed during the last day of the workshop. The workshop was only the beginning of the implementation process that will continue during the coming months and years. The participants were given guidance in funding opportunities for technical support. Even though FAO is mainly a knowledge based organization FAO offers some funding possibilities (TCP, GCP and NFP Facility). The countries were however advised to also pursue opportunities with:

- Government programmes (central/national, sub-national),
- International agencies (ITTO, Asian Development Bank, World Bank, etc.),
- Bilateral donors (Austria, Italy, Germany, Korea, France, Netherlands, Finland, USA, European Union, Sweden, Norway, Japan etc.),
- The private sector (international and national investors)
- NGO's (TNC, WWF, IUCN, CIFOR etc.)

## **Conclusions**

The first step of the implementation process of the Fire Management Voluntary Guidelines in Indonesia, Malaysia, Philippines, Thailand and Vietnam was taken during the workshop “Fire Management Needs and Actions in the Southeast Asian Region”.

The participants outlined a detailed plan on how to address priority areas in fire management between institutional, economic, social and cultural, environment and landscape dimensions as well as how to strengthen sustainable livelihoods and land-use.

The anticipated outcomes to be worked upon by the participants on their return were to achieve: i) greater stakeholder participation; ii) more clear and consistent policy, legal and regulatory frameworks; iii) better planning and improved field practices.

According to the evaluation of the workshop the workshop was perceived as beneficial to the participants work. 90% of the participants found the workshop content and organization good or very good. The main results of the evaluation are presented in Annex IV.

The participants will have to pursue the implementation of the Fire Management Voluntary Guidelines. It is strongly suggested that the countries request support from their governments, FAO and other donor agencies for technical support and funding opportunities

## Annex I Program

<b><i>Day 1 – Monday, 10 November 2008</i></b>	
<b>Introduction</b>	
08:30 – 09:00	Registration
09:00 – 09:15	Opening of Workshop (Local authorities, FAO)
09:15 – 09:30	Introduction of participants
09:30 – 10:00	Fire management in the region (ASEAN, ITTO, TNC)
10.00 – 10:15	Setting the scene & objectives (FAO)
10:15 – 10:30	Logistics and housekeeping (APAFRI)
10:30 – 10:45	Coffee break
11:00 – 11:30	Fire Management Voluntary Guidelines & discussion (FAO)
12:00 – 13:00	Lunch
13:00 – 14:00	Presentation of synthesis of the results of the questionnaire <ul style="list-style-type: none"> <li>– Indonesia</li> <li>– Malaysia</li> </ul>
14:00 – 14:15	Coffee break
14:15 – 15:45	Presentation of synthesis of the results of the questionnaire <ul style="list-style-type: none"> <li>– Philippines</li> <li>– Singapore</li> <li>– Thailand</li> <li>– Vietnam</li> </ul>
15:45 – 16:00	General discussion and questions
19:00	Welcome dinner
 <b><i>Day 2 –Tuesday, 11 November 2008</i></b>	
<b>Problem Analysis</b>	
08:30 – 08:40	Opening and presentation of the programme of the day
08:40 – 08:50	Summary of syntheses
08:50 – 09:15	The Principles and Strategic Actions
09:15 – 09:45	Group work
09:45 – 10:00	Coffee break
10:00 – 12:00	Group work continues
12:00 – 13:00	Lunch
13:00 – 15:45	Group work continues
15:45 – 16:00	Coffee break
16:00 – 17:00	Group presentation of the day's work <ul style="list-style-type: none"> <li>– Indonesia</li> <li>– Malaysia</li> <li>– Philippines</li> <li>– Thailand</li> <li>– Vietnam</li> </ul>
17:00 – 17:30	Conclusions of the day and discussions

<b><i>Day 3 – Wednesday, 12 November 2008</i></b>	
<b>Field trip</b>	
<b><i>Day 4 – Thursday, 13 November 2008</i></b>	
<b>Proposing action – Action framework</b>	
08:30 – 08:45 Opening and presentation of the programme of the day	
08:45 – 09:15 Action framework	
09:15 – 10:15 Group work	
10:15 – 10:30 Coffee break	
10:30 – 12:30 Group work continues	
12:30 – 14:00 Lunch	
14:00 – 14:15 Group presentations – Indonesia	
14:15 – 14:30 Group presentations – Malaysia	
14:30 – 14:45 Group presentations – Philippines	
14:45 – 15:00 Group presentations – Thailand	
15:00 – 15:15 Group presentations – Vietnam	
15:15 – 15:30 Coffee break	
15:30 – 16:30 Follow-up actions	
16:30 – 17:00 Evaluation and Closing	



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## Annex III Action frameworks

### *Indonesia*

Problem	Priority action	Activities	Stakeholders	Time Framework	Budget Framework	Constrain
<b>Principle 1 Sustainable livelihood</b>	<p>1. Illegal and unplanned fires threaten natural forest assets and sustainable livelihoods need to be prevented and suppressed</p> <p>3. Cost effective alternative for land preparation without frequent burning made available.</p> <p>6. Monitoring and evaluation of the impacts of unplanned need enhance and communication in local level</p>	<p>1a. Socialization regulation, zero burning in local govt and local community in prone province</p> <p>b. Empowerment local communities on land- and fire mgt in prone province</p> <p>c. Increase commitment of local govt and local com</p> <p>3a. Model village in prone province with incentive</p> <p>b. Training for zero burning, alternative livelihood</p> <p>c. Incentive for zero burning equipment</p> <p>6.a. Promoted impact of fire</p> <p>b. Estimation of damage caused by fire, economic valuation, guidelines to count a loses</p> <p>c. Rehabilitation and restoration</p>	Local Government, Community, Companies by Com Dev	Long term Long term Long term	Rp. 8.25 m/year Rp. 20 m/year Rp.2 m/yr	<p>a. Some times the policy of land use in local level do not follow the policy in national level</p> <p>b. Land tenure administration in local level</p> <p>c. Commitment of local government</p> <p>d. Lack of people awareness</p> <p>e. Transfer of knowledge to local people example FRDRS, Impact and smoke and haze</p>
<b>Principle 8 Legislation and governance</b>	1. The FAO principles and strategic actions just beginning to be used as a basis for developing and implementing national or local legislation	<p>1a. Socialisation of guidelines</p> <p>b. Development of related regulation in local level</p> <p>c. Implementation and enforcement</p>	National Government/FAO Local Government	Long term	Rp 3 m	

	<p>2. Planned burning for land clearing is illegal under the current legal framework and it is need to be review to promote the responsible use of fire</p> <p>3. Coordination between forestry and agricultural need improvement by implementing the FAO Strategic Action.</p>	<p>2a. Socialisation of prescribe burning</p> <p>b. Increase awareness and law enforcement</p> <p>c. Develop regulation Prescribe burning</p> <p>3 To encourage certification of palm oil product</p>		Long term	Rp 10 m /year	
<b>Principle 10 Cooperation</b>	<p>1. common terminology, organisational systems and standards are needed to enhance international cooperation (ICS)</p> <p>2. Continue exchange of knowledge, technology and fire fighting resources is needed to improve rapid international response to wildfires</p> <p>3. Participation in international organizations (ASEAN, FAO, ITTO etc.) networks, for and activities must continue to enhance domestic and international capacity and rapid international response.</p> <p>4. Cooperation agreement between local, national government and private stakeholder as well as international stakeholder are needed to improve cooperation.</p>	<p>1a. Legislation</p> <p>b. Guidelines, SOP</p> <p>c. Training of ICS</p> <p>2a. Update knowledge of technology</p> <p>b. Revitalization of personnel and equipment</p> <p>c. Simulation</p> <p>3a. Seminar for information exchange</p> <p>b. Training for law enforcement for fires (100 persons)</p> <p>4 Establishment of Agency concerning International cooperation</p>	National Government /BNPB	Long term	Rp. 3 m	

<b>Principle 11 Knowledge Transfer</b>	<p>2. Technical knowledge combine with local knowledge need to be enhance to improve the responsible use of fire for land preparation.</p> <p>4. Community Based Fire Management preparedness and response is needed to minimize unwanted wildfires.</p> <p>6. Local communities must be train to properly apply and manage fire for positive ecological, cultural and economic benefit without costing environmental damage and severe smoke and haze.</p> <p>7. Technical material needs translation to be properly understood for fire managers, fire fighter and local community. Scientific, research and technical materials translated</p>	<p>2a. Research of local wisdom b. Dev of research result through socialization c. Pilot Project for research result</p> <p>4a. Education for local people b. Training for local people c. Develop Pilot Project</p> <p>6a. Empowerment b. CBFM c. Local Wisdom</p> <p>7 Translation, dissemination</p>	Local government, Community, University	Long term	Pm	
<b>Strategic Action 4 Fire Prevention</b>	4. Community fire prevention program must include information on the need to use and manage fire safely and responsibly	4 Socialization better understanding in regulation, method through training and capacity building for local community in 10 prone province	Community, Local Government, NGO, University, Experts	Long term	Rp. 10 m	

## ***Malaysia***

Problem/ Outcome	Priority Action/ Output	Activities	Stakeholders and external support	Time framework	Budget framework	Constraints and challenges
<b>Fire effects on ecosystem</b>	<p>1. Assessment of strategically placed, planned burning with some short-term negative environmental impacts play important role in long-term landscape and community asset protection.</p> <p>2. Minimization and prevention of the introduction and spread of pest or invasive plants and animals plant diseases, insect pests and biological contaminants after fires or fire-suppression activities.</p> <p>3. Minimizing the spread of unwanted alien species and promotes or re-establishes natural or other preferred species.</p>	<p>1. Carry out planned burning study.</p> <p>2. Collect information and data from other countries on planned burning.</p> <p>3. Develop appropriate SOP on prevention of the introduction and spread of pest or invasive plants.</p> <p>4. Identify appropriate remedial actions in burnt areas such as establishment of nursery for suitable indigenous species.</p>	<p>NRE, FDs, FRIM, AD, UPM, UKM, UMS, UNIMAS, NGOs</p> <p>ASEAN Secretariat</p>	2009 - 2013	USD 450,000	<p>1. Lack of local expertise.</p> <p>2. Availability of budget due to less priority among policy makers in comparison with other issues.</p>

<b>Interactions between climate change and fire</b>	<ol style="list-style-type: none"> <li>1. Adaptation of the fire-management plan and policies to take into account fire risk as a result of climate change.</li> <li>2. Minimization and mitigation of the short and long term consequences of fire-induced vegetation depletion.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review existing fire-management plan and incorporate the fire risk of a result of climate change.</li> <li>2. Identify appropriate mitigation measures to mitigate the short and long term consequences of fire-induced vegetation depletion.</li> <li>3. Strengthen the monitoring capabilities on fire effects.</li> </ol>	<p>MOSTI, NRE, FRD, FDs, FRIM, AD, UPM, UKM, UMS, UNIMAS, DoE, NGOs.</p> <p>ITTO, FAO, IPCC</p>	2010 – 2011	USD 500,000	<ol style="list-style-type: none"> <li>1. Insufficient of local expertise.</li> <li>2. Expensive of research equipment.</li> </ol>
<b>Fire danger rating systems</b>	<ol style="list-style-type: none"> <li>1. Establishment of a fire danger rating system or adaptation of an existing system to the local environment and condition.</li> </ol>	<p>Strengthening of the existing fire danger rating system to reflect local condition.</p> <ul style="list-style-type: none"> <li>• Collect more meteorological data</li> <li>• Comprehensive fuel classification and mapping</li> </ul>	<p>FDs, MMD, MACRES, MACGDI</p> <p>CIDA, FAO</p>	2009 - 2010	USD 1.5 million	<ol style="list-style-type: none"> <li>1. Lack of appropriate expertise to carry out system adaptation.</li> </ol>
<b>Fuel management</b>	<ol style="list-style-type: none"> <li>1. Evaluation fuel treatment activities as an essential component in Fire-Management programme.</li> <li>2. Assess fuel reduction programme in plantation area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review and improve current fire management programme.</li> <li>2. Develop strategy for fuel reduction programme.</li> </ol>	NRE, FDs, MoA, MOPIC	2009 - 2013	USD 350,000	None

<b>Monitoring and assessment</b>	<ul style="list-style-type: none"> <li>1. Establish a comprehensive plan for monitoring and assessing all aspects for the fire-management programme.</li> <li>2. Conceptualize programme to monitor the ecological effects of fire and of suppression methods.</li> </ul>	<ul style="list-style-type: none"> <li>1. Review current monitoring programme.</li> <li>2. Enhance networking among the stakeholders</li> <li>3. Carry out relevant study of the ecological effects of fire and of suppression methods.</li> </ul>	NRE, FDs, FRIM, DoA, FRD	2009 - 2013	USD 350,000	None
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#### ABBREVIATIONS

DoA	Department of Agriculture
DoE	Department of Environment
FD	Forestry Department
FRD	Fire and Rescue Department
FRIM	Forest Research Institute Malaysia
MACRES	Malaysian Centre for Remote Sensing
MACGDI	Malaysian Centre for Geospatial Data Infrastructure
MoPIC	Malaysian of Plantation Industrial Commodities
MMD	Malaysia Meteorological Department
MoSTI	Ministry of Science, Technology and Innovations
NGOs	Non Governmental Organizations
NRE	Ministry of Natural Resources and Environment
UPM	University Pertanian Malaysia
UKM	University Kebangsaan Malaysia
UMS	University Malaysia Sabah
UNIMAS	University Malaysia Sarawak

## ***Philippines***

Problem/Concern	Priority Action/Output	Activities	Stakeholders and external support	Time Framework	Supplemental Budget Framework (USD)	Constraints and Challenges
<b>1. Fire and resource management planning</b>	1. All fire-management plans and activities based on a clear and comprehensive policy, legal and institutional framework.	<ul style="list-style-type: none"> <li>a. Harmonization of policies among government agencies responsible in environmental protection.</li> <li>b. Develop appropriate legislation that would identify responsibilities as well as penalties for an effective forest fire management.</li> </ul>	DENR, DILG, NGOs, POs, LGUs, OGAs	MT		
	2. Plans prepared at an appropriate level of detail for every aspect of fire management (including use, prevention, fuel management, detection, initial attack, large-fire suppression and restoration.	<ul style="list-style-type: none"> <li>a. Comprehensive identification of forest fire prone areas within respective local areas of responsibilities.</li> <li>b. Establishment of geographical location to determine areas intended for fire suppression scenarios.</li> </ul>	- do -	LT	18,000*  5,000	Continuous activity that requires monitoring and evaluation

	<p>3. A policy established that sets the safety of firefighters, fire managers and the public as the highest priority.</p>	<p>a. Procurement of fire fighting gears and equipments, first aid kits for forest fire suppression scenarios.</p>	- do -	ST	36,000	Maintenance and upgrading
	<p>4. A process should be developed to determine in advance of a fire, who will assume the lead role and duties (in areas where multiple agencies or organizations have fire-management responsibilities.</p>	<p>a. MOA or MOU between GO's and NGO's with mandates/objectives for environmental protection.</p>	- do -	ST		
	<p>5. Resource management plans should include analysis of the actions that increase or decrease the risk and hazards affecting fire behaviour, fire damage or benefit, impacts on the safety of firefighters and fire managers and the public.</p>	<p>a. Evaluation and assessment of present standard operating procedures used in fire prevention and suppression scenarios</p> <p>b. Development of standard operating procedure based on the assessment made on the previous procedure followed in relation to 5.a.</p>	-do- -do-	LT MT		

	6. Plans should be based on the types of ecosystems, potential fire effects, fire regimes, and social, economic and environmental values.	a. Creation of forest fire prevention program that is centered on economic and environmental value.	-do-	ST	10,000	Year round activity that requires continued funding support
	7. Plans should provide for infrequent but potentially damaging events analysis, planning and identification of the resources and potential operational actions required.	a. Inventory of records specific on the availability of resources as follows; no. of fire fighters, tools and equipments, maps, and linkages with other GOs and NGOs	-do-	ST	*	
	8. Plans should be based on climate, realistic weather forecasts and the effect on fire behaviour and suppression effectiveness and include maps indicating forecast fire danger.	a. Collaboration to weather forecasting agency as to the availability of data that is necessary in the success of any forest fire suppression operations.	-do-	ST		
	9. Organizations, agencies, governments and communities should developed a process	a. Introduction of a Community Based Forest Management Program approach	-do-	ST	5,000	Year round activity that requires continued funding support

	for involving local communities, communities of interest and others when preparing resource- and fire-management plans.					
	10. Plans should provide for a system of monitoring and evaluation a feedback process for amending or adapting the plans based on evaluations or changing conditions.	a. Development of an updated monitoring, feedback and records system evaluation in cooperation with other key players in the environmental protection	- do -	LT		
<b>2. Fire management in natural or protected areas and reserves</b>	1. Fire plans and guidelines should identify the unique character of and objectives for the area considering the role that fire plays in restoring or maintaining that special character.	a. Implementation of guidelines in the implementation of fire management in protected areas.	-do-	ST		
	2. Consideration should be given to using appropriate fire management actions that will not adversely impact surrounding	a. Application of zero burning policy in relation to clean air act on areas that are prone to forest fires	-do-	ST		

	areas, assets or sustainable livelihoods.				
	3. Plans, guidelines and operational procedures should be developed with a view to mitigating any unwanted or damaging impacts from planned burning in these areas.	a. Application of zero burning policy in relation clean air act on areas that are prone to forest fires	-do-	ST	
	4. Care should be taken to ensure that invasive plants or diseases are not introduced through fire-suppression actions and the use of fire equipment and machinery.	a. Identification of chemical to be use as agent in fire suppression operations	-do-	ST	
	5. When fire occurs intolerant areas, or when a particular fire incident uncharacteristically severe or damaging, suppression tactics should be planned and implemented with a view to mitigating damaging effects (on the protected area	a. Identification of priority areas for categorization in case such scenario happens	-do-	ST	

	from crews, equipment and suppression actions,					
	6. Where fire-dependent natural areas or reserves are located adjacent to valuable commercial or agricultural areas, are detailed plans should be developed to ensure that the unique character and value of the areas can be maintained, while limiting the impact on adjacent areas	a. Identification of priority areas for categorization in case such scenario happens	-do-	ST		
<b>3. Fire awareness and education</b>	1. Fire awareness and educational programmes should be developed and targeted to specific audiences and communities.	a. Production of IEC materials in forest fires that would cater to members of all sectors in the society	-do-	MT	20,000	
	2. Programmes should be sensitive to the cultural and social norms of the Community, including the application of fires to agricultural, forestry, biodiversity	-do-	-do-	MT		

	and traditional uses or to other basic needs.				
	3. Fire awareness and educational materials should be gender sensitive and should reflect local literacy levels including oral presentation where printed material or local language barriers limit effective communication	-do-	-do-	MT	
	4. Age-appropriate information and educational materials should be developed cooperatively by technical experts and educational specialists and provided to all levels introducing ecological and fire-management concepts into local schools.	-do-	-do-	MT	
	5. Primary and secondary schools, universities, nongovernmental organizations and other institutions should be encouraged	a. Inclusion of a fire management subject in the curriculum for the primary , secondary and tertiary schools  b. Inclusion of training	-do-	LT	

	<p>to develop communally and ecologically appropriate fire-management programmes for teachers and other educators based on local conditions and beliefs.</p>	<p>program in forest fire management to the program of instruction intended for the training of newly recruit fire officers/firefighters</p>			18,000	Year round activity that requires continued funding support
<b>4. Fire preparedness including technical training</b>	<p>1. Preparedness plans should include all activities to be undertaken prior to the start of a fire</p>	<p>a. Conduct of fire drill or simulation exercise with regards to forest fire eventualities taking into account the use of appropriate tools and equipment with the participation of the local communities; the scenario shall take into account the procedure for the assessment of risk and procedures to be followed in the unlikely occurrence of forest fire.</p>	<p>- do -</p>	<p>ST</p>	<p>**</p>	
	<p>2. Safety considerations, both for firefighters and the Public, should be a key component of any preparedness plan.</p>	<p>- do -</p>	<p>- do -</p>	<p>ST</p>		

	3. Plans and implementation should be based on an effective and cost-efficient mix of resources and organizations.	- do -	- do -	ST		
	4. Plans should take ecological considerations into account, such as the impact of suppression actions on the environment and the role of fire in the ecosystem or in cultural areas.	- do -	- do -	ST		
	5. Plans should include processes and procedures to assess risk and hazard and to determine appropriate response and mitigation actions.	- do -	- do -	ST		
	6. Plans should be based on predicted fire risk, and staffing and availability levels identified (that correspond to the level of risk).	- do -	- do -	ST		

	7. Plans should assess the capabilities of remote communities and individuals living in outlying areas to protect their own assets and assist fire services in all phases of fire management	- do -	- do -	ST		
	8. All training should be appropriate to local ecological, social and political conditions and should be delivered to the same standard for fulltime, paid, volunteer or other rural workers for the expected fire characteristics.	- do -	- do -	ST		
<b>5. Fire detection, communications and dispatching</b>	1. A robust fire detection system should use an appropriate combination of remote sensing, established land- or water-based locations, aerial routes and private citizen and rural community networks.	a. Acquisition/Installation of fire communication and detection system to all fire prone areas with trained man power to handle its operation ability.	- do -	LT	18,000	Maintenance and upgrading

	<p>2. A public communications system should be in place for the reporting of fires by private citizens and agency personnel and for alerting managers, supervisors, landowners and citizens.</p>	- do -	- do -	- do -		
	<p>3. A dispatch and communications system should be in place to determine the appropriate response to a reported fire, mobilize and support initial- attack and backup fire-suppression resources, and provide appropriate information to responders, volunteers, landowners and others involved in the incident response.</p>	- do -	- do -	- do -		

	<p>4. A communications plan should be developed and translated into local languages to inform the public of threats and potential severe conditions (and to provide prevention messages.</p>	<p>a. Production of IEC materials particularly on safety and evacuation in the unlikely event of forest fires. IEC material should contain strategy to offset threats and potential danger in the occurrence of forest fires</p>	<p>- do -</p>	<p>- do -</p>	<p>**</p>	
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NOTE: ST – SHORT TERM (1-2 YEARS)

MT – MEDIUM TERM (1-3 YEARS)

LT – LONG TERM (1-5 YEARS)

## ***Thailand***

Problem/ Outcome	Priority Action/ Output	Activities	Stakeholders	Time framework	Budget framework
<b>Sustainable livelihoods The appropriate use and management of fire will promote sustainable livelihoods.</b>	5. Are natural fires allowed to burn within an appropriate range of frequency, season and intensity in fire-dependent ecosystems for economic and social benefits, as well as for maintaining habitats and reducing the cost of suppressing unwanted fires?	<ul style="list-style-type: none"> <li>-Research on impacts and effects of fire on different ecosystems and landscapes</li> <li>-Research on fire regimes, fire history</li> </ul>	<ul style="list-style-type: none"> <li>-International research institute</li> <li>-Central &amp; Local Universities</li> <li>-Forest fire division</li> </ul>	10 years	1.5 m US\$/year
<b>Human health and security Human health and security will be improved by minimizing the adverse effects of fire.</b>	3. Is a fire danger rating system developed (or adapted to an existing one, in conjunction with reliable weather forecasting), to provide hazard and risk assessments to agencies, landowners and communities?	Establishing standard fire danger rating system (Fire Index)	<ul style="list-style-type: none"> <li>-International agencies with know-how (US, Canada etc.)</li> <li>-Meteorological Dept.</li> </ul>	2 years	
<b>Monitoring and assessment</b>	4. Is a programme implemented to monitor the ecological effects of fire and of suppression methods (should include cooperation with universities, research organizations and local communities)?	<ul style="list-style-type: none"> <li>-Develop plan for monitoring and assessment.</li> <li>-Monitoring, analyzing, assessment the ecological effects of fire and of suppression methods.</li> </ul>	<ul style="list-style-type: none"> <li>- Central &amp; Local Universities.</li> <li>- Local communities who participate in fire control activities.</li> </ul>	5 years	0.2 m US\$/year

## **Vietnam**

Problem/ Outcome	Priority Action/ Output	Activities	Stakeholders and external support	Time framework	Budget framework ( USD)		Constraints ( Challenges)
					Gov	Ex. Support	
<b>1. Fire and resource management planning</b>	1. Prepare detail plans at the local levels for every aspect of fire management (including use, prevention, fuel management, detection, initial attack, large-fire suppression and restoration)	- To establish the guidelines for making detail plan at the local levels; - To support some pilot detail plans for specify local levels and expanding;	- FPD, local FPD (in collaboration with local administration, communities and forest/land owners and relevant stakeholders)	- Jan. to June.2009  - July to Dec.2009	- 10,000.00  - 40,000.00	- 30,000.00  - 20,000.00	Limited participation from others institutions
<b>3. Fire awareness and education</b>	2. Development of fire awareness and educational programmes that target to specific audiences and communities.  - Improve public awareness on forest fire management	- Identification and classification of the target group; - To set up a relevant awareness and educational programmes for each target group  - Circulation (translation, printing , launching and distribution) the FAO' guidelines in to Vietnamese for stakeholders;	FPD, DOF/MARD collaboration with local level..  - FPD, DOF/ MARD and Local FPD, DOF (in collaboration with local administration, communities and	- From 2009  -Feb. to May .2009	In-kind	- 20,000.00	Knowledge difference in others stakeholders

	<ul style="list-style-type: none"> <li>- Strengthening capacity in forest fire prevention and suppression</li> </ul>	<ul style="list-style-type: none"> <li>- To complete and updated the training material in order to organize the National workshop for stakeholders in 3 regional ( North, Middle, South) of Vietnam.</li> </ul>	forest/land owners and relevant stakeholders)	- Jun. to Sep.2009	- In-kind	- 45,000.00	
<b>13. Planned fire</b>	4. Assess impacts on human health and air quality considered when conducting planned burns.	<ul style="list-style-type: none"> <li>- Collect data and information an others ecological areas</li> <li>- Assess impacts on human heath and air quality base on collected information</li> </ul>	MONRE, MOH	From 2009	In-kind	20,000.000	Limited experience and equipment
<b>15. Monitoring and assessment</b>	5. Develop and implementation of a comprehensive plan for monitoring and assessing all aspects of the fire-management program implemented.	<ul style="list-style-type: none"> <li>- Collect data and information in others ecological zones</li> <li>- To build guideline of monitoring and assessment</li> <li>- Training for local FPD</li> </ul>	FPD/MARD, local FPD	From 2009	In-kind	30,000.00	Limited experience
<b>16. Forest fire and climate change ( propose*)</b>	Assessment of carbon emission in different ecological zones after burning	<ul style="list-style-type: none"> <li>- Collect data and information in others ecological zones.</li> <li>- Analyze data and information</li> <li>- Assess result of research and publication</li> </ul>	FPD/MARD; FRIV/MARD, MONRE	From 2009	Inkind	50,000.00	Limited knowledge and experience

## Annex IV Evaluation

<b>Pre Meeting</b>	(1 = Strongly disagree/ Poor, 5 = Strongly agree/ Excellent)	<b>Average</b>
- Pre meeting information was clear		4.4
- Workshop registration materials informative		4.5
- Workshop contacts were responsive		4.35
- Was the questionnaire received in a timely fashion with clear instructions for completion		4.35
<b>Meeting Presentations</b>		<b>Average</b>
- FAO – overview and Introduction of Guidelines		4.7
- ITTO presentation		4.5
- ASEAN presentation		4.5
- The Nature Conservancy		4.5
<b>Field Trip – APRIL</b>		<b>Average</b>
- Field trip was well planned and organized		4.9
- Field trip was informative		4.65
- Information gained was useful		4.75
<b>General</b>		<b>Average</b>
- Materials provided at the workshop were adequate (handouts, notebooks, CD's)		4.35
- I have better understanding of the Guidelines		4.3
- I have better understanding of how to implement the Guidelines		4.35
- I will use the materials after the workshop		4.4
- Workshop facility was adequate		4.4
Overall rating of the workshop (1= low, 5 = high)		<b>4.4</b>

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Working Paper FPF/1	<i>Guidelines on Fire Management in Temperate and Boreal Forests.</i> November 2002.
Working Paper FM/2	<i>International Wildland Fire Management Agreements Template.</i> Tom Frey, Ricardo Vélez Muñoz. January 2004.
Working Paper FM/3	<i>Legal Frameworks for Forest Fire Management: International Agreements and National Legislation.</i> Fernando Fernández Arriaga, Frédéric St-Martin, Tom Frey, Ricardo Vélez Muñoz. March 2004.
Working Paper FM/4	<i>Community-Based Fire Management in Spain.</i> Ricardo Vélez Muñoz. April 2005.
Working Paper FM/5	<i>Report on Fires in the South American Region.</i> María Isabel Manta Nolasco. March 2006.
Working Paper FM/6	<i>Report on Fires in the North East Asian Region.</i> Leonid Kondashov. March 2006.
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Working Paper FM/10	<i>Report on Fires in the Southeast Asian Region.</i> B.J. Shields, R.W. Smith and D. Ganz. March 2006.
Working Paper FM/11	<i>Report on Fires in the Balkan Region.</i> N. Nikolov. March 2006.
Working Paper FM/12	<i>Report on Fires in the Caribbean and Mesoamerican Regions.</i> A.M.J. Robbins. March 2006.
Working Paper FM/13	<i>Report on Fires in the Australasian Region.</i> P.F. Moore. March 2006.
Working Paper FM/14	<i>Report on Fires in the South Asian Region.</i> A.M. Benndorf and J.G. Goldammer. March 2006.
Working Paper FM/15	<i>Report on Fires in the North American Region.</i> R. Martínez, B.J. Stocks and D. Truesdale. March 2006.
Working Paper FM/16	<i>Report on Fires in the Central Asian Region and adjacent countries.</i> Johann G. Goldammer. March 2006.
Working Paper FM/17	Fire management: voluntary guidelines. Principles and strategic actions. 2006. FAO, Rome, December, 2006 (E, F, R, S)
Working Paper FM/18	Fire management: Review of international cooperation. FAO, Rome, December 2006
Working Paper FM/19	Fire management voluntary guidelines - Preparing for action - country and regional level methodology. Vuorinen A. P., Rosengren, L.M. 2008
Working Paper FM/20	Implementing the Fire management voluntary guidelines - Report of the regional workshop of Trinidad and Tobago, 20-23 November 2007. Vuorinen A.P. 2008
Working Paper FM/21	Implementación de las directrices de carácter voluntario - Informe del taller regional en Cuba, 12-16 Noviembre 2007.(S) Pieter van Lierop 2008
Working Paper FM/22	Fire Management Voluntary Guidelines - Preparing for action - country level methodology. Vuorinen A.P. 2008

