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EXECUTIVE SUMMARY

Synthesis of the Assessment of the ITTO Completed Projects and the Use of the ITTO Guidelines on Fire Management as a Thematic Group on Forest Fires

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1.   Introduction

The primary purpose of the evaluation was to assess all completed ITTO-sponsored projects on forest fires and their use of the ITTO Forest Guidelines on Fire Management Tropical Forests (1997), so as to point out the successful and unsuccessful outcomes, the reasons for successes and failures, and the contribution of the project towards the achievement of ITTO's Objective 2000 and its policy work on forest fires, and to draw lessons that can be used to improve similar projects in the future and possibly provide the basis for establishing a specific programme of work on forest fires within ITTO. In addition, this evaluation is to also assess the use and/or implementation of the ITTO Guidelines on Fire Management in Tropical Forests (1997), through a review of the outcomes, achievements and lessons learnt of all completed ITTO projects on forest fire.

2.   Evaluated Projects

The projects included in the evaluation are listed in Table 1.

Table 1. Overview of evaluated projects
Note: Implementing Agencies: E.A. = Executing Agency; C.A. = Collaborating Agency

	PD. No.	Project Title and Timeframe	Implementing Agency
-AFRICA			
1	PD 032/98 Rev.1 (F)	Forest Fire Management in Ghana (1999-2003)	E.A.: CSRI Forestry Research Institute of Ghana (FORIG)
2	PD 284/04 Rev.2 (F)	Fire-Management and Post-Fire Restoration with Local Community Collaboration in Ghana (2005-2010)	E.A.: IUCN West African Regional Programme (WARPO) C.A.: FORIG C.A.: Resource Management Support Centre (Kumasi) (RMSC)
3	PD 051/98 Rev.1 (F)	Forest Fire Management in Côte d'Ivoire on an Experimental Basis (2000-2005)	E.A.: Société des Developpement des Forêts (SODEFOR)
-ASIA – PACIFIC			
4	PD 017/87 (F)	Investigation of the Steps needed to Rehabilitate the Areas of East Kalimantan Seriously Affected by Fire (1989-1990)	E.A.: Agency for Forestry Research and Development, Ministry of Forestry, Indonesia
5	PD 084/90 (F)	The Establishment of a Demonstration Plot for Rehabilitation of Forest Affected by Fire in East Kalimantan [Phase II of PD 17/87 (F)] (1992-1994)	E.A.: Agency for Forestry Research and Development, Ministry of Forestry, Indonesia
6	PD 012/93 Rev.3 (F)	Integrated Forest Fire Management in Indonesia - Phase I: National Guidelines on the Protection of Tropical Forests against Fire (1997-1999)	E.A.: Faculty of Forestry, Bogor Agricultural University
7	PD 228/03 Rev.3 (F) I	Tropical Forest Fire Monitoring and Management System Based on Satellite Remote Sensing Data in China – Phase I (2006-2007)	E.A.: Research Institute of Forest Resources Information and Techniques, Chinese Academy of Forestry (IFRIT, CAF)
8	PD 228/03 Rev.1 (F) II	Tropical Forest Fire Monitoring and Management System Based on Satellite Remote Sensing Data in China – Phase II (2008-2009)	Ditto
-LATIN AMERICA			
9	PD590/10 Rev.1 (F)	Integrated Fire Management in Rural Communities of Guatemala: Establishment of Pilot Sites for the Implementation of Sustainable Integrated Fire Management Practices (2011-2014)	E.A.: Asociación Vivamos Mejor (AVM)
10	PPD153/11 Rev.1 (F)	Forest Fire Prevention through the Implementation of Regional Actions with the Participation of Local Communities and other	E.A.: Asociación de Corporaciones Autónomas Regionales y de Desarolo

		Relevant Stakeholders so as to Ensure the Protection of Forests and Ecosystem Services (2012-2013)	Sostenible (ASOCARS), Colombia
11	PD441/07 Rev.2 (F)	Institutional Strengthening of ANAM for Integrated Fire Management in the Tropical Forests of Panama (ongoing since 2010)	E.A.: Autoridad Nacional del Ambiente (ANAM) (soon to become Ministry of Environment)

3. Findings: Analysis and Assessment of the Ex-post Project Evaluation

In the main report a summary assessment is provided for each of the projects listed in Table 1.

4. Summary Assessment of the Evaluated Projects

The involvement of ITTO in addressing wildfires in tropical forests goes back to the early 1980s. The accelerating use of fire in land-use change in the 1980s was first visible during the El Niño / Southern Oscillation (ENSO) drought in South East Asia in 1982-83, which resulted in escaping land-use fires and large-scale burning of native undisturbed rain forest and other vegetation by wildfires. The destruction of fire-sensitive tropical forest and the secondary effects, notably regional smoke pollution, prompted the Government of Indonesia to seek assistance from the ITTO in assessing fire damages and developing methods to rehabilitate fire-damaged rain forest ecosystems.

While no other ITTO member producer country had requested similar assistance during the 1980s and the early 1990s, the situation in Indonesia became a prime example of a country that evolved rapidly from a "forest country" – or a country in which native forests were the predominant land cover – to an agrarian and industrial society. For this development forest and other native vegetation – including peat-swamp biomes – were an obstacle, which could be overcome only by the most powerful but equally destructive force of fire.

Recognizing the underlying causes of increasing fire use in land management, the socio-economic and socio-ecological dimensions of interaction between humans and fire, the ITTO went further and supported the process of developing advisory tools for fire management for local, national and international actors. The development of the "National Guidelines on the Protection of Tropical Forests against Fire" for Indonesia went along and timely parallel with the development of the "ITTO Guidelines on Fire Management in Tropical Forests" for international use. The term "Integrated Fire Management" (IFM), which was introduced in Indonesia in the early 1990s by the GIZ-supported Integrated Forest Fire Management Project (IFFM) in East Kalimantan, described an increasingly acceptable concept of moving from the classical "fire prevention and control" approach to a more diverse concept. "Integration" became a unifying concept of empowerment of rural and forest people to take responsibility for both, the benign use of fire and the control over fire.

Apart to the Maritime Continent of South East Asia the West African region became affected by the cumulative effects of climate extremes – the consequences of teleconnections of the El Niño / Southern Oscillation (ENSO) – and similar socio-ecological developments. Apart of Indonesia Ghana was one of the countries hit worst by the 1982-83 El Niño drought and devastating wildfires. Similarly to the involvement in Indonesia the ITTO supported projects that built on each other. First, a project was supported, which aimed at developing an understanding of causes and effects of forest fires in order to find effective means of fire management in future. The second ITTO-funded project "Fire management and post-fire restoration with local community collaboration" built on the first project, allowing targeted and finally very successful approaches in fire management, notably through participation of local communities.

The concepts of the projects in Côte d'Ivoire, Colombia, Guatemala and Panama seem to have profited from the experiences gained in the pioneering projects in Indonesia and Ghana.

In addition an interesting and obviously successful approach was implemented in the project "Tropical Forest Fire Monitoring and Management System Based on Satellite Remote Sensing Data" in China. Here the development and application of satellite remote sensing information down to the local fire management level could prove that apart of community-based fire management approaches, sometimes referring to traditional methods of community participation in forest and fire management, could be supported by advanced technologies.

5.   Lessons Identified

There are four major lessons identified in the course of the evaluation:

Cumulative and synergistic effects of multiple thematic projects

The outcomes of three associated ITTO-sponsored fire management projects in Indonesia and two consecutive projects in Ghana revealed

- Consecutive projects that are building on each other allow successive building of capacities in fire management
- The continuing involvement of a local (national) Executing or Collaborating Agency (including a research / academic organization) ensures enhancing local / national competency in fire management (or fire science)

In the case of the Ghana project further inputs came from the project "Wildfire Management in the Transitional Zone" which was funded by the Government of the Netherlands. These projects created synergies that contributed to the overall success of the joint endeavour.

Influence of project sustainability is influenced by extrinsic, often not foreseeable factors

In principle this is not a new lesson identified. The sustainability of project outcomes indeed is never predictable. The ITTO-supported fire management projects, however, provide interesting examples of success and of low- to none-impact, which both lie outside of the sphere of influence of the donor.

Example of success

In the case of the projects implemented in Ghana the project results and – at least currently – the post-project functioning of the introduced community-based fire management approach are a merit of sound, constructive cooperation between the Implementing Agencies and the target groups, i.e. the local communities. More than 30 years ago destructive wildfires had affected the country, and since then solutions had been sought to motivate, activate and empower local communities to take over responsibility in fire management. The two ITTO projects, flanked by other donor support, offered an opportunity to set up piloting examples, which show encouraging results. Despite of the phasing out of the project the communities through Community Fire Volunteer Groups are still acting and performing successfully. The ex-post evaluation of the second project "Fire-Management and Post-Fire Restoration with Local Community Collaboration in Ghana" revealed that a strong commitment and ownership had been developed in the villages. However, at medium- to long-term this commitment may fade away if the challenges of poverty, socio-economic changes and climate change are not addressed and communities are left alone. The worthiness of the project outcomes justifies a continuation of engagement, to support the demonstration / pilot communities and involving the experienced community representatives in scaling-up the activities to other regions of the country – and even neighbouring countries.

Example of low- to none-impact

In the case of the project support to Indonesia the outcomes in principle generated high-value results (fire extent and damage assessment, methods of post-fire rehabilitation, development of national fire management guidelines), but limited impacts. The regional environmental crisis generated by application of fire in land-use change in 1982-83 and in a larger extent in 1997-98, could not be halted despite high investments and projects. These investments had aimed at supporting the country to building governance in safeguarding and protecting forests and other vegetated lands, including peatland biomes, as well as the natural and human environment against the adverse impacts of fire use and wildfires. However, in late 2015 the fire situation resembles the situation in 1997-98 and the years after during which continuing burning of native vegetation resulted in severe environmental damages and affected human health and security.

In other words: Despite of high national and international investments the overall situation did not change. The fire suppression organization and capacities had been set up at provincial and district level during the last decade could not halt or mitigate the main problems arising from the excessive application of fire in land use and land-use change.

It is 18 years ago when Indonesia asked for international assistance in fighting fires, which resulted in international response by delivery of equipment and dispatch of fire aviation – although it was already clear at that time that spending financial resources for "firefighting" would not affect the land-use fires and its

consequences. The burning of native vegetation, including peat lands, has been and will continue to be wilful, targeted, although not in compliance with the law. The same is happening again in 2015: The country is demanding and the international community sending firefighting airplanes despite of the fact that – apart of a political gesture of solidarity – these investments are useless.

The lesson identified is that the lessons of the 1980s and 1990s were not learned, and that scientific and technical support over the last two decades did not impact the governance of handling a creeping environmental disaster with global significance.[1]

The role of national support organizations to grant sustainability of project outcomes

One of the explanations that the projects implemented in Ghana have been successful and enduring is the involvement and *modus operandi* of implementing partners. Within the cooperation between the CSRI Forestry Research Institute of Ghana (FORIG) and the Resource Management Support Centre (RMSC) in Kumasi the involved scientists granted continuity and gradually increasing and cumulating scientific and technical expertise. The smooth and continuing cooperation with the Ghana Forestry Commission allowed efficient and effective outreach. Future investments in scaling-up fire management capacity building in the country should depend on and likely be granted by this inter-institutional setting. The inclusion of local communities in furthering outreach work and upscaling of the project approach to other regions remains a demanding challenge.

The performance of the donor / support organization

The review / assessment of the projects completed within a thematic project cluster reveals that the organizations – and finally the supported member countries – have benefitted from an increasing experience through active project involvement of the support organization, i.e. the ITTO. This has resulted in increasingly enhanced institutional knowledge of principles and approaches in fire management, and thus allowing competent targeted support services to its clients. The concepts and designs of the projects launched in Latin America, Africa and Asia reflect advanced approaches in fire management, notably by prioritizing the involvement of civil society.[2]

In addition the ITTO has become involved in the global cooperative work in fire management, notably through its active membership in the UNISDR Wildland Fire Advisory Group (WFAG) and the Global Wildland Fire Network (GWFN), and the close cooperation with the WFAG/GWFN Secretariat, the Global Fire Monitoring Center (GFMC). Furthermore the ITTO is member of the International Liaison Committee (ILC) of the International Wildland Fire Conferences. Most recently the ITTO played a crucial role in supporting its member producer countries in the preparation and successful outcomes of the 6th International Wildland Fire Conference, which was held in Republic of Korea, 12-16 October 2015. This international involvement ensures reciprocal exchange of knowledge and expertise in fire management principles and approaches globally, thus ensuring that the ITTO-supported projects build on the state-of-the art knowledge and the heritage of experiences on fire management globally.

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[1] Goldammer, J. G. 2006. History of equatorial vegetation fires and fire research in Southeast Asia before the 1997-98 episode. A reconstruction of creeping environmental changes. Special Issue: Mitigation and Adaptation Strategies for Global Change 12, 13-32. DOI: 10.1007/s11027-006-9044-7.

[2] Apart of this report see
- Organization of the "International Cross Sectoral Forum on Forest Fire Management in South East Asia" (1998): http://www.fire.uni-freiburg.de/programmes/itto/cross.pdf
- The Mission on Forest Fire Prevention and Management to Indonesia and Malaysia (Sarawak) (1998): http://www.fire.uni-freiburg.de/programmes/itto/itto%20mission.pdf
- ITTC Decision 6 (XXXIII) http://www.fire.uni-freiburg.de/programmes/itto/E-C33-27.D6-short.pdf
- ITTO "Fire Alarm" (2009): http://www.fire.uni-freiburg.de/programmes/itto/ITTO-Fire-Alarm-2009.pdf
- ITTC Report CRF(XLIII)/6, 13 November 2009: http://www.fire.uni-freiburg.de/programmes/itto/ITTO-43-Session-Report-13-Nov-2009.pdf
- ITTO Tropical Forest Update Vol. 24, No.2 (2015): http://www.itto.int/tfu/id=4461
- ITTO Special Event at the 6th International Wildland Fire Conference (Pyeongchang, Republic of Korea, 12-16 October 2015): http://www.fire.uni-freiburg.de/korea-2015/Files-Korea-2015/Agendas/Side-Event-ITTO-Flyer.pdf

6.   Recommendations

As requested by the terms of reference of the Assessment Mission the recommendations are addressed as follows:

6.1   The needs, objectives and approaches for similar projects in the future

The White Paper "Vegetation Fires and Global Change – Challenges for Concerted International Action", which was published in 2013 and directed to the United Nations and International Organizations, reveals the problems and challenges on the role and response to fire management at global level in the near future.[3] The outcomes of the 6th International Wildland Fire Conference, which was held in Republic of Korea, 12-16 October 2015, point into the same directions and confirm the views of scientists, practitioners and policy makers in a concise, targeted recommendation and call for action in the "Pyeongchang Declaration".[4]

The conference recommended two tiers of international response, which may serve as guidance for the ITTO to continue and expand its contribution in building fire management capacities in its member producer countries:

- **International policies and concerted action**: Collective international efforts are needed to address impacts of vegetation fires that are of transboundary nature and currently affecting at an unacceptable level common global assets such as atmosphere and climate, natural and cultural heritage, and human health and security. Systematic application of principles of Integrated Fire Management (IFM), based on the wealth of traditional expertise and advanced fire science, contributes to sustainable land management, ecosystem stability and productivity, maintenance and increase of terrestrial carbon stocks, and reduction of unnecessary emissions of pollutants that affect human health and contribute to climate change. The COP 21 is encouraged to acknowledge the role and endorse the support of IFM as an accountable contribution to reduce greenhouse gas emissions, maintain or increase terrestrial carbon pools in all vegetation types and ensure ecosystem functioning.

- **Capacitation of nations to address the challenges in fire management**: In order to implement IFM there is a demand for capacity building, investments and outreach work at global level. Since traditional and advanced knowledge of IFM principles is available for all vegetation types, the systematic application of IFM, notably community-based fire management approaches, could be promoted by exchange of expertise between countries. The development of regional programmes and / or resource centres for capacity building including training in fire management should be supported by countries and international organizations. Bilateral agreements and multilateral voluntary exchange instruments should also be supported.

6.2   Appropriate target groups

Fires are interacting between open natural landscapes, agricultural lands, pasture lands, forests, protected areas and human settlements (individual farmstead, villages and even urban fringes). The experience gained within the evaluated projects as well as elsewhere at international level reveals the need to address fire management across the natural, cultural and administrative landscapes by developing a holistic approach.

Thus, any project planning and involvement of potential project partners must include the various government agencies / institutions responsible for agriculture, forestry, conservation, public health etc., as well as non-governmental organizations and representatives of civil society including local communities. Permanent national, regional and local Fire Management Round Tables or Committees would ensure participatory approach and coordinated sharing of responsibilities.

In the ideal case three approaches would provide the desired results:

- The *Top Down Approach* would formulate the national interest in building sustainable fire management capacities by developing – if not yet in place – an inter-agency mechanism (including participation of civil

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[3] Goldammer, J.G. (ed.) 2013. Vegetation Fires and Global Change – Challenges for Concerted International Action. A White Paper directed to the United Nations and International Organizations. Kessel Publishing, 398 p. (ISBN 978-3-941300-78-1). http://www.forestrybooks.com/ and http://www.fire.uni-freiburg.de/latestnews/recent_pub.htm

[4] For the outcomes of the conference, including the Pyeongchang Declaration "Fire Management and Sustainable Development" and the more detailed Conference Statement and the Statements of the Regional Wildland Fire Networks see: http://www.fire.uni-freiburg.de/korea-2015.html

society), developing (or reviewing) a national fire management policy, an implementation strategy and an action plan
- The *Bottom Up Approach* would secure the identification and testing of fire management options that may vary from region to region considering the environmental, cultural and socio-economic peculiarities
- The *Horizontal Approach* would involve local communities and administrations of pilot / demonstration (project) areas to upscale the tested fire management solutions to other regions of the countries, i.e. the exchange of expertise between local communities. The involvement of trained community members / volunteers would provide motivation, acceptance and some income for the most often economically disadvantaged target groups. The costs for "horizontal" exchange and training approaches are substantially less than involving international trainers. Experience in this kind of horizontal exchange and training has been proven by experience in Nepal.[5]

Considering that wildfires and fire-generated smoke pollution often cross national borders, projects should also address "transboundary" or "cross-boundary" fire management approaches, i.e. concepts of addressing fire management along and across national borders. This will require the development of legal bilateral agreements. Bilateral or sometimes multilateral approaches in fire management should envisage exchanging expertise and thus taking benefit from experience of the neighbour country. Finally joint border-crossing projects would constitute the basis for developing interoperability between countries to be prepared for mutual assistance in wildfire emergencies.

6.3   From projects to processes

The evaluation of the ITTO projects and the general experience of the GFMC in handling fire management projects globally revealed that in most cases a single fire management project may not result in satisfying results concerning sustainability, efficiency and effectiveness of individual project approaches.

An important lesson identified over the last years is that the traditional approach by international actors to tackle development issues by time- and budget-limited projects, often working with partners in governmental institutions in which a regular turnover of personnel may result in a rather weak institutional memory with regards to project heritage, may need to be replaced by an approach to support a process at medium- to long-term time scales. If traditional structures and mandates of international organizations will not allow to cater and support long-term process approaches it would be worth to seek an active involvement of dedicated (thematic) networks and institutions such as the Global Wildland Fire Network with its 14 Regional Wildland Fire Networks, investigate the utility to establish dedicated regional centers of excellence and liaise with the voluntary arrangements under the International Wildfire Preparedness Mechanism (IWPM).

Development of regional fire management centers

In other regions of the world the establishment of "Regional Fire Management Resource Centers" has proven to be successful. Such centers are serving as

- Repository of regional / country data and scientific and technical information on wildland fire, including expertise of past projects and programmes (online and physically in the center)
- Training facility for professionals and volunteers in fire management in individual countries and in collaborative arrangements at regional / multinational level
- Distributor of information to the actors in fire management, but also to the public, on wildfire prevention, early warning and real-time information for ongoing wildfires
- Facilitator of mutual support between neighbouring regions in wildfire emergency situations

The three existing centers in Southeast Europe / Caucasus, Eastern Europe and Central Asia are based at universities and have strong ties into the government systems of the participating countries. The reason for this is the general long-term involvement of researchers / university professors in fire ecology and fire management research and their dedication to work at thee interface with practitioners, administrations and at the policy-making level.

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[5] http://www.fire.uni-freiburg.de/GlobalNetworks/South_Asia/Meetings_activities/Southasia-Panasia_Consultation.html

6.4   Should the ITTO Guidelines on Fire Management in Tropical Forests (1997) be reviewed and/or enhanced?

During the last 20 years a number of fire management guidelines have been developed for various target groups and at various scales / levels (international / global, national, local; thematic).[6]

The following guidelines are exemplary and listed by sequence of publication date and provide rationale for the recommendation to the ITTO:

6.4.1   International / Global Guidelines

ITTO Guidelines on Fire Management in Tropical Forests (1997)

The guidelines have been developed under the impression of accelerating destruction of tropical forests by land-use fires and wildfires in the 1980s and 1990s. In principle the guidelines are addressing tropical forests but had served as example and guidance for other (eco-) regions of the world. In the 1990s the human influences and climate variability (e.g., El Niño / Southern Oscillation) were in the focus. The guidelines give emphasis on community participation in fire management – and in this regard were pioneering and are still valid.[7]

WHO Health Guidelines for Vegetation Fire Events (1999)

The World Health Organization (WHO) in cooperation with GFMC, WMO and UNEP published guidelines together with a volume with background papers and a teacher's guide. The volumes aim at contributing to prevent and manage disasters caused by smoke from vegetation fires and to mitigate their effects on human health.[8]

Fire Management Voluntary Guidelines (2006)

The guidelines outline principles and strategic actions necessary for policy, planning and senior management decision makers to achieve more integrated and cross sectoral approaches to fire management. The guidelines have a general character and include all aspects of fire management and reflect the progress in interdisciplinary character of approaches in fire management, contributions by the members of the drafting team, i.e. the representatives of the Global Wildland Fire Network.[9]

6.4.2   National Guidelines and Policies

There are only a few fire management guidelines in place that were developed for the targeted national use. Two examples are given:

Indonesia

As elaborated in sections 3.5 and 5 of this report the project "Integrated Forest Fire Management in Indonesia - Phase I: National Guidelines on the Protection of Tropical Forests against Fire", despite of resulting a high-quality set of national guidelines, had limited to none impact on the overall fire situation in the country. The fire suppression organization and capacities had been set up at provincial and district level during the last decade could not halt or mitigate the main problems arising from the excessive application of fire in land use and land-use change.

Namibia

Only one country, which is not a member state of the ITTO, has developed national guidelines that were based on the ITTO Guidelines on Fire Management in Tropical Forests. The guidelines endorsed by the Government of Namibia in 2001 are very detailed, mirror the ITTO Guidelines on Fire Management in Tropical Forests and have resulted in significant advances in fire management in the country.[10]

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[6] A GFMC web page provides access to major international guidelines: http://www.fire.uni-freiburg.de/literature/Fire-Management.htm
[7] http://www.itto.int/policypapers_guidelines/
[8] http://www.fire.uni-freiburg.de/programmes/un/who/who.html
[9] http://www.fao.org/docrep/009/j9255e/j9255e00.htm
[10] http://www.fire.uni-freiburg.de/iffn/country/na/na_8.htm

Ghana

Ghana is one of the few ITTO member counties and even globally in which a national fire management policy has been enacted. The *National Wildfire Management Policy* of 2006, which was developed in partnership between the ITTO project "Fire-Management and Post-Fire Restoration with Local Community Collaboration in Ghana" and a project funded by the Government of the Netherlands, reflects the state-of-the-art of fire management approaches in tropical countries.[11]

6.4.3 Local Guidelines

In many regions globally rural settlements (villages, towns, scattered farmsteads) and other rural assets (agricultural fields / crops, infrastructures and other values at risk), which are threatened by wildfires, are located far away from urban and municipal centers with their authorities, infrastructures and capabilities to deliver fire protection services.

While the aforementioned national and international guidelines all address the importance of community participation in fire management there is a need for producing concrete guidelines that can be understood and used by local communities. Educational and other outreach materials have been produced by all evaluated ITTO projects.

The "Guidelines for Rural Populations, Local Communities and Municipality Leaders in the Balkan Region for the Defense of Villages, Farms and Other Rural Assets against Wildfires" are another example which merits to be reviewed for adaptation and application for tropical rural communities as deemed appropriate. These guidelines have been developed in order to enhance the capabilities of local rural communities, farmers and herders to defend themselves against wildfires.[12]

6.4.4 Technical Guidelines

Finally technical guidelines provide the necessary in-depth detail for fire management methods. The "Guidelines and Manual of Procedures for Community-Based Fire Management" developed in Ghana are a good example for this kind of resources.[13] Other handbooks that are useful for tropical countries are available on the GFMC repository, e.g. the "Handbook for Trainers"[14] or the Wildland Fire Management Handbook for Subsahara Africa.[15]

6.4.5 Need for complementary Guidelines

By addressing the question of the ITTO Guidelines on Fire Management in Tropical Forests (1997) should be reviewed and/or enhanced it is recommended to consider the guidelines as pioneering and still valid. During the almost two decades since the publication of the ITTO guidelines other guidelines addressing a more global level, or guidelines of exemplary utility for national or local application, have been developed and are complementary.

Thus, it is suggested to retain the guidelines as they are and recommend application in concert with other above-mentioned examples.

However, it seems that there is a need for a more detailed technical guidelines document that would address the issue of climate change and the fate and future of tropical forests.

With reference to Section 6.1 of the report and the quoted Pyeongchang Declaration "Fire Management and Sustainable Development" it is proposed to call for a consultation of an interdisciplinary team of experts, including those who have been involved in developing principles for the UNFCCC REDD process[16] and carbon abatement projects, e.g. the "International Savanna Fire Management Initiative"[17] and related projects.[18]

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[11] http://www.fire.uni-freiburg.de/intro/2015/update-1054/Ghana-Wildfire-Policy-2006.pdf
[12] http://www.fire.uni-freiburg.de/Manag/CBFiM_11.htm
[13] http://www.fire.uni-freiburg.de/intro/2015/update-1055/ITTO-Community-Fire-Management-Guidelines-Ghana-2011.pdf
[14] http://www.fire.uni-freiburg.de/literature/Fire-Management-Handbook-2007.pdf
[15] http://www.fire.uni-freiburg.de/latestnews/GFMC-Wildland-Fire-Management-Handbook-Sub-Sahara-Africa-2004.pdf
[16] See REDD Sourcebook "Reducing greenhouse gas emissions from deforestation and degradation in developing countries. A sourcebook of methods and procedures for monitoring measuring and reporting": http://www.gofcgold.wur.nl/redd/
[17] http://tfm.unu.edu/

7. Summary

The history of response of ITTO to the accelerating problems of fire use and wildfires in tropical forests goes back to the 1980s and shows an increasing involvement by addressing basics, i.e. assessment of damages, development of options for rehabilitation of fire-damaged forests and development of national and international guidelines on fire management. Based on these experiences and the collective advances in fire management during the 1990s and the early 2000s the ITTO has supported a number of member countries in building fire management capacities. Furthermore, the ITTO has supported its member countries in the participation in the efforts to enhance international cooperation in fire management.

The assessment of the projects supported by the ITTO reveals that – based on the insight and experience gained over the past two decades – the organization may consider continuing its involvement and prioritizing investments and supporting in furthering capacity building in fire management in its member states.

ITTO projects have established models to support the building of national-to-local fire management capabilities in several ITTO member countries in Africa, Asia and Latin America. National and international fire management guidelines have helped in developing concepts, policies and implementation strategies in fire management. The development of national fire management policies, associated with legal frameworks and implementation strategies, is now at the top of the agendas of many countries.

The exchange of experiences between neighbouring countries through Regional Wildland Fire Networks is receiving increasing attention. Among other these networks aim to increase capacity in both the public and private sectors by sharing expertise in fire management and the development of fire management policies. At the end of 2015 three regional fire management resource centres have been established in the Southeast Europe/Caucasus region, Eastern Europe and Central Asia and serve as repositories of data, information and knowledge, and facilitate the exchange and sharing of fire management expertise between countries. **The utility of such regional centers for tropical Latin America, Africa and Asia should be considered.** This could allow ITTO and its member states to move from sponsoring time- and efficiency-restricted project series towards supporting processes that would become sustainable and self-sufficient over time.

In the future, ITTO may also consider supporting cross-boundary and regional cooperation in fire management. Bilateral and multilateral cross-boundary cooperation in response to wildfire emergencies could also be enhanced through active participation in the International Wildfire Preparedness Mechanism (IWPM), which constitutes an additional toolbox for capacitating countries in wildfire emergency preparedness and creating efficient and safe interoperability in managing wildfire crises by cross-boundary cooperation.

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[18] http://www.fishriver.com.au/ or http://theconversation.com/savanna-burning-carbon-pays-for-conservation-in-northern-australia-12185 or http://www.klc.org.au/docs/default-source/Resources/feasibility-report-savanna-fire-management-for-native-title-holders-in-t?sfvrsn=0