International cooperation in wildland fire management

J.G. Goldammer

Recognizing that impacts of wildland fires are not limited by national borders, international and regional agencies, non-governmental institutions, governments and civil society are harmonizing efforts to reduce the negative consequences of wildfires.

Over the past decade, many regions of the world have witnessed a growing trend of excessive fire application in land-use systems and land-use change and an increasing occurrence of wildfires of extreme severity. Some of the effects of wildland fires cross borders, for example smoke pollution and its impacts on human health and safety, loss of biodiversity or site degradation at the landscape level leading to desertification or flooding. The depletion of terrestrial carbon by fires burning under extreme conditions in some vegetation types, including organic terrain in peatland biomes, is one of the driving agents of disturbance of global biogeochemical cycles, notably the global carbon cycle. This trend is stirring the international community to address the problem collaboratively. The development of informal partnerships, joint projects and formal agreements between government and non-governmental institutions is essential to enable nations to develop sustainable fire management capabilities.

"Given that fire is also an important natural process in many ecosystems, and that people have traditionally used fire for millennia as a land-management tool, the challenge is to develop informed policy that recognizes both the beneficial and traditional roles of fire, while reducing the incidence and extent of uncontrolled burning and its adverse impacts."

Working Group on Wildland Fire, 2003

Several agencies and programmes of the United Nations system work on problems related to wildland fire management:

- FAO: sustainable forest management, fire management and community involvement;
- Office for the Coordination of Humanitarian Affairs (OCHA): coordination of international response to wildland fire emergencies;
- United Nations Environment Programme (UNEP): environmental impact assessment of vegetation fires, early warning and monitoring;
- World Health Organization (WHO): protection of human health against adverse effects of vegetation fire, smoke pollution;
- World Meteorological Organization (WMO): early warning of precursors leading to critical fire situations.

In addition, several global conventions are mandated to protect global vegetation cover and ecosystem functioning, i.e. the Convention on Biological Diversity (CBD), the Convention to Combat Desertification (UNCCD), the Ramsar Convention and the Framework Convention on Climate Change (UNFCCC).

Given the diversity of sectoral responsibilities within the UN system, an inter-agency Working Group on Wildland Fire was established in 2001 to facilitate a common policy dialogue. The working group was set up within the Inter-Agency Task Force for Disaster Reduction under the United Nations International Strategy for Disaster Reduction (ISDR).

However, UN agencies alone cannot meet all the needs for assistance and technology transfer to promote sustainable fire management in developing countries. Support from governments and non-governmental organizations, including bilateral and multilateral cooperative efforts, is crucial.

This article describes both the role of international and regional collaborative efforts and the role of governments and civil society in reducing the negative impacts of fire on people and the environment.

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WHY IS INTERNATIONAL COOPERATION NEEDED?

Both the causes and the effects of damaging wildland fires are determined by social, economic and natural factors that differ among the regions and countries of the world. Many regions suffer too much fire; other ecosystems or landscapes are threatened by lack of fire or by change of land use indirectly resulting in changes in fire regimes.

On the other hand, wildland fire has certain common issues and transboundary effects. Near-ground smoke pollution, for example, adversely affects human health and security at local to regional levels. Vegetation fire emissions also determine the composition and functioning of the global atmosphere. Secondary disasters triggered by excessive wildland fires also often cross national borders. These include destabilization of ecosystem functioning at landscape level, floods, loss of biodiversity, savannization and even desertification. Thus, wildland fire can have impacts on multiple nations and even the global community.

One way to develop informed policy is to formulate the wildland fire problems within the regions and synthesize them at the global level. Quantification of the impacts of wildland fire at planetary level is needed in order to understand the role of wildland fire in global change processes. Accurate and timely information is needed on the number of fires, area burned and phytomass consumed annually at national, regional and global scales, and on the social, economic and environmental costs. Only then can a harmonized policy be developed that considers the multidirectional effects of fire.

INTERNATIONAL WILDLAND FIRE SUMMIT: SHORT- TO MEDIUM-TERM SOLUTIONS

The World Summit for Sustainable Development (WSSD) (Johannesburg, South Africa, 2002) provided the groundwork for the development of an action programme to reduce the negative effects of wildland fires on environment and humanity. Consequently, an International Wildland Fire Summit was held in Sydney, Australia in October 2003 (immediately following the third International Wildland Fire Conference). The theme of the summit was "Fire Management and Sustainable Development: Strengthening International Cooperation to Reduce the Negative Impacts of Fire on Humanity and the Global Environment".

The summit theme was selected to underscore the need to address the increasing vulnerability of ecosystems and human populations to uncontrolled wildland fires as well as the inappropriate or excessive application of fire in modifying vegetation cover. High priority was given to defining solutions and to enhancing international cooperation in the arena of wildland fire management.

The summit recognized that solutions must be based on practical and realizable approaches and instruments leading to common strategies, frameworks for implementation and financing mechanisms. Most crucial is the development of mechanisms that will result in concrete action, including both informal and formal agreements at the bilateral and international levels. The agreed

Fuel loads in forests influence fire intensity

Low- to medium-intensity surface fires burning in regular intervals in northern coniferous forests (as illustrated in Siberia, Russian Federation) contribute to the cyclic reduction of fuel loads without damaging the timber (left). Mature fire-maintained forests also provide habitats for wildlife and endangered plant and animal species. Exclusion of natural and human-caused fires over long periods may lead to accumulation of fuels which – when inevitably ignited – will result in fires of high intensity (right). These fires have quite different impacts from low-intensity fires and result in high economic and ecological losses (stand destruction, secondary pests, loss of habitats).

GFCM

"Strategy for Future Development of International Cooperation in Wildland Fire Management" provided a number of recommendations aimed at harmonization and standardization of approaches and enhanced international cooperation. Two of the summit's outputs are particularly practical and ready for implementation:

- an international agreement template which can be used by agencies wishing to form a cooperative or mutual aid arrangement with one or more other countries for cooperation in wildland fire management;
- agreement that an Incident Command System (ICS) should become the international standard for wildland incident management in international or interagency agreements and exchanges.

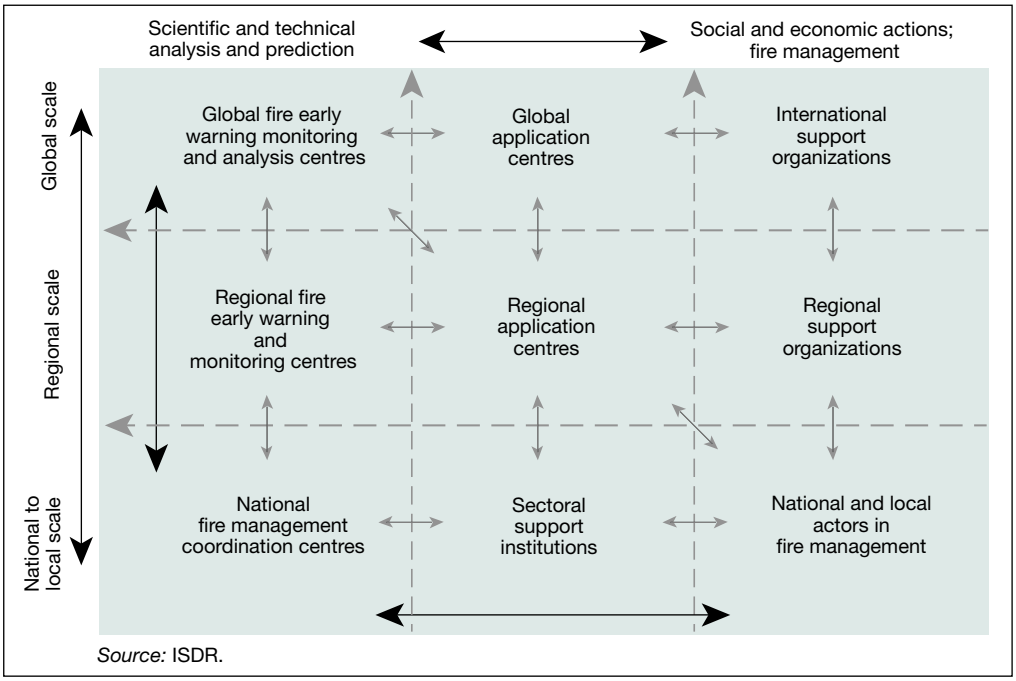
GLOBAL AND REGIONAL WILDLAND FIRE NETWORKS

A priority area of the ISDR Working Group on Wildland Fire was the establishment of the Global Wildland Fire Network, aimed at enhancing existing capabilities in fire monitoring, early warning and impact assessment, and facilitating international cooperation in fire management (Figure 1).

The International Wildland Fire Summit endorsed the global network as a means of consolidating, developing and promoting the work of the Regional Wildland Fire Networks through active networking in information sharing, capacity building and preparation of bilateral and multilateral agreements. This process will be facilitated through regional wildland fire conferences and summits in cooperation with an International Liaison Committee.

It was planned that at the end of its mandate in late 2003, the Working Group on Wildland Fire would be transferred into the Global Wildland Fire Network as an active outreach programme. To support the work of the global network, a Wildland Fire Advisory Group would be created under the auspices of ISDR. The advisory group will call for participation and support from UN agencies and programmes, other international organizations, non-governmental organizations (NGOs), government agencies, intergovernmental institutions and agreements, civil society, academia, the International Liaison Committee of the series of international conferences on wildland fire and the Global Fire Monitoring Center (GFMC). On behalf of ISDR, GFMC is acting as the global network's convener and secretariat, supporting the establishment of Regional Wildland Fire Networks and facilitating cooperative efforts with existing bodies, including FAO and others such as:

- UN-mandated regional teams: the ISDR Wildland Fire Advisory Group, the Economic Commission for Europe (ECE)/FAO/International Labour Organization (ILO) Team of Specialists on Forest Fire, the Fire Management Working Group of FAO's North American Forest Commission and the Forest Fire Group of the Committee



Source: ISDR.

1
The role of the Global Wildland Fire Network in collection and dissemination of local to global wildland fire information for development of informed policy and decision support

The Global Wildland Fire Network – status in early 2004

Regional Subsahara Africa Wildland Fire Network: **Launched in 2002; special focus: Africa Wildland Fire Training Center**

Regional South East Asia Wildland Fire Network: **Core agreement: ASEAN Agreement on Transboundary Haze Pollution (signed in 2002, entered into force in 2003)**

Regional North East Asia Wildland Fire Network: **Launched in 2004; facilitator: the Korean Forest Research Institute**

Regional South Asia Wildland Fire Network: **To be discussed in 2004-2005**

Regional Central Asia Wildland Fire Network: **Launched in 2004 by ECE/FAO/ILO Team of Specialists on Forest Fire**

Regional Australasia Wildland Fire Network: **Implemented since 1996 by the Australasian Fire Authorities Council**

Regional Mediterranean Wildland Fire Network: **Gradually being implemented through the Forest Fire Group within *Silva Mediterranea***

Regional Balkan Wildland Fire Network: **Initiated in 2002 with core activity facilitated by Bulgaria**

Regional Baltic Wildland Fire Network: **Founded by the ECE/FAO/ILO Team of Specialists on Forest Fire at the Baltic Exercise for Fire Information and Resources Exchange in 2000; consolidated by a regional meeting in 2004**

Regional Mesoamerica Wildland Fire Network: **Launched in 2002 by the First Mesoamerican Meeting on Forest Fire Protection; facilitated by Guatemala**

Regional South America Wildland Fire Network: **Launched in 2004 in preparation for the Western Hemisphere wildland fire conference to be held by FAO's North American Forest Commission and Latin American and Caribbean Forestry Commission in Costa Rica, October 2004**

Regional North America Wildland Fire Network: **Led by the Fire Management Working Group of the FAO North American Forest Commission, established in 1962**

Source: **Web site of the Global Wildland Fire Network: www.fire.uni-freiburg.de/GlobalNetworks/globalNet.html**

on Mediterranean Forestry Questions – *Silva Mediterranea* (which is a committee of FAO's African Forestry and Wildlife Commission, European Forestry Commission and Near East Forestry Commission);

- the Global Observation of Forest Cover – Global Observation of Landcover Dynamics (GOFC-GOLD) Fire Implementation Teams (a subset of the Global Terrestrial Observing System);
- the Advisory Group on Environmental Emergencies and the Joint Environment Unit of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the United Nations Environment Programme (UNEP).

The Regional Wildland Fire Networks (see Box and Figure 2) may consist of focused subnetworks or may be complemented by any other topical network. Harmonization of objectives and efforts with other independent networks is desired. The GOFC-GOLD regional Fire Implementation Teams will have a key role in the formation and operational functioning of wildland fire monitoring networks.

Independent regional initiatives that were already in place have been contacted and encouraged to become connected to the Global Wildland Fire Network. Activities are being initiated in those regions where no such regional efforts were in place.

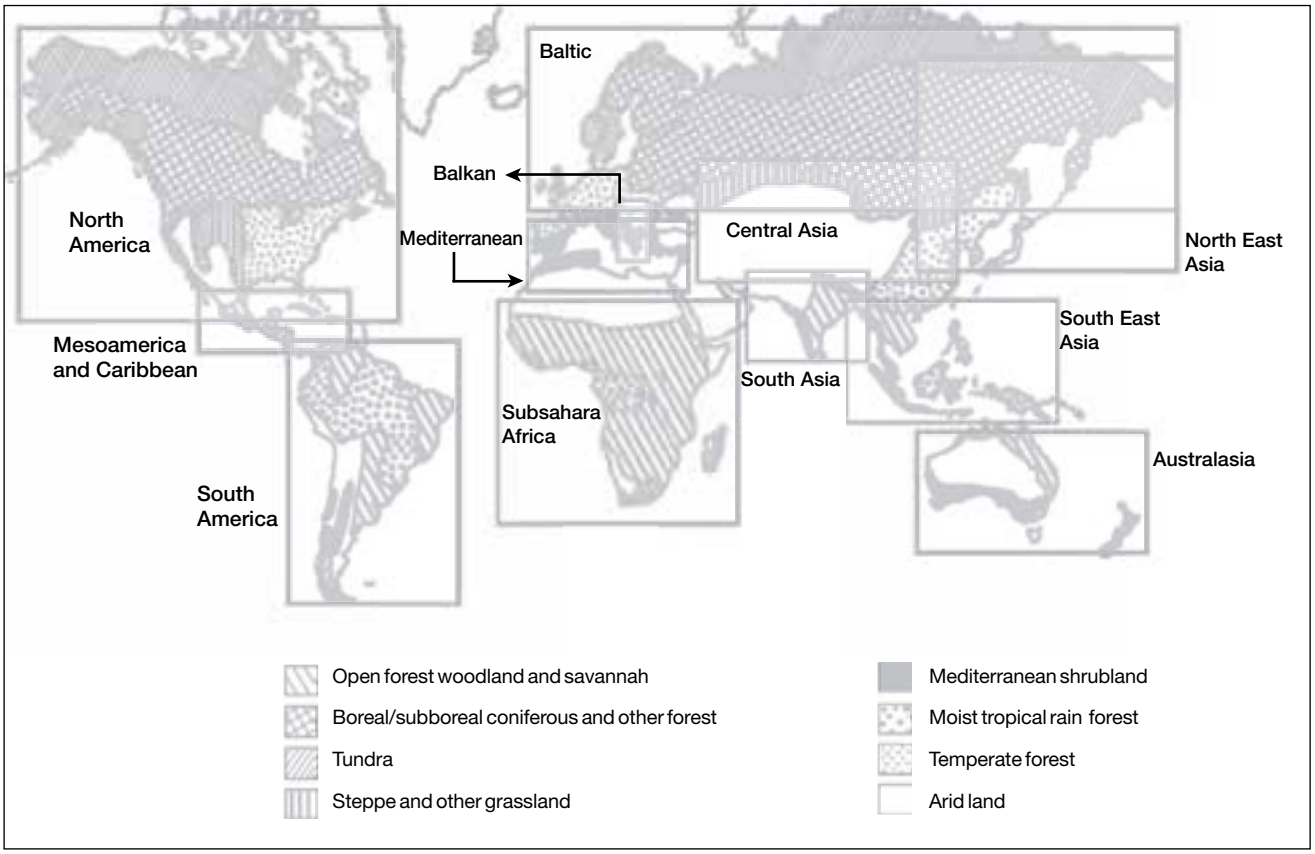
MOVING THE INTERREGIONAL AND GLOBAL DIALOGUE FORWARD: PERSPECTIVES AND CHALLENGES

Short- to medium-term perspectives

The following events directed towards implementing the recommendations of the International Wildland Fire Summit, enhancing the international dialogue, building informal and formal partnerships and activating the Global Wildland Fire Network will take place within the near future.

- A series of consultations in the framework of the Regional Wildland Fire Networks has been initiated in Northeast Asia (March 2004), the Baltic Region (May 2004), sub-Saharan Africa (June 2004), South America (June 2004) and Mesoamerica (second half of 2004). These consultations will seek to define critical issues in the regions and identify priority issues to be addressed by regional cooperative efforts.
- A Western Hemisphere wildland fire

2
Delineation of regions within the Global Wildland Fire Network



conference is scheduled for October 2004 in Costa Rica. On this occasion the heads of forestry agencies will be invited by FAO's North American Forest Commission and Latin American and Caribbean Forestry Commission to express their views on needs and opportunities in wildland fire management cooperation in the Americas.

- A number of international wildland fire management training courses and workshops will be conducted in the regions – for example, a first workshop has been conducted in Africa jointly by GFMC, the Regional Subsahara Africa Wildland Fire Network, FAO, OCHA, UNEP and United Nations University; this workshop was a pilot for other regions.
- A ministerial meeting to be held in conjunction with the seventeenth session of the FAO Committee on Forestry (COFO) in Rome in March 2005 will address international cooperation to prevent and control forest fires. This meeting will have an important role in bringing forward the recommendations from regional consultations in 2003 and 2004.
- A Global Forest Fire Assessment 2005 will be conducted jointly by FAO, GFMC and GOFC-GOLD.

Long-term perspectives

In the long term, programmes will need to be developed to address, among others, the following key issues:

- common methodologies for assessing wildland fire impacts (standards for wildland fire inventories and statistics, common algorithms for application of remote-sensing tools);
- regular national wildland fire impact assessments as part of global wildland fire inventories;
- standards for economic damage assessments;
- the role of sustainable vegetation fire management in the carbon-trading market;
- wildland fire mitigation strategies and methodologies for urban interface areas in industrialized countries, including education;
- enabling legislation and institutional

strengthening for sustainable fire management in developing countries;
- enhancing capabilities of local communities in fire preparedness, prevention, suppression and rehabilitation of burned areas;
- providing advanced high-level training in cooperative wildland fire management at the international level through the United Nations University Institute for Environment and Human Security.

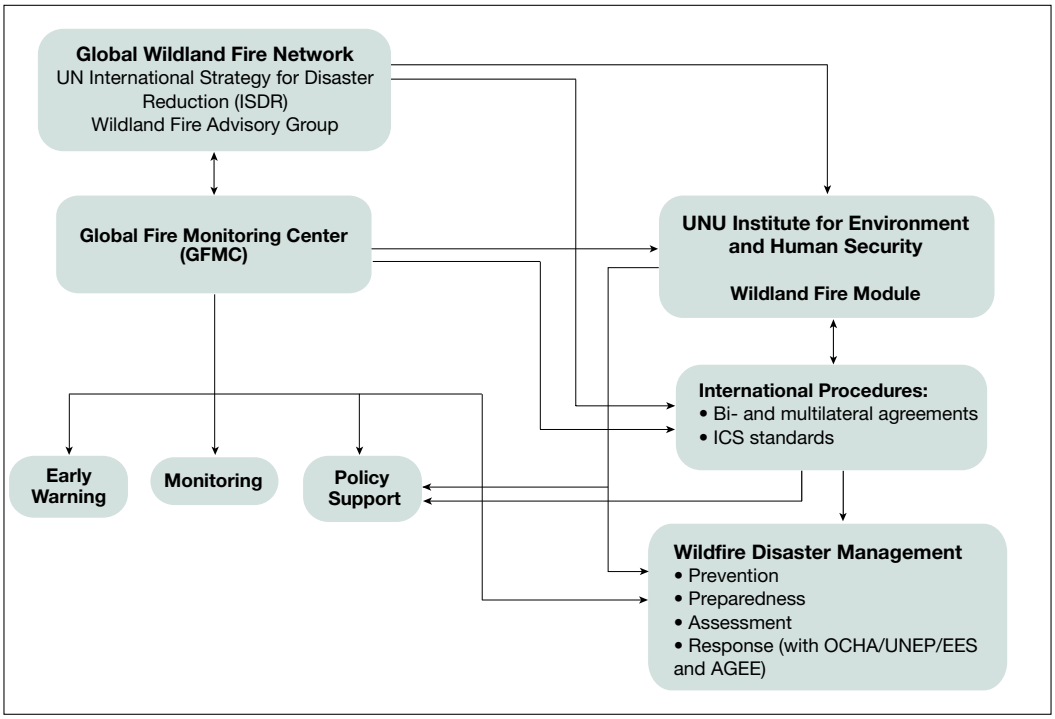
To achieve these goals it is essential that formal and informal arrangements work hand in hand. Figure 3 shows an example of a cooperative arrangement for the implementation of strategic recommendations elaborated by the International Wildland Fire Summit. ISDR will continue to coordinate action among United Nations agencies, programmes and conventions and will be supported by the Wildland Fire Advisory Group.

INTERNATIONAL COOPERATION AT THE OPERATIONAL LEVEL

A large number of bilateral and multilateral projects have supported wildland fire management capacities throughout the world. Their experiences provide examples of practical solutions for cooperative work at the operational level.

There has also been encouraging cooperation between countries and international organizations during emergency situations in which national fire suppression capacities were insufficient or exhausted. The following are some examples.
- North America: Firefighting resources have been repeatedly exchanged between the United States, Canada and Mexico.
- United States-Australia-New Zealand: The common use of the Incident Command System (ICS) has allowed the exchange of firefighting personnel between the three countries since 2000.
- Europe: During the extreme fire season of 2003 in the western Mediterranean region, fire suppression forces from European countries were sent to Portugal and France.
- Africa: The international community was involved in managing the wildland fire emergency in Ethiopia in 2000.
- Southeast Asia: Malaysian teams and international experts were sent to Indonesia in 1997-1998, and international assistance to Viet Nam in 2002.

Informal agreements are usually bilateral, and often involve civil society. Projects designed and implemented by NGOs have an increasingly important role; examples include the World Conservation Union (IUCN)/Worldwide Fund for Nature (WWF) Project FireFight South East Asia and the Learning



3
Model of cooperative arrangements between the Global Wildland Fire Network und the United Nations University for high-level capacity building in wildland fire management

Links: Web sites related to international cooperation on wildland fire

ECE/FAO *International Forest Fire News*: www.fire.uni-freiburg.de/iffn/iffn.htm

FAO *Global Forest Fire Assessment 1990-2000*: www.fao.org/DOCREP/006/AD653E/AD653E00.HTM

FAO Forest fires site: www.fao.org/forestry/site/14050/en

FAO summary, "Forests and fire": www.fao.org/forestry/site/11481/en

Global Fire Monitoring Center (GFMC): www.fire.uni-freiburg.de

Global Observation of Forest Cover/Global Observation of Landcover Dynamics (GOFC/GOLD) Fire Mapping and Monitoring: gofc-fire.umd.edu

Global Wildland Fire Network: www.fire.uni-freiburg.de/GlobalNetworks/globalNet.html

International Tropical Timber Organization (ITTO) Wildland Fire sites: www.itto.or.jp/live/index.jsp; see www.fire.uni-freiburg.de/programmes/itto/itto_start.htm

International Wildland Fire Summit: www.fire.uni-freiburg.de/summit-2003/introduction.htm

ISDR Wildland Fire Advisory Group: www.unisdr.org/eng/task%20force/tf-working-groups4-eng.htm

Joint UNEP/OCHA Environment Unit/WSSD Partnership for Environmental Emergencies: www.reliefweb.int/ochaunep; www.reliefweb.int/ochaunep/tools/wssd.htm

WHO *Health guidelines for vegetation fire events:* www.who.int/docstore/peh/Vegetation_fires/vegetation_fires.htm

Network of The Nature Conservancy (TNC). In September 2003, IUCN, WWF and TNC established a Global Fire Partnership which will emphasize addressing the underlying causes of wildland fire.

Since 2000 a number of bilateral and international cooperative agreements in sustainable wildland fire management have been initiated. There is a strong consensus at the international level to promote informal and formal cooperation programmes further. Numerous bilateral and multilateral projects have been supported by FAO (through its Technical Cooperation Programme), the International Tropical Timber Organization (ITTO), the United States (through agencies such as the United States Department of Agriculture Forest Service, the Bureau of Land Management, the United States Agency for International Development and the Office for Foreign Disaster Assistance), Canada, Australia, Germany (through the German Agency for Technical Cooperation [GTZ]) and other countries. The large number of bilateral agreements between countries sharing a common border or common disaster management system (e.g. ICS) indicates the willingness of nations to offer support and share resources.

CONCLUSIONS AND OUTLOOK

A number of United Nations agencies have recognized the significance of wildland fires in global change processes and have collaborated in harmonizing international efforts to reduce the negative consequences of wildfires, including those resulting from burning for land clearing. Solutions for sustainable fire management must address the complex range of factors that contribute to excessive burning and to the increasing vulnerability of vegetation systems to wildland fire and the increasing degradation of vegetation by fire. Demographics, poverty, social and political instability and the consequences of economic globalization are part of this development and are difficult to address by single or sectoral measures. ◆

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