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Forest Fires in the Baltic Region: National and International Issues

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1. Preface

In the second half of the 1990s the need has been recognized to create a forest fire forum in the Central-Northern European region in which the fire problems are entirely different from the Mediterranean part of Europe. The FAO/ECE Team of Specialists on Forest Fire is promoting a cooperative approach of the nations bordering the Baltic Basin to share fire management expertise and resources.

In September 1996 the UN-FAO/ECE/ILO Team of Specialists on Forest Fire proposed to call for a regional Baltic action plan concerning collaboration in forest fire protection and to convene a first regional conference. This proposal was submitted to the government of Poland. The government responded positively and hosted the First Baltic Conference on Forest Fires in Radom-Katowice in May 1998. The meeting was attended by scientists, managers and representatives from administrations of the host country (Poland), the Baltic States (Estonia, Latvia, Lithuania), the Nordic countries (Denmark, Finland, Norway, Sweden), Germany and Russia.

At the conference the establishment of pan-Baltic programs and exchange mechanisms encompassing fire research, fire management training, the use of prescribed fire (in forestry, nature conservation, and landscape management), and mutual fire emergency assistance were proposed.

Since the basic conditions for the creation of this regional initiative have not changed between 1998 and 2000, the conference participants and readers of this volume are kindly referred to the paper "The First Baltic Conference on Forest Fires (Poland 1998): Rationale and Results". It will be presented by the author on the second day of BALTEX FIRE 2000 and provides a retrospective of the First Baltic Conference on Forest Fires of 1988 and includes the updated report of the Team leader and the results of the 1988 conference.

At the opening of BALTEX FIRE 2000, the scope of work of the FAO/ECE Team of Specialists on Forest Fires is highlighted as well as the recent developments between June 1998 and June 2000 which are in line with the recommendations of the Poland conference. The continuation of the Baltic fire programme is recommended.

2. The Work of the UN-ECE/FAO/ILO Team of Specialists on Forest Fire in the Baltic Region

2.1 Introduction

One of the main activities of the Economic Commission for Europe (ECE) in the field of forest fires is (1) the periodic collection and publication of fire statistics of the member states, and (2) the work of the ECE/FAO/ILO Team of Specialists on Forest Fire.

The fire statistics are collected and evaluated by the UN-ECE Trade Division, Timber Section, Geneva. The statistics include all Western and Eastern European countries, countries of the former Soviet Union, the U.S.A. and Canada. The last data set covers the period 1995-97 (ECE/FAO 1998).

As a result of limited secretariat resources, countries members of the Joint ECE/FAO/ILO Committee on Forest Technology, Management and Training, have taken the challenge to undertake more work themselves, by entrusting to Teams of Specialists several of its activities, especially those where specific expertise is required. The Team of Specialists on Forest Fire was created in the 1980s and reorganized in 1993.

The team's main task is to provide a critical link in communication and cooperation between fire scientists, managers and policy makers. The main activities embrace (1) the production of International Forest Fire News (IFFN) in support of the Global Fire Monitoring Center (GFMC); (2) organization of seminars; and (3) promotion of synergistic collaboration between governments, non-government institutions, and individuals, especially science and technology transfer.

The scope of the work of the Fire Team includes the countries outside the ECE region because there is no similar institutional arrangement available in other FAO regions.

2.2 International Forest Fire News

International Forest Fire News (IFFN) is published bi-annually since 1988. It initiated a steadily increasing communication process in international fire matters. Since then IFFN provides an international information platform on which advances in fire research, technology and policy development are reported and disseminated. Currently the printed version of IFFN is subscribed by more than 1000 agencies, research laboratories and individuals all over the world. Starting with its 19th issue (August 1998) the IFFN are available on the homepage of the "Global Fire Monitoring

Center" (GFMC 2000a). The website includes all past issues since 1990 which are organized into 60 country folders and several other special files.

2.3 Seminars

The seminars conducted by the ECE/FAO/ILO Team of Specialists on Forest Fire between 1981 and 2000 focused on:

- * Fire Suppression Technologies (Poland 1981)
- * Fire Prevention (Spain 1986)
- * The Socio-Economic Environment of Fire (Greece 1991)
- * Forest, Fire, and Global Change (Russian Federation 1996)
- * The First Baltic Conference on Forest Fires (Poland 1998)
- * The Baltic Exercise on Fire Information and Resources Exchange - BALTEX FIRE 2000 (Finland 2000)
- * Forest Fire in the Eastern Mediterranean, Balkans and adjoining Regions of the Near East and Central Asia (2001 or 2002)

The bibliographic references of the conference results are available on the GFMC homepage (GFMC 2000b).

2.4 Team Members

The Fire Team was reorganized in May 1998. The list of team members is continuously updated on the website of the GFMC (GFMC 2000b).

2.5 The Baltic Fire Focus

The last Team meeting was held in May 1988 in conjunction with the First Baltic Conference on Forest Fires. The complete meeting report has been published in IFFN/GFMC (Goldammer 1998a). The following two items concerning the Baltic region were recommended by the Team:

Evaluation of the results of the First Baltic Conference on Forest Fires and its relevance to the Baltic 21 Action Programme on Forests

Besides the presentation of papers from the Baltic region, the conference focus was the contribution of forest fire management to the Baltic 21 Action Programme. The

conference participants agreed to develop a concerted regional Baltic Forest Fire Action Plan. This was reflected in the recommendations of the seminar.

A follow-up process to the conference was agreed, starting with a pan-Baltic forest fire exercise BALTEX FIRE 2000 (the Baltic Exercise in Forest Fire Information and Resources Exchange) to be held in Finland in 2000.

A controversial debate was held on the applicability of prescribed fire in vegetation management. The discussion revealed that there was no common and equal state of knowledge in some Baltic countries on fire ecology and the use of prescribed fire in forest and landscape management and in nature conservation. It was recommended that the team of specialists should organize a seminar on fire ecology and prescribed burning in the countries neighbouring the Baltic Sea.

It must be stated at this point, however, that one of the objectives of the First Baltic Conference on Forest Fires originally intended to elaborate on this topic. The absence of those speakers which had been invited to the conference to present papers on the history and use of fire left a gap which must be filled by a follow-up activity.

Future work contents of the Team: The Baltic Focus

Among the newly defined terms of reference of the Team the following was agreed:

As a consequence of the First Baltic Conference on Forest Fires it was agreed to establish a Baltic focus activity. The team members, which belong to the countries neighbouring the Baltic Sea, hereinafter referred to as Baltic States, will be members of a Baltic Task Force on Forest Fire. At present, the following countries are Task Force members: Estonia, Finland, Germany, Latvia, Poland, and Russia. It is still hoped that the remaining Baltic countries (Denmark, Lithuania, Norway and Sweden) will show interest in the work of the Task Force as further activities will develop. It was also agreed that the three following countries will have an observer status because their are either directly connected to the Baltic region or share common problems or developments in fire management: Belarus, The Netherlands, and the United Kingdom

Task Force leader for the next two years will be Mr. Harry Frelander (Finland) who will explore to host BALTEX FIRE 2000 in Finland. BALTEX FIRE 2000 will be the first pan-Baltic exercise in sharing transboundary information and resources in forest fire management.

3. Other Tasks accomplished after 1998

In accordance with the scope of work of the ECE/FAO/ILO Team of Specialists on Forest Fire listed in the report of its last meeting in Poland (Goldammer 1998a) a series of activities have been accomplished. These are summarized in Annex I.

4. Ongoing Tasks in the Baltic Regional and International Context

4.1 Establishment and Operations of the Global Fire Monitoring Center

Following the recommendations of the UN-ECE/FAO/ILO Seminar "Forest, Fire and Global Change" (Russia 1996) and the ITTO "Guidelines on Fire Management in Tropical Forests" and considering the events of 1997-98 in SE Asia and other parts of the world the team strongly underscored the need to establish a Global Fire Monitoring Facility (GFMF). The GFMF would process and publicly provide all information on fire and related to fire which would enable governments, international organizations and agreements, scientists and, through the media, the general public to understand fire and to respond appropriately. As a consequence of these recommendations the Government of Germany through the Ministry of Foreign Affairs, Office for the Co-ordination of Humanitarian Affairs, in June 1998 funded the establishment of the Global Fire Monitoring Center (GFMC) which could serve as precursor to GFMF (cf. INSARAG activity in para 4.3).

The GFMC is established at the Fire Ecology Research Group of the Max Planck Institute of Chemistry, Biogeochemistry Department, Germany, which also serves as a co-ordination unit of the Biomass Burning Experiment (BIBEX) of the International Geosphere-Biosphere Programme (IGBP), International Global Atmospheric Chemistry (IGAC) Project, the International Union of Forestry Research Organizations (IUFRO), the International Boreal Forest Research Association (IBFRA), and the UN-ECE/FAO/ILO Team of Specialists on Forest Fire. The GFMC is cosponsored by the

- * United Nations Educational and Scientific Organization (UNESCO)
- * World Bank, Disaster Management Facility (DMF)
- * World Conservation Union (IUCN).

With the transition of the IDNDR (1990-99) to the International Strategy for Disaster Reduction (ISDR) the GFMC supports its implementation and the work of the UN Inter-Agency Task Force for Disaster Reduction and its Early Warning Programme under the direct authority of the Undersecretary General for Humanitarian Affairs of the United Nations.

The GFMC fire documentation, information and monitoring system is accessible through the Internet (GFMC 2000a).

4.2 International Strategy on Disaster Reduction (ISDR)

From the beginning of the IDNDR and particularly at and after the World Conference on Natural Disaster Reduction (Yokohama, Japan, 23-27 May 1994) and the closing event of the IDNDR, the Geneva Forum (June 1999) the international community of fire scientists and managers formulated their programmatic visions to cope with disaster fires at national, regional and international scales. As stated above, these

shall be implemented in the IDNDR successor arrangement, the International Strategy on Disaster Reduction (ISDR) under the UN Interagency Task Force for Disaster Reduction.

During the transition of the IDNDR to the ISDR the Team leader has proposed the creation of the International (or Interagency) Task Force on Fire (ITFF). Under the possible Early Warning arrangement of the UN Interagency Task Force, the ITFF would establish an international forum for all UN agencies and programmes, and for international organisations, including NGOs. This proposal is currently investigated by the ISDR Secretariat.

4.3 International Search and Rescue Advisory Group (INSARAG) with a new Wildland Focus

Until recently the mandate of the International Search and Rescue Advisory Group (INSARAG) of the United Nations has been restricted to the "classical" SAR cases such as saving lives after earthquakes. However, experience has shown that secondary effects of natural and technogenic disasters require additional specialist advice in conjunction with SAR response and other humanitarian aid missions. The INSARAG family offers an appropriate structure.

At the regional INSARAG Europe-Africa meeting in December 1999 (Germany) a first proposal was elaborated to establish an INSARAG Fire Group consisting of three elements:

- * Wildland Fire
- * Hazardous Materials (Hazmat)
- * Industrial Fire

At a meeting at the UN Office for the Coordination of Humanitarian Affairs (UN-OCHA) in January 2000, it was agreed that the original mandate of INSARAG which in addition to search and rescue would also covers wider aspects of disaster/emergency response. This could include a variety of natural and human-made disasters, including wildland fires. INSARAG would assist in strengthening UN-OCHA's role by:

- * governmental experts advisory support in case of a major emergency
- * advisory experts to be provided out of the INSARAG family covering many fields of disaster relief

At the foundation meeting of INSARAG Fire it was recommended:

- * INSARAG-Fire is a global network of specialists in dealing with industrial fire, wildland fire and HAZMAT incidents affecting populations and the environment

- * INSARAG-Fire is organized in regional nodes
- * INSARAG-Fire has been initiated by a Starting Core Group of INSARAG Europe-Africa and will seek the establishment of Fire groups in the INSARAG Americas and Asia-Pacific regions.
- * Activation of involvement of existing international structures by calling on wildland fire expertise of international organizations and individuals already in place will be coordinated through the Global Fire Monitoring Center (GFMC) network
- * Encourage a continuous exchange of information through the Internet, initially utilizing the Global Fire Monitoring Center network

At the end of BALTEX FIRE 2000 the meeting of the FAO/ECE/ILO Fire Team further elaborate on the formation of the INSARAG Fire Group and particularly on the Subgroup Wildland Fire. The final format of INSARAG Wildland Fire will be submitted to the next INSARAG Europe Africa Regional Meeting (Tunisia, November 2000).

During its preparation phase the INSARAG Wildland Fire Subgroup already became operational in managing the large forest fire emergency in Ethiopia between February and April 2000. The coordination of a multinational fire fighting task force through the GFMC involved participation of Germany, South Africa, Canada, and the United States. The report is available at the GFMC website (GFMC 2000c).

4.4 FAO Forest Resources Assessment (FRA) 2000 Special Report on Forest Fires: A first Global Wildland Fire Survey

The UN-ECE/FAO/ILO Seminar "Forest, Fire and Global Change" (Russia, 1996) recommended to introduce an internationally standardized system of collecting and reporting statistical fire data. This recommendation was based on the fact that at present only few countries provide fire statistics which are useful for an international evaluation of the ecological, environmental and economic impacts of fire. Existing fire reporting systems such as the European Decentralized Database on Forest Fires which was created in accordance with the Resolution S3 of the Ministerial Conference at Strasbourg, or the ECE/FAO Forest Fire Statistics are of limited use for evaluating wildland fires at global scale. While the European Decentralized Database with its "common core" of parameters ("socle minimum") provides very specific information on the performance of fire services, this common core and most other data collection systems are not specifying the necessary details on forest and other vegetation types affected by fire, e.g. ecosystem response to fire, beneficial vs. destructive fire effects, economic losses, fuel types affected and fuel consumed.

The team recommended to introduce a data collection system which had been drafted for the Global Vegetation Fire Inventory (GFVI) some years ago. The required input parameters which still need to be agreed among the fire science, management and policy community, will raise the awareness of governments concerned about the

multitude of fire types involved in land-uses systems, fire-dependent or fire-tolerant vegetation, and in those forests and other vegetation types in which fire has destructive or destabilizing effects.

A first step towards improving the global fire data currently available at the GFMC website the FAO is now conducting a global forest fire survey in the frame of the Global Forest Resources Assessment (FRA 2000). A Special Report on Forest Fires will provide a global compilation of fire statistics and narratives by country. For the first time the FAO will request data on wildfires occurring on land which is not "forest" or "other wooded land" in accordance with the FAO standard definitions. The FRA-2000 Special Fire Report from includes "other land" which is defined as follows:

Land with less crown cover, tree height, or shrub cover as defined under "Other wooded land". Indicate under Comments section if recurring wildfires affect "Other land" by inhibiting regeneration to the "Forest" and "Other wooded land" categories.

With this category of vegetation fires the fire statistics will have an important additional value because in many regions recurrent (short-return interval) fires inhibit the recovery of forests after wildfires and maintain a grass-brush stage.

This global fire dataset will be compiled jointly by the GFMC and the FAO. The Fire Team and the GFMC consider this initiative as an extremely vital step towards a multiple-user oriented global vegetation fire inventory. At the stage of preparing this manuscript the procedural details of the FRA-2000 Special Fire Report have not yet been determined but will be presented at BALTEX FIRE 2000.

4.5 Intra-Regional Cooperation in Fire Management

Between the countries bordering the Baltic Region there are several border-crossing agreements concerning forest fires and currently one technical cooperation project underway.

Border-Crossing Agreements

Several agreements on mutual assistance in forest fire management along common national boundaries are active in the Baltic Region:

- * Finland - Russia (since 1994)
- * Creation of a special emergency unit "Finn-rescue-Forces (FRF) in Finland for the case of needs outside of Finland. Participating countries are: Estonia, Finland, Latvia, Russia, and Ukraine.
- * A fully automatic system has been developed to detect forest fires in the Baltic region using data from the meteorological NOAA satellites. The system has

been developed in Finland and tested in four experiments in Finland and its neighbouring countries Estonia, Latvia, Russian Karelia, Sweden and Norway.

- * Poland - Germany (since 1995). The Joint Committee for Programming and Monitoring of Transboundary Cooperation between Poland and Germany approved the Project "EUROLAS - Forest Fire Control". EUROLAS funding was granted by the CEC through the funding mechanisms of PHARE (Poland and Hungary Assistance to the Reconstruction of the Economy).
- * Nordic countries: Annual forest fire conferences of the government services involved in forest fire management.

TACIS Project ENVRUS-9701 "Improvement in Forest Fire Response System"

The framework for a forest protection project designed by the Federal Forest Service of Russia in the mid-1990s was submitted to the European Commission Directorate DG1a and approved as Technical Assistance to the Commonwealth of Independent States (TACIS) Project ENVRUS-9701. The project officially started in 1998 and has a lifetime of two years. The Federal Forest Service of Russia is the beneficiary, and its Central Base for Aerial Forest Fire Protection (Avialesookhrana) is the project partner.

The overall goal of the project is to support the establishment of management systems that will enable conservation aims to be achieved in the implementation of sustainable forest management objectives. Specifically, the project will aim to: (i) foster the development of sound and cost-effective fire and phyto-sanitary monitoring systems; (ii) improve information standards in support of monitoring and management objectives; (iii) support local management systems in making effective use of available information; and (iv) improve the response to forest fires, pests and diseases.

The project comprises, among other, the following activities:

- * Adaptation of existing satellite data acquisition and pre-processing software on the basis of sample data emulating the new receiving station
- * Tests of fire detection algorithms on the basis of existing NOAA data
- * Development and implementation of a federal and regional GIS, i.e. installation of GIS shell, development of baseline and operational data updating functions
- * Assessment of communication lines and internet access options to develop a forest fire information network (completed in the Moscow region, ongoing in the Irkutsk region)

The project is technically and scientifically supported by a European consortium of three consulting companies which have included a number of European scientists. The GFMC has a project backstopping function and publishes the TACIS Project Newsletter on the GFMC Website (GFMC 2000d).

4.6 International Development Programs

In the recent years an increase of bi- and multilateral technical development projects is noted in which expertise in fire science, management and fire policy development from the Baltic Region countries is transferred to developing countries. Some examples may underscore the importance and range of such projects:

- * German Agency for Technical Cooperation GTZ: Integrated (Forest) Fire Management Projects in Indonesia and Mongolia. Fire components in numerous bilateral forestry projects, e.g. Algeria, Argentina, and Sudan.
- * Namibia-Finland Forestry Programme conducted by FTP: Integrated Forest Fire Management Project (Caprivi). Numerous other fire management training programmes have been conducted worldwide.
- * The Natural Resources Institute in the United Kingdom: Installation of satellite fire detection and monitoring technologies in numerous developing countries
- * European Union: Forest Fire Prevention and Control Project in Indonesia.
- * Former Soviet Union: Technical fire management projects in Mongolia and Cuba.

It must be noted that this is not a complete list of technology transfer projects. An increase of technical cooperation projects is expected in future. It shows that problems related to management of wildfires and land-use fires in the developing countries have been identified.

Cooperation between the Baltic States to mutually assist in international cooperation projects is increasing. A good example is the cooperation between Finland and Germany in Namibia. The National Round Table on Fire with its long-term follow-up activities in the frame of the Namibia-Finland Forestry Programme has been supported by the GFMC.

The GFMC is currently assisted by the United Nations Development Programme (UNEP) to request funding from the Global Environment Facility (GEF) for a multinational network of Integrated Forest Fire Management Projects. Germany and Finland will play an important role in expanding these programs by ensuring technology transfer to countries in the developing world where no fire management capabilities exist.

Partnerships should be established between regions, such as the Baltic Region, the Mediterranean Region, ASEAN, the Southern African Development Community (SADC), or the Organization of American States (OAS).

5. Conclusions and Proposals

From the list of activities stated above and in Annex I to this report it can be concluded that a broad range of international fire management programmes is underway. These programmes have either direct or indirect influence on programmes of nations bordering the Baltic Sea.

BALTEX FIRE 2000 is the first regional fire management exercise in which fire managers, practitioners, administrators and scientists will exchange ideas and share knowledge and expertise. This exercise is unique and merits attention - not only by the BALTIC 21 Action Programme.

Forests are an important asset of the Baltic Region. In order to ensure the further development in active cooperation between the countries it is proposed to create a body in analogy to the FAO Committee on Mediterranean Forestry Questions *Silva Mediterranea – Silva Baltica*. The Network on Protection Against Forest Fires of a possible future FAO Committee on Mediterranean Forestry Questions *Silva Baltica* is already installed through the work of the FAO/ECE/ILO Team of Specialists on Forest Fire and this conference. Other co-players in sustainable forest management in the region are called to join.

ANNEX I

International Activities and Tasks outside the Baltic Region accomplished by the ECE/FAO/ILO Team of Specialists on Forest Fire between 1998 and 2000

1. Assistance concerning Fire and Transboundary Smoke-Haze Problems in the ASEAN Region

The Association of South East Asian Nations (ASEAN) forms a political and geographic entity, which similar to the ECE region and the Baltic Region, seeks cooperation in solving transboundary fire and fire-generated smoke pollution problems. ASEAN has appreciated inputs by ECE member countries to overcome the past and future environmental and humanitarian crises caused by indiscriminate burning of forests and other vegetation.

The Team contributed to the "Asia-Pacific Regional Workshop on Transboundary Pollution, Singapore, 27-28 May 1998" which was organized by the Germany-Singapore Environmental Technology Agency (GSETA). The ECE experience in transboundary air pollution was presented by various speakers. The team leader reported about common transboundary issues related to fire and haze in the ECE and the ASEAN region (Anonymous 1998).

As a consequence of the South East Asian fire and smoke-haze pollution episode of 1997-98 the World Meteorological Organization (WMO) also called for a Workshop on Regional Transboundary Smoke and Haze in South-East Asia which followed the GSETA meeting on 2-5 June 1998, Singapore. The workshop was one element of WMO's efforts to enhance the capacity and capability of National Hydrometeorological and Meteorological Services (NMHSs) in South-East Asia to monitor and model smoke and haze episodes and the long range transport of anthropogenic pollutants, and to improve the NMHS's abilities to advise, alert, and generally manage these pollution events. It involved a review and discussion of regional plans such as the WMO-PARTS (Program to Address ASEAN Regional Transboundary Smoke). Through the participation of the Team, the expertise gained from research and development in the fire sector in the SE Asian region was contributed (Goldammer 1999a).

At a later stage of the SE Asian fire crisis the Team reviewed fire management guidelines at the International Cross-Sectoral Forum on Forest Fire Management in South East Asia, Jakarta, Indonesia, 7-8 December 1998 (Goldammer 1999b).

In connection with the UNEP task "Coordination UN Response to Indonesian Fires" in which several Team members participated a contribution on global forest fire issues was prepared in fall 1998 for the UNEP magazine "Our Planet" (Goldammer 1998b).

Recognizing that smoke originating from land-use fires and wildfires is cause of acute and long-term respiratory health problems and requires the development of a comprehensive strategy based on broad international consensus, the Team in 1998 began to cooperate with the World Health Organization (WHO). After a scientific meeting on "WHO Health Guidelines for Vegetation Fire Events" (Peru, November 1998) the Team co-edited the guidelines document on behalf of UNEP, WHO, and WMO (Schwela et al. 1999, Goldammer 1999d, Goh et al. 1999).

2. International Decade for Natural Disaster Reduction (IDNDR) and International Strategy for Disaster Reduction (ISDR) and Related Activities

After the formation of the Working Group "Fire and Related Environmental Hazards" within the IDNDR Early Warning Programme in 1997, the Team participated in the IDNDR "Early Warning Conference 98" (EWC98) in Potsdam, Germany (September 1998). The team leader convened a session on Environmental and Technological hazards. Team members involved in the preparation of the report were the Team leader (convener) and two members from Canada and the U.S.A. The 1997 report of the IDNDR fire group was published at the occasion of the Potsdam conference (Goldammer 1997). The Team was also represented by the Team leader and the Team's Baltic Task Force leader (Finland) at the IDNDR Scientific and Technical Council (STC) meeting in Washington, August 1998.

At the closing event of the IDNDR, the Programme Forum convened in Geneva, 5-9 July 1999, the Team contributed jointly with the IUCN to the thematic session "Disaster Reduction and Preparedness through Protection of Natural Resources" with the contribution "Fire disasters, ecosystems and societies: Changing vulnerabilities" (Goldammer 1999e).

The ongoing and future role of the Team and the GFMC in the IDNDR successor arrangement, the International Strategy for Disaster Reduction (ISDR), are described in the main text of this paper.

The Team furthermore supported the establishment and is cooperating member of the ProVention Consortium on Natural and Technological Disasters at the World Bank, Disaster Management Facility (DMF) at the foundation meetings in Paris (June 1999) and Washington (February 2000).

The team through the GFMC is a cooperating institution and covers the wildland fire disaster component of the World Institute for Disaster Risk Management (DRM), a consortium of the Swiss Federal Institutes for Technology, Virginia Polytech, Swiss Reinsurance, and the World Bank.

3. Support of other UN Activities: Food and Agriculture Organization (FAO) and United Nations Educational and Scientific Organization (UNESCO)

Several members of the Fire Team (Finland, Germany, Spain, Turkey) contributed to the FAO Expert Meeting "Public Policies Affecting Forest Fire" (FAO, Rome, October 1998). The team leader contributed the forest fire analysis of the temperate-boreal part the ECE region (Goldammer 1999c). The expert meeting was followed by the FAO meeting of the ministers of forestry (March 1999). The recommendations of the FAO meeting were included in the "Rome Declaration on Forestry".

The Team leader and the GFMC have been entrusted by the FAO to update/revise the multilingual FAO Wildland Fire Management Terminology (FAO 1986).

The work of the United Nations Educational and Scientific Organization (UNESCO) was supported by participation at the UNESCO International Scientific Conference on Fires in the Mediterranean Forests (Goldammer 1999f). One of the two declarations released by the conference explicitly referred to the work of the Fire Team by stating (UNESCO 1999):

The Global Fire Monitoring Center (GFMC) was established in 1998 and is currently co-sponsored, among others, by UNESCO, the IDNDR and several international fire research programmes, and cooperates with UNECE/FAO and FAO Silva Mediterranea. The overall goal of the GFMC is to facilitate information exchange and decision support at an international level by providing near real-time fire monitoring, archive data and other relevant information. Mediterranean countries are urged to actively contribute to continuously improve the information and data flow to the GFMC in order to create a most complete fire information system, to share expertise and to contribute to common international action programmes in fire management and policy development.

The day-to-day liaison between the Fire Team and the Mediterranean fire issues is secured by the Team member of Spain who is also coordinator of the FAO Committee on Mediterranean Forestry Questions *Silva Mediterranea* Network on Protection Against Forest Fires (Vélez 1997).

4. Technologies for Remote Sensing of Fires

Advanced sensor technologies and operational systems of dedicated fire satellites are required to improve the spatio-temporal coverage and information content for research and disaster management purposes (Cahoon et al. 1999). A prototype improved high temperature event (HTE) sensor, the Bi-spectral IR Detection (BIRD) small satellite mission is currently developed by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt - DLR) in co-operation with the GFMC. The development of the Innovative Infrared Sensor System FOCUS, to be flown as an early external payload of the International Space Station (ISS) is another joint DLR-GFMC project (Oertel et al. 1999). Scientific backstopping of both projects is supported by two

members of the Fire Team and other scientists from the Baltic region, including Finland.

The Team activities are also linked to the work of the Committee of Earth Observation Satellites (CEOS) in implementation of the International Global Observing Strategy (IGOS) and provides inputs into the Disaster Management Support Group (DMSG) and the Global Observation of the Forest Cover (GOFC) Fire Group (Goldammer 2000).

5. Fire Science Programmes

A broad range of fire science programmes is underway within the Baltic Region or by participation of countries of the region. Recent and currently ongoing projects have been described in the FAO Regional Report on Temperate-Boreal Asia (Goldammer 1999c). Thus, the readers are kindly referred to that overview which contains the following information:

International fire research programmes

International Geosphere-Biosphere Programme (IGBP): Fire Research Campaign Asia-North (FIRESCAN); IGBP Northern Eurasia Study; International Boreal Forest Research Association (IBFRA) Fire Working Group; International Union of Forestry Research Organizations (IUFRO) Forest Fire Group (8.05).

National fire research programmes

- Finland:** Monitoring and suppression of forest fires; use of aircraft and retardants; fire danger rating; satellite remote sensing
- Germany:** Fire ecology, fire management and fire policy development; interdisciplinary fire research in support of biogeochemistry, atmospheric chemistry and climate studies; development of spaceborne sensing systems for detection, monitoring and characterization of fire and fire effects
- Poland:** Fire hazard assessment, fire detection and monitoring by satellite; fire weather forecasts; fire extinguishants; ecological and environmental impacts of forest fires
- Russia:** Fire ecology, biogeochemistry (carbon cycling), fire history, fire and fuel mapping, prescribed burning, use of remote sensing in fire management and fire impact assessment; mechanical equipment for fighting forest fires on the ground; spaceborne detection of fires and particularly the development of airborne fire suppression technologies, including additives (retardants); effects of fire on radioactively contaminated terrain
- Sweden:** Fire history research; historic role of fire at the landscape level

Intra-regional cooperation in fire research has been realized in several cases, particularly in an international fire experiment in 1993 in the frame of the Fire Research Campaign Asia-North (FIRESCAN Science Team 1996).

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