



**International Conference
Climate Change and Forest Fires in the Mediterranean Basin:
Management and Risk Reduction**

Nir Etzion, Mount Carmel, 24-26 January 2012

**Statement by the Ministry of Environmental Protection, Israel
30 January 2012.**

The Ministry of Environmental Protection, in cooperation with the Keren Kayemeth LelIsrael-Jewish National Fund (KKL) within a framework of the EU ERA-NET CIRCLE 2 for promoting research and cooperation on climate change adaptation held an international conference on Climate Change & Forest Fires in the Nir Etzion Hotel on Mount Carmel near Haifa. The conference took place between 24 and 26 January 2012.

The objectives of the conference were to share scientific knowledge, policy tools and practical experience for effective management for the prevention of forest fires and for ecological rehabilitation following fires under conditions of climate change.

Approximately 150 people participated in the conference including government ministries, local government, the Fire and Rescue Services, the Nature and Parks Authority, KKL-JNF, researchers from academia, the private sector and NGOs.

This international conference also hosted lecturers and guests from Jordan, Kosovo, Greece, Italy, Portugal, Spain, Canada and the USA. Among our guests from abroad were Prof. Johann Georg Goldammer, director of the Global Fire Monitoring Center (GFMC) / UN University); Prof. José Moreno from the University of Castilla de la Mancha, and Prof. Jon E. Keeley, US Geological Survey and adjunct professor of the University of California, Los Angeles, with other distinguished guests.

The first day involved sharing scientific knowledge and focused on the relation between climate change and forest fires; forest fire management; post fire ecological assessment & rehabilitation; and knowledge gaps and research needs.

Climate change affects temperature increases and heat waves which have an increasing impact on wildfires. The fire, its size and its intensity are correlated to weather conditions in the months and days prior to the fire's ignition. The increasing risks and the 2010 Mt. Carmel Forest wildfire disaster were the main incentives to organize this conference. Interesting findings that came up during the lectures presented in the first day were:

- In Europe, it was found that the massive emigration from rural areas to cities have left agricultural areas susceptible to forest growth and takeover, increasing the fire risk in many areas. The EU representative claimed that the number of fires and the burned area did not increase with time. However, the damages are more severe due to the proximity of forests to human settlements.
- In California, the growth in population increases the man made fires and the proximity of the fires to settlements increases damages.
- In Israel the vast majority of fires are human-made.
- Military activity is a major cause of fires around the world, and in Israel it was shown that they are amongst the costliest to extinguish. The leading method to control and prevent fires is to reduce the amount of forest vegetation materials. One suggestion is to bring back herds of goats to forest areas. Natural rehabilitation of the forest, as opposed to planting trees, was raised as an issue to be further examined.
- The Carmel fire started after 8 months of no rain and under extreme dry conditions. One of the main causes for the fire abating was a quick change in wind direction from east to west together with a rapid increase in humidity from 10 to 90%.

- There are a number of monitoring and fire tracking systems in Europe whose high costs demand collaboration between many countries. Israel was invited to participate in a number of such programs.

The second day of the conference concentrated on the transition between science and policy and from policy to application and management. The Carmel rehabilitation status after the fire, decreasing rehabilitation costs, and forest management plans for reducing fire risks were among the main topics that were discussed.

- The Ministry of Environmental Protection presented the main results obtained by the committee that was selected by the Minister of Environmental Protection. The main results were:
 - Natural system rehabilitation based on natural processes
 - Reducing the dense pine forest component of the Carmel landscape
 - Desired landscape - a variety of patches: open areas, groves, woods and mixed patches
 - Establishment of buffer zones between landscape units and around settlements
 - Landscaping development for the communities in areas that are prone to fire
 - Preserving the local pine tree population that is natural to the Carmel, which is genetically distinct
- The importance of goat herding in the buffer zones and in the forest for maintaining the clearings was presented.
- The heads of the two regional municipalities, Dalyat el Carmel and Usafia said they consider the forest an important resource. They added they would like to work with KKL and the NPA and that they would like for discussions and decisions regarding the Carmel forest management to be made together with the local population.
- Ecosystem services coming from nature but needing to serve people were emphasized. Thus in every system the human factor should be considered by using social science tools and need to consider cultural preferences which other ecologic and economic tools cannot assess.
- The role of the local population should also be understood including the benefits of the forests as green lungs, pollution filters, improvers of local climate and noise reducers and a general and wide education program should be established among the local population.
- The day ended with a session about technological tools, remote sensing, aerial photography and special analyses to assess fire risks and projections. Another interesting tool presented was a Canadian thermal camera which helps fire fighters track the fire front, hot spots and roots fires.

On the third day participants took a field tour to the Carmel Forest to assess the rehabilitation efforts, soil erosion and management successes and difficulties in the Carmel area. The tour concluded with an open discussion where the foreign visitors commented on the rehabilitation efforts, emphasizing the importance of a long-term strategic plan for forest management and mapping risky areas in the forest including soil erosion and areas required fuel brakes.

Minutes of the Conference

Climate Change and Forest Fires in the Mediterranean Basin: Management and Risk Reduction 24-26 January 2012, Nir Etzion, Israel

By the Global Fire Monitoring Center (GFMC)

Sharing of Scientific Knowledge

In the Opening Session and Kenotes Sinaia Netanyahu, Chief Scientist, Israeli Ministry of Environmental Protection, welcomed the participants and notably the foreign guests. Netanyahu elaborated on the goals of the policy of the government of Israel to reduce greenhouse gas emissions under an Inter-Ministerial Committee founded in 2009, and a national action plan, with a commitment of \$US 620 million for greenhouse gas reduction investments. Following the wildfire, which affected the Mount Carmel Biosphere Reserve in 2010, initiative was taken to investigate the causes and consequences of wildfires, and the action to be taken.

Yael Shaltiel, Director General of the Jewish National Fund (JNF), reflected about increasing fire threats globally. The wildfire on Mount Carmel in December 2010 burned 250 homes, required the evacuation of three communities with 20,000 people. 44 people were killed during the fire. Yael Shaltiel stressed that the conference will provide a platform for exchange of experience of scientists and practitioners.

Orna Matzner, Israeli Ministry of Environmental Protection, introduced the first speaker, Tiago Capela Lourenço, **CIRCLE2 ERA-NET** Project Coordinator, University of Lisbon, Portugal. In his presentation "Climate Impact Research & Response Coordination for a Larger Europe" he introduced the objectives, structure, context and activities of CIRCLE2 ERA-NET, a network of 34 institutions from 23 countries committed to fund climate change and adaptation research. Forest fires were defined in 2011 as one of the priority areas. Israel took the lead in implementing the initiative. This meeting is aimed at exchanging views and experiences in new decision making methods on climate change adaptation and fire management and risk reduction in the Mediterranean Basin, and particularly addressing research needs, policies and networking in the region.

GFMC was kindly asked to look at **Wildland fires in the Eastern Mediterranean & Near East from the perspective of the International Strategy for Disaster Reduction**. GFMC Director Johann Georg Goldammer, who is serving also as Coordinator of the Global Wildland Fire Network of the United Nations International Strategy for Disaster Reduction (UNISDR) and the UNECE/FAO Team of Specialists on Forest Fire, reviewed the socio-economic conditions and public policies in the Eastern Mediterranean and Near East Region. Land-use change is the most prevailing and common determinant of fire use and wildfire occurrence and impacts. Rural exodus caused by urbanization of the young generation in many countries has resulted in the depletion of the rural work force and their role in land cultivation and fire protection. Rapidly growing fallow in many countries contributes to an increase of wildfire hazard. Climate extremes, possibly already a precursor of regional climate change, are another common determinant of increasing wildfire risk. The problem of fires burning in terrain contaminated by unexploded ordnance (UXO) and landmines stemming from previous conflicts, and wildfires started intentionally or as collateral damages during armed conflicts, or as consequences of political tensions, constitute additional threats to human security in the region.

Insights in the **Relationship of climate and fires in California** were given by Jon E. Keeley, U.S. Geological Survey, and University of California, Los Angeles. He first referred to an investigation in the Western US revealing that fires seasons are becoming prolonged. Databases of the U.S. Forest Service 1970-2009 (focusing on forests) and CalFire 1960-2009 (including also other lands, lower elevations areas, where more humans are living) were evaluated as well as meteorological records (increase of rainfall and temperatures), decrease of regular fire use and allowing natural fires to burn, resulting in increased wildfire threats. Population increase in Northern California brought increasing fire activity, and less fires in the lesser populated South. Large fires are occurring more frequently, possibly a consequence of increasing dead fine fuel availability.

In the following session **Climate Change and Forest Fires** José M. Moreno (University of Castilla-La Mancha, Toledo, Spain) elaborated on the **Likely impact of climate change on vegetation and fire regimes in the Mediterranean Basin** and concluded that climate change will expand the fire season and increase seasonal severity in the Mediterranean region, while Ricardo Trigo (University of Lisbon Campo Grande, Portugal) looked at the **Role of climate extremes (heat waves) driving large wildfires in southern Europe & Meteorological fire risk in the Mediterranean**. The contributions of meteorologists and fire scientists from Israel followed by analyzing the **Weather conditions during the Mount Carmel 2010 Forest Fire and other fires in Israel** (Dan Malkinson and Haim Kutiel, Haifa University, Israel).

In the sessions **Forest Fire Management** Noam Levin (The Hebrew University of Jerusalem, Israel) looked at **Wildfire regime in Israel in the 2000s: A national analysis using satellite images** and concluded that most fires had been burning in herbaceous vegetation, not in forests. The theme of **Post-fire restoration in the perspective of climate change** was highlighted by Ramon Vallejo (CEAM, Spain) who looked at approaches to assess post-fire restoration needs. The next speaker Shay Levy (Haifa University, Israel) analyzed **Forest Fire Management in Israel: Ecological and Economical Aspects** using a unified database that includes all existing data in the authorities that are involved in firefighting and fire-prevention. The data were collected from 12 firefighting unions, JNF-KKL (Forestry Department), and from airborne firefighting operations. The evaluation revealed, among other, that wildfires management policy and planning should be based on a holistic approach

considering plant biomass as potential fuel, plant flammability, topography, weather conditions, consequent fire intensity and fire spread.

With the presentation on **Livestock grazing in managed pine forests: Fire hazard reduction vs. forest regeneration and diversity** by Yagil Osem (Agricultural Research Organization, Israel) the benefits and the adverse effects of grazing were analyzed. His survey showed that there are three general trends in the country:

- Total exploitation of grazing area in the North and the South, and a lack of grazing in central Israel
- Permanent cattle grazing in the north and prevailing seasonal sheep grazing in the south
- A good control of seasonal grazing vs. limited control on permanent grazing lands

Target-oriented management should support maintenance of fuel break zones (fuel reduction) and recreation zones (infrastructure, human activities), and contribute to multifunctional landscape management with regards to biodiversity conservation, natural regeneration, landscape aesthetics, and human activities. In future “grazing services” may take over the role – “prescribed grazing” as formulated by GFMC.

The theme of soil erosion was addressed by the papers **Soil erosion assessment and mitigation following wildfires in Portugal: The state-of-affairs of the EROSFIRE decision-support tool for post-fire land management and impact assessment of future scenarios** (by Jan Jacob Keizer, Centre for Environmental and marine Studies (CESAM), University of Aveiro, Portugal), **Fire effects on soil properties and erosion dynamics: New perspectives** (by Lea Wittenberg, Haifa University, Israel), **Using synthetic polymers to prevent soil erosion after fire in Mediterranean forests** (by Meni Ben-Hur, Institute of Soils, Water and Environmental Sciences, Volcani Center, Israel).

Presentations on post-fire ecosystem development included **Resilience and natural post-fire regeneration of Mediterranean trees – implications for post-fire management** (Gidi Ne’eman, University of Haifa-Oranim, Israel) who recommended among other to shape future forests according to local needs, conserve landscape patchiness, and the use of fuelbreaks. Grazing, logging and pruning, as well as the use of prescribed fire as management tools.

The paper **The effect of fire on the fauna of the Mediterranean basin: An overview and synthesis** by Ido Izhaki (University of Haifa, Israel) was based on a review of the literature (50 papers) of the last 15 years with the aim to summarize the major knowledge of the short- and long-term effects of wildfires on vertebrates in shrub lands and forests in the Mediterranean basin, from the population to the community levels, and to identify practical aspects for conservation and management, based on the information reviewed. He concluded that the impact of climate change will govern future development.

In the session **Knowledge Gaps, Research and Networks** The Joint Research Centre of the European Commission, Institute for Environment and Sustainability, provided the EU perspective on forest fires in Europe where every year on average 65,000 fires are affecting 500,000 ha vegetated lands (thereof 85% in PT, ES, FR, IT and GR). He elaborated on the role of the EU in international collaboration by highlighting the contribution of European Commission Directorate Generals (DGs) in the field of forest fires, European Forest Fire Information System (EFFIS), the role of the Monitoring and Information Centre (MIC). The next presentation on the **Israeli perspective in light of the 2010 Mount Carmel Fire** (by Avi Perevolotsky, Agricultural Research Organization, Israel) looked at the knowledge gaps, e.g. by asking if these are real or artificial; assumed that there is a tendency to “re-invent the wheel” and not to rely on information from other countries.

Regional perspectives: The role of formal and informal networks was the title of the presentation of Johann G. Goldammer (Global Fire Monitoring Center [GFMC], Max Planck Society for the Advancement of Science and United Nations University [UNU], Germany). He stressed that globally the need has been recognized by nations and international organizations to share knowledge, human and technical resources in fire management. Transboundary cooperation in fire management aims at taking advantage of and sharing the specific technical and scientific expertise developed in the various countries and regions globally, including concepts and methodologies of best practices and capacity building in fire management. In addition, international assistance is often needed in wildfire emergency situations during which a country may run out of resources and require international assistance. Informal networking within the UNISDR Regional Southeast Europe / Caucasus Wildland

Fire Network (a regional network of the Global Wildland Fire Network) is receiving increasing support. Partners in cooperation in fire management in the region are financed by the Environment and Security Initiative (ENVSEC), a partnership of six international organizations – the Organization for Security and Co-operation in Europe (OSCE), Regional Environment Centre for Central and Eastern Europe (REC), United Nations Development Programme (UNDP), United Nations Economic Commission for Europe (UNECE), United Nations Environment Programme (UNEP), and the North Atlantic Treaty Organization (NATO). Recent experience in multinational response to fire emergencies in Israel and Russia in 2010 have revealed the lack of agreed international standards for ground and aerial firefighting missions. The beginning for a new standard will be addressed by the “International Fire Aviation Working Group” (IFAWG), which is operating under the auspices of the UNISDR Wildland Fire Advisory Group. The participation of Israel in the work of the GFMC was offered.

On the second day in the session **From Science to Policy and from Policy to Practice** David Brand (Chief Forester, Head of the Forest Department, KKL-JNF, Israel) welcomed the participants on behalf of Yael Shaltieli, Director General, KKL-JNF, Israel. Contributions in this session addressed the publicly and scientifically debated **Rehabilitation of Mount Carmel after the fire in December 2010** (Yeshayahu Bar-Or, Ministry of Environmental Protection, Israel). The discussion after his presentation among other addressed the problem of wildfires caused by the military. In this discussion GFMC repeated what was said in the introductory speech that this is a problem similar to other countries, and that the military should actively participate with increased awareness but also specialized units that may serve also outside military areas / exercises.

The **Wildland fire urban interface in Israel, a methodological approach to prevention and reduction of the social and economic impact** was presented by F. Rodríguez y Silva (University of Cordoba, Spain) followed by the presentation of Hugh D. Safford (USDA Forest Service, California, USA) on **Making fuels management compatible with restoration objectives: case studies from the US Mediterranean-climate zone** who concluded with regards to the applications to Mt. Carmel that maquis and *Pinus halepensis* are adapted to Fire Regime IV of California and most oaks can tolerate frequent fire; and that Wildland fuel breaks can serve to “compartmentalize” fires, but only under moderate conditions and when they can be accessed safely; and fuel break networks can be integrated into trail and park systems, but will need constant maintenance.

In the session **Forest Fire Management** David Brand (Chief Forester, Head of the Forest Department, KKL-JNF, Israel) presented his views on **Prevention management of forest fires in Israel** in which he introduced the history of JNF-KKL, and the history of forest cover of Israel, fire hazard and risk reduction. He detailed about the role of fuel breaks around residential communities, their maintenance, the roles of grazing services, and the role of fuel breaks inside forests. Investments of two million dollars for fuel break establishment are planned. He called explicitly for testing the application of prescribed burning in maintaining fuel breaks. The presentation **Forests fires prevention programs in natural reserves and forests in the region of the Mediterranean** by Yehoshua Shkedy (Nature & Parks Authority, Israel) showed that Israel Nature & Parks Authority is closely working hand in hand with JNF-KKL and the Ministry of Agriculture. One of the problems in Israel is that the Maquis is closing up and that open habitats for species that need these open-land conditions are disappearing, along with an increasing wildfire hazard. „We have too many trees. When trees are closing up, we are losing species / habitats” he said and “grazing is essential”.

Shmuel Fridman (Ministry of Agriculture, Israel) in his paper **Grazing as a tool for fire prevention** looked back to the history of the Authority of Grazing, which was established in 1977 by Ministry of Agriculture, Israel Lands Administration and the Jewish National Fund. Professional grazing requires the mapping of grazing zones and vegetation formations, and matching the pastures to different types of animals. The paper **Governmental involvement and regulation in determining forest management policy** by Hagai Snir (Ministry of Agriculture & Rural Development, Israel) looked first back to history, notably the British Forest Ordinance of 1926-1960 which focused, among other, on supporting the growth of woodland and forest, protecting trees, tree nursery establishment, dune stabilization. The Governmental policy 1948-1960 supported forest reserves declaration, conducted massive afforestation, mainly by the JNF, and enforced the ordinance. The convent between the state and the JNF resulted in the closure of the governmental forest department, and JNF became responsible for managing state forests and forest reserves. In 2001 a new era began after the Supreme Court brought the state back into the game, and the Minister of Agriculture returns to be the Forest Commissioner. The Vision is to complete an updated forest law together with JNF and the Ministry of Environmental Protection.

In the **discussion with local authorities from M. Carmel Druze villages** a representative of local authorities stressed that authorities would not recognize and understand the people living in the forest and that they should not consider people as a threat to the Mt Carmel Park. He asked how can a Biosphere Reserve be established without a community? After the 2010 fire he said he had hoped that KKL would “come to us and we would build a common authority”. He asked “Does fire know borders? No. We need to think regional”, and “I want my village to participate. We want tourism, we want life quality. It is possible to work with us We need a green culture. We need partnerships and need to look for formulas. Let us look what the biosphere will tell us to do.

The second speaker agreed. “The JNF and others still see us as enemy. Before establishment of the Park we had 10 Druze settlements, only two are left.” According to the State Ombudsman there should be an escape route. This could become a buffer zone, allow the residents of the villages to evacuate or to receive help. 1 km road, paved, needed, but there was lot of resistance. We need this for security, and we want to cooperate and need your help. It will become the most beautiful biosphere reserve of the world. Through education and dissemination, an authority should be created, and inevitable fires will become less severe.

The representative of the Nature & Parks Authority replied that indeed the authorities are talking among each other and not to the Druze communities. However, your communities are also not talking among you. You have the possibility to address government.

A representative of the community elaborated on the concept of a Biosphere Reserve. It is about preservation of nature and local people. Section 5 of the Biosphere Document refers to the role of education. “I want to give my son environmental education. I do not have the tools, but you have them.”

In the session **Community Engagement in Forest Fire Management** Uriel Safriel (Hebrew University, Jerusalem, Israel) asked **The Biosphere Reserve – A paradigm shift in nature conservation?** The reserves need legal protection & community participation. It is better to go for bottom-up decisions with community participation, instead of top down like it happens in many nature reserves. Besides the esthetic and ethic value conservation paradigm and the paradigm “human survival, value of nature” the MAB Action Plan 2008 is looking after ecosystem services. Missing incentives include community involvement. **Research for people, but without people: What is missing in research on forest ecosystem services?** was the theme of the paper presented by Daniel Orenstein (Center for Urban and Regional Studies, Faculty of Architecture and Town Planning, Technion Haifa, Israel) in which he asked why expert policy recommendations for fire adaptation were not adopted and why there is a continuing conflict between preservation goals and development. He considers the Millennium Ecosystem Assessment as human-centered. He suggested that the inclusion of social ES assessment in the Carmel Forest might strengthen post-fire policy making and fill gaps in knowledge regarding how stakeholders perceive the forest and its management. **FireSmart: Forest and land Management options to prevent unwanted forest fires** were presented by Ana Sebastián López (GMV Aerospace & Defense, Spain) recommended better targeted and optimized awareness raising. **Protecting each other: The Forest and the Community** by Salman Aburukun (Nature & Parks Authority, Israel) said “What we need is for communities to become reacquainted with forests on a new and different level. We should get to know the forest with all of our senses and understanding the variety of services we enjoy thanks to it. This should be done by inculcating two principles: Trees and forests have a right to live, just like we do, and for the forest to protect us, we have to protect the forest. This is our moral obligation.”

In the following general **Discussion** themes included benefits of the Biosphere Reserve for Druze and other communities, questions whether fenced goats without shepherds will work under the threats of jackals and stealing. How much money needed for fuelbreaks?

In the session **Technologies and Innovative Approaches in Forest Fire Management** Kostas D. Kalabokidis and Palaiologos Palaiologou (University of the Aegean, Greece) reported about the advancements of **Forest Fire Modeling aided by Web GIS in a Changing Climate**, followed by the paper **Assessing fire risk: post-fire analysis of pre-fire mapping – A recent case study from Mount Carmel** by Yohay Carmel (University of Haifa, Israel), **Evaluating drought stress changes in planted forests by means of remote sensing** by Michael Dorman (Ben-Gurion University of the Negev, Israel) who observed increased mortality of *Pinus halepensis* in the planted forests during the last decade. Stephen Achal (Itres Research Limited, Canada) provided insight in his work on **Very**

Large-Scale, High Spatial Resolution Airborne Thermal Mapping of Wildfires in Northern Canada using the TABI-1800 using the Thermal Airborne Broadband Imager, a new type of high performance airborne thermal imager delivering large-scale and traceable apparent radiant temperature maps.

On 26 January 2012 a field excursion to Mt Carmel allowed conference participants to get a close insight in the ecological conditions of the Biosphere Reserve, the history of wildfires pre-2010 and during the 2010 fire. At the end of the excursion a closing discussion focused on the problems of erosion, salvage logging, wood removal, the future of forests, landscapes and on fuel break. Foreign participants of the conference and excursion were challenged to provide a one-page statement on the utility and concepts of fuel breaks.

Reflections about the Conference

Climate Change and Forest Fires in the Mediterranean Basin: Management and Risk Reduction

24-26 January 2012, Nir Etzion, Israel

by Global Fire Monitoring Center (GFMC)

1. Pre-conference I

Cooperation of GFMC with Israel started in 1989 with invited participation of Israeli fire scientists at the Third International Symposium on Fire Ecology, hosted by the Fire Ecology Research Group (since 1998: GFMC) at Freiburg University, Germany.¹ In the 1990s GFMC cooperated with Israeli scientists and KKL forest management staff in publishing scientific and technical forest fire reports in International Forest Fire News (IFFN) (edited by GFMC).² In 1995 GFMC cooperated with KKL and scientists in Israel with emphasis on an assessment of the fire ecology and wildfire threat of Mt. Carmel, one year before its designation of Biosphere Reserve.

During the Mt. Carmel wildfire in December 2010 GFMC monitored the situation and provided advice to countries offering firefighting support to Israel.³ After the 2010 fire emergency GFMC monitored national Israeli and international reactions, reports and analyses of the fire, as well as follow discussions and discourses, notably the debate on reforestation / rehabilitation and improvement of Israel's ground and aerial firefighting capacities. The GFMC logbook is available on request. GFMC through UNECE (Geneva) was in contact with the Embassy of Israel to the UN Geneva and offered its availability to conduct a post-fire assessment mission with UNEP and provide advisory support by GFMC staff, the expertise of members of the Global Wildland Fire Network (GWFN)⁴ and the International Fire Aviation Working Group (IFAWG).⁵ These offers, although officially conveyed to the government of Israel, remained unanswered.

2. Pre-conference II

The Conference was convened as a contribution of Israel to the CIRCLE-2 ERA-NET (Climate Impact Research & Response Coordination for a Larger Europe) programme in which Israel is participating. At the Bologna meeting in 2011 (CIRCLE2 Design Workshop, 22 July 2011) it was decided to

¹ Contribution of Dres. Zev Naveh, Pua Kutiel, Haim Kutiel and Jacob Garty were published in the book volume / proceedings of the symposium: Goldammer, J.G., and M.J. Jenkins (eds.) 1990. Fire in ecosystem dynamics. Mediterranean and northern perspectives. SPB Academic Publishing, The Hague, 199 p.

² IFFN website: <http://www.fire.uni-freiburg.de/iffn/iffn.htm>, country folder with articles published by Israeli fire specialists: <http://www.fire.uni-freiburg.de/iffn/country/country.htm#ISRAEL>

³ The daily monitoring reports of GFMC are available at GFMC archive (country folder Israel): <http://www.fire.uni-freiburg.de/current/archive/archive.htm#ISRAEL>. Access of encoded web pages by User ID: fire; Password: 1

⁴ <http://www.fire.uni-freiburg.de/GlobalNetworks/globalNet.html>

⁵ <http://www.ifawg.org/>

organize a conference preliminarily entitled “Forest Fires in the Mediterranean basin and Climate Change – tools for risk reduction and management”, to be hosted by Israel in January 2012. In September 2011 the Federal Environment Office of Austria, Environmental Impact Assessment and Climate Change Division, CIRCLE-2 ERA-NET member, contacted the Global Fire Monitoring Center (GFMC) and suggested a cooperation with the Ministry of Environmental Protection of Israel to prepare the conference.

This suggestion was positively responded by the Global Fire Monitoring Center (GFMC)⁶ as it was in line with the interest and engagement of GFMC in forest fire and climate change issues in the Eastern Mediterranean region and in Israel since the 1990s.

3. The Conference: Objectives and contributions

The carefully prepared agenda of the conference with a balanced thematic selection of national and international contributions, organized in sessions

- Sharing of Scientific Knowledge
- Climate Change and Forest Fires
- Forest Fire Management
- Knowledge Gaps, Research and Networks
- From Science to Policy and from Policy to Practice
- Forest Fire Management Panel Discussion
- Community Engagement in Forest Fire Management
- Technologies and Innovative Approaches in Forest Fire Management

provided a logic walk through the world of wildland fire – from the fundamentals of fire science to policy and practice. Presentations by national and international experts addressed issues that are indeed of general relevance to the situation in the Mediterranean.

However, last not least most presentations addressed the situation in Israel. Thus, was the conference theme either misleading, or did the event not address the conference theme?

Clearly, the overall scope of the CIRCLE-2 ERA-NET programme is to coordinate European transnational research funding on climate change impacts, vulnerability and adaptation, and to facilitate the transfer of research outcomes that European and national decision makers need to design effective yet economically efficient adaptation initiatives and strategies. Thus the network is pan-European. The theme agreed upon at the CIRCLE-2 Design Workshop in Bologna, July 2011, aimed at addressing “forest fires” at pan-Mediterranean level.⁷

During the last two decades scores of scientific and technical conferences have addressed the theme of wildland fires (including forest fires) in the Euro-Mediterranean region. The Eastern Mediterranean region, however, had been neglected largely, especially from the point of view of the ecological, socio-economic and political conditions determining wildland fires in the Near East / Middle East. The only regional conference so far was the “Conference on Forest Fire Management and International Cooperation in Fire Emergencies in the Eastern Mediterranean, Balkans and adjoining Regions of the Near East and Central Asia”, an activity of the UNECE/FAO Team of Specialists on Forest Fire convened in Antalya, Turkey (2004). The conference, which was not attended by Israel, provided a forum for the exchange of information of forest services and fire services of the region and resulted in the release of the “Antalya Declaration on Cooperation in Wildland Fire Management in the Balkans, Eastern Mediterranean, Near East and Central Asia”.^{8 9}

⁶ <http://www.fire.uni-freiburg.de/>

⁷ In average 60% of the area affected by wildfires in the Euro-Mediterranean region are non-forest ecosystems. The Nir Etzion conference contributions and discussion confirmed the need to look at forest and non-forest ecosystems and to both the positive role and the negative effects of fire.

⁸ http://www.fire.uni-freiburg.de/iffn/iffn_31/05-IFFN-31-Antalya-Conference-2.pdf

⁹ In the follow up and the spirit of the Antalya declaration bilateral assistance in fire emergencies was provided by several participating nations, notably by Turkey (firefighting assistance provided to Syria and Georgia).

Israel took advantage of the opportunity of hosting a CIRCLE-2 ERA-NET climate change / fire conference to direct national and international attention to the proper fire problems of Israel.

4. Impressions

From the international perspective it is suggested to review if the contributions and discussion had provided new insights or “added value” for the international and national Israeli community (by themes of sessions):

- **Sharing of Scientific Knowledge:** The contributions and discussion with national and international wildland fire scientists provided a unique opportunity for exchange. While this kind of conferences had been held in almost all European countries before, the benefit was certainly highest for Israeli participants.
- **Climate Change and Forest Fires:** Main drivers of fire and change of fire regimes all over the UNECE region, the Near and Middle East, and Israel in particular, are socio-economic changes, land-use change (notably rural exodus and abandonment of traditional land cultivation methods) affecting landscape flammability and vulnerability; and in some cases socio-political and ideological conflicts that are bearing wildfire ignition potential. Compared to other regions in the world the assumed impacts of climate change on fire regimes may be less important than the above-mentioned consequences of changes of society.
- **Forest Fire Management:** A key issue was the discussion of prescribed grazing for fuel reduction and maintenance of openness of landscape elements and fuel breaks. This discussion was important and mutually beneficial for international and national Israeli attendees. Presentations and discussion concerning post-fire erosion did not bring new insights. Exchange of experience in the use of prescribed fire was not covered adequately.
- **Knowledge Gaps, Research and Networks:** This session was rather beneficial for Israeli attendees, probably also for international participants who were not all involved in international, regional or thematic scientific or fire management networks. Although Israeli fire specialists had been in occasional contact with the “outside” world, mainly in the scientific arena, the session was quite informative and resulted in many questions & discussions on networking arrangements, especially in the corridors and during the excursion.
- **From Science to Policy and from Policy to Practice:** This relatively short session could not provide sufficient space considering the significance of the need to develop comprehensive fire management policy at national level and to bring this to practice. However, the discussion of the rehabilitation of Mt. Carmel, which over the last year had been monitored from outside Israel, and the decision to have a 1-year “moratorium”, is reflecting the desire to develop a policy that would address the complexity of ecosystem management pre- and post-fire in a Biosphere Reserve and elsewhere. The wildland-urban interface discussion will become more important for Israel as overall landscape flammability will increase as a consequence of land-use abandonment and takeover of forest vegetation.
- **Forest Fire Management Panel Discussion:** An important element of the presentations and discussions was the maintenance of open land ecosystems which in some places are endangered by the invasion of forest. This theme was scratched at the surface only, but certainly could not be covered in detail by a short conference. However, inspirations were generated.
- **Community Engagement in Forest Fire Management:** The discussion with local authorities and the presentations revealed a lack of experience in involving community participation in fire management (Community-based Fire Management) in Israel. International participation in providing examples on the role of civil society and communities in fire management was inadequate.
- **Technologies and Innovative Approaches in Forest Fire Management:** This session could also scratch the surface only, but certainly provided insight in some projects and advances of technology. Added value, however, was limited.
- **Field Excursion to Mt. Carmel:** The field trip provided an excellent opportunity for national and international attendees to exchange views. Very beneficial for all.

5. Media coverage

Besides the report by the Ministry of Environment of 30 January 2012¹⁰ the only media coverage known to GFMC is the report "Climate Change and Forest Fires Conference" published in Jerusalem Post on 1 February 2012.¹¹ There was no opportunity to publicly express international views of the Mt. Carmel fire by an institution like GFMC.

6. Expert impressions

From the international perspective the conference was not designed to address the pan-Mediterranean fire issues affected by climate change.

From the point of view of Israel, however, the conference was overdue and needed.

As it happens often, disasters unveil gaps and deficits in policy and state institutional capacity, but also public awareness and attention. The Mt. Carmel fire of December 2010 brought a dormant problem to the surface and to public and political discussions and challenged the country to respond.

The fire has been perceived as an unprecedented disaster. And indeed the tragic accident, the death of 43 cadets and a police officer, resulted from a decision by local police and happened in a situation in which local police officers globally, who were not capacitated at all in the basics of wildland fire behaviour and fire safety, would have done a similar decision (or "mistake"). This loss of lives was a tragic accident. This accident is not a key issue of discussing future policy and action.

For the Mt. Carmel Biosphere Reserve the fire was neither a disaster nor unforeseeable. Only the time and the reason (cause) of the inevitable fire could not be predetermined.

The post-fire development of fire-affected ecosystems must be monitored carefully, e.g. will introduced / systematically afforested pyrophytic species such as Aleppo Pine become so dominant that the wild growth of forest will become dominant over the native maquis?

Most important will be how the authorities concerned with / responsible for fire management, land-use planning and land management, including forestry and authorities concerned with fire suppression, will collectively respond to the general "fire situation" in the country, i.e. to respond to

- changing fire regimes likely to be associated with increasing wildfire risks and threats – consequences of rural exodus, decreasing intensity of land cultivation and increasing wildfire hazard; and
- changing vulnerability of predominantly urbanized society and ecosystems to fire.

Compared to neighboring Near East / Middle East countries Israel is facing a rather unique future, the consequence of massive afforestation which besides the desired effect of "greening the country" is bringing fire to the desert.

This challenging and demanding situation will require to take advantage of the expertise of the international wildland fire community which has been dealing with the problems encountered in Israel but not necessarily in one single country. No country in size of Israel can afford to provide scientific and institutional capacity to address all the fire problems that are accumulating these days.

7. Recommendations

Thus, from the point of view of GFMC the following major themes need to be addressed

- Networking: Israel to urgently seek cooperation with dedicated regional and global networks of specialists, institutions and countries cooperating in fire science and management. Post

¹⁰ http://www.mfa.gov.il/MFA/Innovativelsrael/International_conference_Climate_Change_Forest_Fires_31-Jan-2012.htm

¹¹ URL expired

conference (29 January 2012) GFMC has sent a letter to the Ministry of Environmental Protection, JNF / KKL and the Ministry of Agriculture and Rural Development providing suggestions;

- Israel needs a coordinated national structure in the form of a permanent body at inter-agency level with participation of civil society, tentatively called "National Wildland Fire Management Board". In this board agencies, academia and civil society would jointly work on solutions of the complex problems and have a coordinated voice in the national and international community, allowing to build national capacity based on a sustainable memory;
- Development of a National Fire Management Policy, which would address the underlying causes of environmental and society changes affecting wildland fire, and action to be taken to implement the policy;¹²
- Assessment of the role and need for sustainable management of cultural landscapes opposite reforestation / afforestation or traditional conservation approaches (conserving by prohibiting any ecosystem treatment / manipulation);
- As the country is transiting from desert country to flammable: Investigate the use of prescribed grazing and prescribed fire as integrated management tool¹³;
- Give emphasis on Community-based Fire Management approaches to address wildland fire management at the level of those who are primarily affected by wildfires.

The offer to Israel to become involved in major thematic and geographic networks addressing wildland fire, including the Global Wildland Fire Network or the International Fire Aviation Working Group (IFAWG), is repeated.

I suggest strongly convening a National Round Table on Fire Management, if the *Lindenstrauss Report* would render this proposal superfluous.

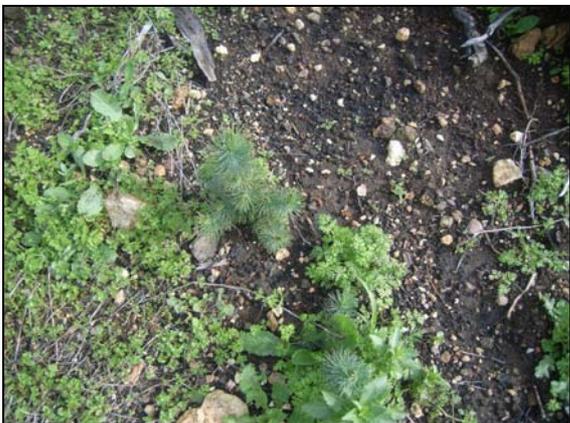
Some Visual Impressions of the Conference



The Conference Group

¹² The report of the State Comptroller Lindenstrauss *The Carmel Fire December 2010 – Omissions, Failures and Conclusions*, submitted to government on 9 February 2012, is not yet available to GFMC.

¹³ See the recent developments in temperate-boreal Eurasia concerning the use of prescribed fire via the *Eurasian Fire in Nature Conservation Network*: <http://www.fire.uni-freiburg.de/programmes/natcon/natcon.htm>



Field visit of the burned area, fire history trees, post-fire seed sources and seedlings of rather aggressive post-fire pine colonization, and post-fire erosion.