Sustainable Forest Management and Influences on Water Resources

– Coordinating Policies on Forests and Water

Workshop on Forests and Water
12-14 May 2009 in Antalya, Turkey

Background document
1. Introduction

This background paper is prepared for the workshop on forests and water; *Sustainable Forest Management and Influences on Water Resources – Coordinating Policies on Forests and Water*, to be held on 12-14 May 2009 in Antalya, Turkey. The document is based on the material prepared for and discussions at the session on forests and water on 23 October 2008, during the European Forest Week in Rome, as well as a survey on forests and water in the UNECE region conducted February-April 2009.

The aim of this paper is to stimulate a well informed discussion by providing the participants with background information and a summary of presentations for the workshop as well as some core questions which will be raised during the workshop. The paper presents the interrelation of forests and water, linkages between the forest and water sectors, and some state of the art in the European and Central Asian countries related to work on forests and water issues.

Participants at the workshop are invited to share their views on forests and water and take part in an in-depth discussion on the issue.

Forests and water are closely related. Yet, both issues have been discussed separately for a long time. In recent years we have however witnessed meetings bringing together experts from different fields with different backgrounds specializing in forestry, water management, landscape or nature conservation, where the relationship between forests and water is being discussed. There is increasingly need for the different sectors to communicate and cooperate in order to facilitate coordination and coherence of plans and instruments, especially in the light of climate change. There is significant potential for common activities, from which, both forest and water sectors could benefit.

Scope and objectives

Based on the MCPFE Warsaw Resolution 2: Forests and Water, and work under the UNECE Water Convention on ecosystem services, this workshop on Forests and Water will examine the complex interrelations and mutual influences of forests and water, how countries approach these topics, and how this is and could be reflected in forest and water policies in the pan-European and UNECE region and neighbouring states.

The objectives of the workshop are:

- exchange of experiences on forest and water management tools and policies that contribute to realize water related forest ecosystem services
- explore cross-sectoral work and how the coordination of forest and water policies could be conducted:
  - at national level
  - at regional level
- explore payment for ecosystem services schemes (PES) and other measures that broaden and diversify the financial basis for sustainable forest management and help maintaining the protective functions of forests
2. The interactions of Forests and Water

The availability and quality of clean water in many regions of the world is increasingly threatened by overuse, misuse and pollution. In this context, the relationship between forests and water is a critical issue that must be accorded high priority.

A key challenge faced by land, forest and water managers is to maximize this wide range of multi-sectoral forest benefits without detriment to water resources and ecosystem function. To address this challenge, there is an urgent need for better understanding of the interface between forests/trees and water, for awareness raising and capacity building in forest hydrology, and for embedding this knowledge and research findings in policies. There is also need to develop institutional mechanisms to enhance synergies in dealing with forests and water issues and to implement and enforce action programmes at the national and regional levels. *(FAO Forestry Paper 155, Forests and water, 2008)*

It is in maintaining high water quality that forests make their most significant contribution for the supply of water. Through the stabilisation of soils, forests minimize erosion and hence reduce the impairment of water quality due to sedimentation. Furthermore, by trapping sediments and pollutants from other up-slope land uses and activities, forests can protect water bodies and watercourses.

Other benefits of forests are multiple: By intercepting precipitation, evaporating moisture from vegetative surfaces, transpiring soil moisture, capturing fog water and maintaining soil infiltration, forests influence the amount of water available. By maintaining or improving soil infiltration and soil water-storage capacity, they influence the timing of water delivery.

In the future, climate change and the increased frequency of extreme weather events will have a considerable impact on hydrology and water resources possibly resulting in catastrophes such as landslides, floods and droughts that may themselves be influenced by forest cover. Research has shown that proper maintenance as well as the restoration of damaged and degraded forest ecosystems can play a protective role and cushion the effects of climate change.

Despite the wide range of services provided by forests, their role in the regulation of water flows and safe water supply, is often overlooked and not taken into account when developing policies or water management plans. Even though forests constitute “natural infrastructure” for water supply and protection against hazards, other technical infrastructure measures (e.g. dams, reservoirs or filtration plants) are often preferred. An integrated approach and mutual awareness and recognition among the
water and forest authorities is missing in many countries as well as internationally. This lack of cooperation and coordination often results in problems when working on specific water and forest related issues (e.g. floods). In order to address this issue in a more coherent way, there is a need for cooperation between the forest and water sectors.

An additional problem is that despite significant advances in scientific understanding of forest and water interactions, the role of forests in relation to the sustainable management of water resources remains a contentious issue. The concrete impacts of forests on water resources are influenced by numerous factors including climate, topography, soil, forest type (age and species of trees), watershed area under forest as well as forest management practices. This indicates the difficulties in transferring research findings to different countries, regions or even watershed scales and shows that for any concrete intervention a site-specific examination regarding the interaction of forests and water resources is necessary. Furthermore, there is a gap between research and policy. This gap persists partly because of the difficulties to formulate general principles about forests and water interactions and partly because of a failure to communicate results of hydrological and forestry research as well as findings about the interaction of the two effectively to policy makers.

3. **How are forest and water issues dealt with at the regional level?**

The interrelations between forests and water have been in focus at different levels in the pan-European and UNECE region. On the management and policy level, both the Ministerial Conference on the Protection of Forests in Europe (MCPFE) and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) have taken significant steps forward.

**MCPFE**

The 5th MCPFE was held on 5–7 November 2007 in Warsaw, Poland. The Conference theme: “Forests for Quality of Life” highlighted the contemporary challenges and decisions to assure that Europe’s forests continue to be managed sustainably and provide benefits to the best of their potential.

In Warsaw Resolution 2: Forests and Water, the ministers responsible for forests in Europe recognise the importance of forests and forest management to water resources. The ministers committed to maintain and enhance the protective functions of forests for water and soil, as well as for mitigating local water-related natural disasters through sustainable forest management, and public and private partnerships. They also stressed the importance of developing, improving and coordinating policies for forest and water resources management (e.g. through national forest programmes and Integrated Water Resources Management plans), especially in the context of climate change. They addressed also the need to facilitate financial measures to maintain the protective functions of forests.

The Warsaw Resolution is an indication that forests and water is one of the most important forest policy issues in Europe at present.
**UNECE Water Convention**

The UNECE Water Convention is intended to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and groundwaters.

Under the Convention, work has been done on the issue of ecosystem services. Two seminars on Role of ecosystems (13–14 December 2004) and Environmental services and financing (10–11 October 2005) respectively have been conducted by the UNECE countries. In addition, the *Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management* was adopted by the Parties to the Water Convention at their fourth meeting (20–22 November 2006). The Recommendations are the product of much work and were developed through a remarkable participatory cross-sectoral process. MCPFE was represented in the drafting group for the recommendations.

**Legal and policy frameworks (in the pan-European and UNECE region)**

The most important legal and policy frameworks, as well as important regional documents and activities regarding or influencing policies on the interrelation of forests and water are stated in Table 3.1:

Table 3.1, Commitments and work of relevance to the interrelations between forests and water

<table>
<thead>
<tr>
<th>Commitments and work conducted</th>
<th>Relevance</th>
<th>In the frame of</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCPFE Resolution V1: Strengthen Synergies</td>
<td>Cross-sectoral</td>
<td>MCPFE</td>
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<tr>
<td><strong>Seminar on the role of ecosystems as water suppliers</strong> (2004, <a href="http://www.unece.org/env/water/meetings/ecosystem/seminar.htm">http://www.unece.org/env/water/meetings/ecosystem/seminar.htm</a>)</td>
<td>Forests as an important contributor to the ecosystem services for water.</td>
<td>UNECE Water Convention</td>
</tr>
<tr>
<td><strong>Seminar on environmental services and financing for the protection and sustainable use of water-related ecosystems</strong> (2005, <a href="http://www.unece.org/env/water/meetings/payment_ecosystems/seminar.htm">http://www.unece.org/env/water/meetings/payment_ecosystems/seminar.htm</a>)</td>
<td>Forests as an important contributor to the environmental services for water.</td>
<td>UNECE Water Convention</td>
</tr>
</tbody>
</table>
- Sustainable management of forests in relation to water  
- Coordinating policies on forests and water  
- Forests, water and climate change  
- Economic valuation of water-related forest services. | MCPFE |
| **Guidelines for Afforestation and Reforestation** (adopted at the MCPFE Expert Level Meeting, November 2008: [http://www.mcpfe.org/node/156](http://www.mcpfe.org/node/156)) | Recommendations for afforestation and reforestation programmes with regard to impacts on water resources, specifically addressed in paragraphs 5, 11, 12, 25, 26 and 31. | MCPFE |
Through 2008, we have additionally seen several conferences and international meetings concerning forests and water issues in the pan-European and UNECE region:

- 26th Session of the European Forestry Commission Working Party on the Management of Mountain Watersheds on “Forests, water and climate change in high altitude and high latitude watersheds”, 19-22 August 2008 in Oulu, Finland
- III International conference “Forest and Water”, 14-17 September 2008 in Mragowo, Poland
- International Conference on Water and Forests: a convenient truth?, 30-31 October 2008 in Barcelona, Spain
- Plenary session “Forests and Water” during the European Forest Week, as well as national events promoting the issue during the same week, 20-24 October 2008

4. National survey results, main findings, April 2009

To gain a clear picture of the experiences made and obstacles faced in the pan-European and UNECE region, and how best to accommodate further needs in the area of forests and water, a survey was distributed to all focal points of the MCPFE and the UNECE Water Convention in February 2009.

The survey had the primary objective to support the organisers in preparing the upcoming workshop on Forests and Water. Some of the results are however also presented below and in Annex 1 to the background paper.

In total, 37 respondents in 29 countries had answered the questionnaire (April 2009). The findings of the survey are not to be regarded as full national reports, but they give a picture of the state of the art in the countries from the point of view of the respondents.

Policy and management instruments
The respondents of the survey were asked if policy and management instruments addressing the interrelation between forests and water were developed in their countries. The response shows that most of the countries have developed such instruments, but only a few have separate documents or specific guidelines dealing with the interactions of forests and water. (Annex 1, Table 4.1 gives an overview of the reported situation in the 28 countries.)

Coordination of instruments
Both forest and water sectors have developed overall regional instruments to be implemented at national or water basin levels. Three such instruments are national forest programmes (as developed by the forest sector), Integrated Water Resources Management Plans (as approved by the Johannesburg World Summit on Sustainable Development) and the Water Framework Directive/River Basin Management Plans (as developed within the EU)
The survey reveals that there is good coordination of these instruments between forest and water sectors in 6 of the countries, whereas 17 countries say that their coordination is either poor or lacking.

The survey aimed at identifying the obstacles in the countries for coordination between forest and water sectors. A few countries did not answer this question. One of the country respondents says specifically that there are no obstacles for cooperation and that there are already common working groups between the two sectors for the development of rural areas and for the management of natural hazards. Among the other respondents several obstacles are identified. The obstacles can be divided into five groups (Institutional, financial, laws and regulations, knowledge related and other) (please see Annex 1, Table 4.2 for the full list of obstacles identified):

- **Institutional obstacles**
  - High number of stakeholders dealing with forest and water management
  - Differences in responsibilities of the two sectors and different ministries
  - Contradictory interests
  - No reference to the important water-protection function of the forests in policy documents and no joint management plans
  - National forest programmes often considered as being sectoral and not governmental responsibility for implementation

- **Financial obstacles**
  - Lack of financial resources
  - Non-existence of motivation tools for forest owners to perform the proactive measures for water sources

- **Laws and regulations**
  - Inadequate laws and institutional interests

- **Knowledge**
  - Scientific debates and contradiction on the positive and negative aspects of forest on water. Need for precise knowledge.
  - Potential goal conflicts and to some extent a lack in knowledge
  - Outdated views on old-style forestry as a source of diffuse pollution and water problems

- **Other obstacles**
  - Often coordination starts after damage has occurred
  - Lack of clear political commitments
The survey also asked the respondents for measures on how to overcome these obstacles. Below you will find some of the stated solutions, divided into the same groups (please see Annex 1, Table 4.2 for the full list):

- **Institutional measures**
  - Creation of interdepartmental advisory groups, establishment of inter-entities and intersectoral bodies
  - Joint work in assessing the role of forests for water quality and quantity and the prevention functions. Establishment of national joint working group between experts in these two sectors.
  - Participatory approach in forest and water management planning
  - To use NFP (national forest programmes) as a real integrated programme for coordination of forest and water policies

- **Financial measures**
  - Integrated water and forest management plans including budgets
  - Compensations and motivation schemes to forest owners (e.g. tax reliefs, PES, direct payments)

- **Laws and regulations**
  - Perfection of laws and regulations

- **Knowledge**
  - Demonstrative local projects to increase political awareness
  - Better awareness and evaluation not only of environmental but also of socio-economic impacts
  - Increasing knowledge about inter-relationship between causes and effects among forest owners and operators - information and dialogue to build consensus and a shared understanding

**Economic valuation of water-related forest services**

Finally, the survey also asked for examples and experiences on payments for ecosystem services (PES) and other measures that aim to broaden and diversify the financial basis for sustainable forest management and to maintain the protective functions of forests for water in the countries of this region.

10 countries state that the PES related to forests and water interactions are addressed in national policies/strategies in their country. However, the financial measures stated are above all public subsidies for protection of forests. No examples of private payment schemes were addressed. (Please see Annex 1, table 4.3 for the full list of answers to the financial questions.)
5. Questions to be addressed at the workshop

For the full overview over the program for the workshop in Antalya, we refer to the second announcement and the program, which will be distributed. We will however draw your attention on some main questions which will be addressed during the two days meeting.

The first day of the meeting will be devoted to national presentations and plenary discussions. At the second day, group discussions will be facilitated.

The main goal of this workshop on Sustainable forest management and influences on water resources – Coordinating policies on forests and water is to contribute to the development of stronger linkages between the two sectors. In order to achieve this goal, and based on the questions and discussions at the session on forests and water at the European Forest Week in Rome, the discussion of the following issues could stimulate further efforts:

(a) Where do participants see concrete benefits of collaboration between the forest and the water sector? Do national strategies make the link between forest and water risk management to deal with water quality, floods, droughts, soil erosion, land slides in the context of climate change, predication of drier summers and water shortages?

(b) Where do the representatives of each sector see obstacles that hinder collaboration? How could they be overcome?

(c) How could collaboration between the two sectors be fostered? Within their particular area of work, where do the participants see concrete areas for collaboration at national and regional levels? How can the implementation of the MCPFE Warsaw Resolution 2: Forests and Water be promoted?

(d) Are there national examples of cooperation between the forest and the water sectors? Are there concrete examples of the use of payments for ecosystem services (PES) schemes in the region, which benefit the forest, or the water sector, or both? Are PES addressed in your national policies and strategies on forests and water?

6. Summaries of presentations

Below you will find summaries of presentations to be held at the workshop in Antalya.

Any summaries which are not to be found in this document, will be posted at the MCPFE web page (www.mcpe.org/forests_and_water) and at the web page for the workshop (www.ogm.gov.tr/Forestsandwater) as soon as they are ready.
Forests and water: process understanding and international momentum

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The interactions between forests and water and the benefits of forests for water supply are multiple: By intercepting precipitation, evaporating moisture from vegetative surfaces, transpiring soil moisture, capturing fog water and maintaining soil infiltration, forests influence the amount of water available. By maintaining or improving soil infiltration and soil water-storage capacity, they influence the timing of water delivery. It is however in maintaining high water quality that forests make their most significant contribution. Through the stabilisation of soils, forests minimize erosion and hence reduce the impairment of water quality due to sedimentation. Furthermore, by trapping sediments and pollutants from other up-slope land uses and activities, forests can protect water bodies and watercourses. Finally, forests make a key contribution in the mitigation of water-related hazards such as floods (at the small scale), landslides and droughts. In view of climate change and the likely increase in the frequency of extreme weather events, this mitigation function of forests will get additional importance.

The relationship between forests and water is getting increasing international attention and momentum. An important milestone was the “International Expert Meeting on Forests and Water” held in 2002 in Shiga, Japan, in the context of the 3rd World Water Forum. The adoption of the MCPFE Warsaw Resolution 2 in November 2007 was a further milestone and triggered a series of important events in 2008 such as the Third International Conference on Forests and Water (Mragowo, Poland), the plenary session on forests and water during the European Forest Week (Rome, Italy) and the conference on “Water and Forests: a Convenient Truth?” (Barcelona, Spain). This series of events resulted in a number of key issues and challenges and evidenced the need to:

• improve the process understanding of the forest and water interactions and of their differentiation according to agro-ecological zones
• bridge the communication gap between research and policy
• enhance the collaboration between the forest and water sectors
• develop policy frameworks which embed both forest and water concerns
• generalize case studies / local experiences into policy advice
• develop institutional mechanisms which cross administrative boundaries
• pay particular attention to payment for ecosystem services
• enhance information exchange and communication
• develop integrated response strategies of the forest and water sector to global drivers of change

The MCPFE Workshop in Antalya will be another important opportunity to bring the forests and water agenda a step further.

Short biography
Thomas Hofer is a Geographer from Berne, Switzerland. After extended research work on watershed management and mountain development in the Himalayan region (India, Nepal, Pakistan Bangladesh and China) he joined the Food and Agriculture Organization of the United Nations (FAO) in 1998. Thomas Hofer is in charge of FAO’s regular programme on forest hydrology, watershed management and sustainable mountain development. He is responsible for many field projects, for conceptual activities and for FAO’s support to international processes.
Forests and Water at the Regional Level; 
Main Findings from the Survey on Forests and Water

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The interrelations between forests and water have been in focus at different levels in the pan-European and UNECE region. On the management and policy level, both the Ministerial Conference on the Protection of Forests in Europe (MCPFE) and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) have taken significant steps forward.

The importance of forests and forest management to water resources was stated by the ministers responsible for forests in Europe through Warsaw Resolution 2: Forests and Water. The resolution was endorsed at the 5th MCPFE, held on 5–7 November 2007 in Warsaw, Poland.

To compile experiences made and obstacles faced in the pan-European and UNECE region, a survey was distributed to all focal points of the MCPFE and the UNECE Water Convention in February 2009. A short summary of the results of the survey is presented in chapter 4 of the background document for the workshop on Forests and Water in Antalya, Turkey (pages 7-9).

Short biography
Kjersti Bakkebø Fjellstad is a policy adviser at the MCPFE Liaison Unit, which is now situated in Oslo, Norway. Among her main responsibilities of work is the follow-up of Warsaw Resolution 2: Forests and Water from the 5th MCPFE.
Country Report on Forest and Water Resources Management

Republic of Turkey
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Forest and Water Resources of Turkey
Turkey is a mountainous country with regional climatic differences. Turkey is located on a land characterized with rough topography and variable ecologic, economic, and social conditions. This situation caused the formation of a heterogeneous forest cover throughout the country, existence of diverse ecosystems, and therefore need for different forest management strategies. The total area is 779,452 km² of which 6500 km² occupied by inland waters.

The last figures show that there is 21,188,747 hectares of forest in Turkey. Forests are generally located on mountainous areas and they are generally semi-natural with high biodiversity value.

Forest management planning system is a very prestigious discipline in Turkish forestry. All forests have to be managed in accordance with management plans. Since the first management plan in 1917, the planning system has evolved in terms of techniques used. After a long period of forest management plans practices which are wood production oriented, GDF has declared to initiate functional planning.

The predominant species in Turkey are Pinus brutia, Pinus nigra, Pinus silvestris, Abies spp. (A. ciliicica, A. nordmannia, A. equi-trojani are unique), Picea orientalis, Cedrus libani, Juniperus spp., Pinus, pinea, Cupressus sempervirens, Pinus halepensis, Fagus orientalis, Quercus spp., Alnus spp., Castanea sativa, Carpinus betulus.

The forests in Turkey are also home to most of 120 mammals, 454 birds and 93 reptiles found in the Country.

The presentation also includes the population growth, urbanization and migration, deforestation and ecosystem degradation due to human settlements and its consequences on water quality and quantity, erosion, and desertification in Turkey. Forestry for Establishing Sustainable Water Resources Management Policies, the principles of watershed management in Turkey, climate change and the threat on the implementation of a sustainable management policy, the integration principle and coordination necessity between forest and water resources management are also touched on the presentation.

A brief biography of Mr. Mustafa Yurdaer:
He was born in 1963 in İstanbul. He received his education from the University of Istanbul – Faculty of Forestry. He has been working for the General Directorate of Forestry – Turkey since 1994. He has taken part in many projects since 1994. His major topics have been forest inventory and forest planning. Since 2003, he has been the head of the forest administration and planning department which is responsible for managing Turkey’s forests. He is married with two children.
Austria is a mountainous country in the centre of the Alps. Nearly two thirds of its whole area is belonging to mountainous regions according to the definitions of the Alpine Convention.

More than the half of this area is covered by forests: these are about 40,000 qkm
Common sense: Forest Use for cutting wood

In detail 4 functions of forests: utilization, welfare, recreation and protection

Protection function is most important in the mountainous regions.

Forest spatial planning has the task to determine the priority of the protection function

More than 30% of forests in this region fulfil the function of protection against natural hazard relating to the disastrous forces of water as like as avalanches, floods, bed load transport, mud streams.

About 15% of the Austrian forests are restricted in their use due to the function of water protection as like spring areas, karst regions, floodplain and riparian forests and ground water protection areas.

To fulfil these functions in the best manner, there are running several programs for redeveloping the wood cover in the steep and naked slopes in the valleys of the Alps.

Annually an amount of 15 Mio € is spend for different measure programs as like

- Reforestation of former grassland in the alpine regions
- Rejuvenation of existing forests by removing the oldest trees
- Construction of roads for logging the trees
- Technical measures to improve the start up conditions for the young trees

Nearly the half of the money is spend in the federal region of Tyrol due to its mountainous conditions. Next countries are Salzburg, Carintia and Styria.

The work is particularly done by the Forest technical Service, a subordinate agency of the Federal Ministry of agriculture, forestry and water management with its 28 offices on district level and 7 agencies on regional level

Within several programmes initiated by the Spatial Planning direction of EC, planning methods and determining of land use due to the natural conditions becomes improved in cooperation especially with the new member countries in the neighbourhood.
Forest and Water in the Czech Republic

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Abstract

Presentation briefly summarises current forest and water management policies and legislative tools and country situation referring forest ecosystem services after the 5th MCPFE in Warsaw 2007. The second phase of the National Forest Programme is mentioned in this connection as well.

Of course, also the importance and complex interactions between forests and water of the Czech Republic are underlined particularly in relation to floods and torrents and mountain watersheds and an example of forest/water relation in the air-polluted region is presented, too.

The situation of funding in forestry is not very gratifying and it concerns also PES including important water services offered to the whole society. There is put forward an idea of improvement of described situation in closing, which concerns the integration of non-wood benefits and forest services into the economic structure of forestry, as its economic component of its production part.

Short biography

Mr. Jaroslav Kubišta is the branch director of the Forest Management Institute (FMI) in Czech Republic.

The Forest Management Institute, in Czech “ÚHÚL”, is a government organization established by the Ministry of Agriculture of the Czech Republic. The main subjects of activity are the Forest inventory in the Czech Republic (FI), an independent survey of forest lands and their development, Compilation and administration of Regional Plans of Forest Development (RPFD) and Information and Data Centre (IDC) for forest and game management sector of the Czech Republic.

Within Sweden, there is a great potential for forestry to affect the status of water. Forests cover 55% of the land area and as the stream density is high in the landscape - forests border many thousands of kilometres of streams, rivers and lakes.

The interest in water environments in the forest landscape is in general high among forest stakeholders. Also the knowledge about effects of forestry actions on fresh water fauna is rather high, but the knowledge on effects on water chemistry has to improve. No one wants to harm water quality on purpose. One main task for the Swedish Forest Agency is to give advice to forest owners on best practice forest management, and since the implementation of the EG Water Framework Directive (2000/60/EG), water environments have got much more attention than before.

In the Forestry Act there is a paragraph regulating considerations to biological and cultural values. It contains a few statements about consideration to water environments, but it may not be enough to ensure that the quality of water environments is protected according to the EG Water Framework Directive. Therefore, at the request of the Swedish government, the Forest Agency is reviewing the formulations in the Act. That commission is to be reported to the government in March 2010.

Another way to integrate forests and water in Swedish environmental politics has been through a suggested new interim target in the national environmental quality objective “Sustainable forests”. New interim targets may be set by the Swedish Parliament during 2010.
Forests and forest management practices can have a major impact on the freshwater environment. Good forest management can help counter diffuse water pollution, enhance aquatic and riparian habitats, conserve water resources and reduce downstream flooding. In contrast, poor planning and management can exacerbate water shortages, contribute to local flooding, and lead to increased acidification, eutrophication and siltation. These can damage wildlife and fisheries, and increase costs of treatment for drinking water.

The principal guidance on protecting freshwaters within UK forests is the Forestry Commission’s Forests & Water Guidelines. They were first published in 1988 to advise forest owners and managers how forests influence the freshwater ecosystem and how operations should be carried out to protect and enhance the water environment. The Guidelines apply equally to state and private forestry sectors and it is a condition of approval for forestry grants, felling licences and forest plans that all operations meet the required standards.

The Guidelines are now in their fourth edition and a further review is underway to ensure they continue to reflect the most recent legislation, policy, practice and research, as well as deal with new challenges such as the impact of climate change, expansion of energy forests and drive to extract more woody residues for wood fuel. A sub-set of the measures on good practice have been translated into legislation in Scotland as General Binding Rules. The success of the Guidelines in addressing the potential threats posed by forestry to water is shifting attention to how woodland creation can be used to improve the ecological status of water bodies and help meet the objectives of the EC Water Framework Directive (WFD).

Devolved country forestry strategies in the UK recognise the benefits of forests for water and support targeted woodland planting to help control diffuse pollution from more intensive agricultural and urban activities, as well as alleviate downstream flooding in towns and cities. ‘Opportunity mapping’ has been used to direct woodland planting towards preferred sites for protecting sediment sources and intercepting sediment pathways, and to reduce rapid runoff and attenuate flood flows. However, securing these opportunities will require closer integration and co-ordination of forest and water policy and plans to enable better decisions to be made and available incentives and regulatory controls used more effectively.

A particular need is to raise awareness amongst policy makers and planners of the benefits of woodland for water. For example, the potential of woodland to aid water management merits a much higher profile within River Basin and Sub-basin Management Plans, local farm plans, and Catchment Flood Management Plans. Woodland also deserves greater prominence within relevant water regulatory guidance, WFD Programmes of Measures and agricultural best management practice handbooks. Another key issue constraining progress is the lack of sufficient financial incentives to persuade landowners to plant woodland on higher value farmland, such as in the floodplain. Payments for water and related ecosystem services remain to be developed in the UK but a start has been made by using locational premiums to raise the value of woodland grants for securing land use change where water benefits are greatest.

While much remains to be done, recent experience suggests that forests and woodland will have an increasingly important role to play in the sustainable management of Europe’s water resources and helping to mitigate the impacts of climate change.
Short Biography
Dr Tom Nisbet is Head of the Changing Physical Environment Research Group within the Centre for Forestry and Climate Change in Forest Research. He has worked for the Forestry Commission since 1987 and leads the Commission’s forest hydrology research programme. His primary interests are in studying the impacts of forestry on the quality and quantity of water resources, and evaluating the effectiveness of good forest management practice and woodland creation in protecting and enhancing the freshwater environment and reducing flood risk. He has played a central role in the development of national forest and water guidelines and maintains strong links with end users through the provision of expert advice and involvement in key stakeholder groups.
Water protective forests in Russia

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Water protective forests grow at rivers’ and streams sources, on banks of lakes and streams also and on watershed areas determined the water content of basins. Water protective forests designated to regulate the water flow, to preserve water sources from silting up and river sides from erosion. In some degree, any forests possess water protective properties. However, some forests are crucial important for water bodies protection. These are forests of water protective zones.

Water protective zone is an area adjoining to coastline of seas, rivers, streams, canals, lakes and reservoirs. The width of water protective zones should be in accordance with the Water Code of the PF. For example, the width of water protective zone is established for the rivers or streams:
- up to 10 km length - at 50 m (each side);
- from 10 to 50 km length - equivalent to 100 m;
- of 50 km length or more – up to 200 m.

Widths of water protective zones of seas are 500 m.

The specific regime of management activity are established in the water protective zones in order to prevent contamination, damage and silt up of water bodies and depletion of water resources and to preserve the aquatic fauna and flora’s habitats and biological resources at whole (Part 1 of Article 65 of the Water Code of the RF).

Prior to the adoption of Forest Code of the RF in 2006, water protective forests were classified as first group protective forests’ categories and were mentioned in the forest legislation as protective forests along rivers, lakes, reservoirs and other water bodies and forest belts protected spawning areas of valuable fish.

In accordance with the Forest Code of the RF (2006) one category of protective forests was determined, namely:
- forests located in water protective zones;
- forests located in the first and second belts of sanitary protection zones of drinking water and household water supply sources;
- prohibited forest belts along water bodies;
- side protective and soil protective forests along the water bodies or at ravine slopes.

7.5% of forest estate of the Russian Federation was occupied by water protective forests according to the State Forest Account at 01.01.2008. Prohibited forest belts along water bodies are located at more than 55 million hectares.

Andrey N. Filipchuk, Doctor of Agriculture, Deputy Director for Science, professor and Head of the Forest Management and Forest Preservation Department of Moscow University of Forest, deals with the research on the use of new information technologies in forestry, remote sensing methods in forests explore, processing and analysis of information about forest store, as well as the activities of the International Centre for Forests, representing Russia at FAO as a FRA national correspondent.
Forest management and water quality

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In collaboration with INRA (National Research Institute on Agriculture) and the Economic Forestry Institute in Nancy, Private Forestry Federation is involved in a study on the development of a contract implementation method between users of drinking water and foresters.

Eric Toppan, will present on cooperation between water and forest managers in France, and will draw attention to the problem of improving water quality and the filtration role of forests.

The main objective of the French Private Forestry Federation is to demonstrate the importance of promoting experiences with contracts between water users and foresters in order to move towards better protection of water resources at a low cost!

The forest management can be contract-based. The main aim of the task force INRA/Private Forestry organization called “forest and water” is to develop contract implementation method between users of drinking water and foresters. The project is conducting econometric studies in order to quantify the economic gain in the medium term for water users, as compared to the alternative solutions of water treatment or switching to other supply sources. This action will be achieved in September 2009, with concretes results on demonstration sites.

**Short biography**

Eric Toppan graduated from the University of Sorbonne in Paris in 1997 with a post – graduate degree in Economics. Thereafter he went on to complete a Master’s Degree in Political Science.

His master thesis report has been realized during intern mission at the French Embassy in Italy. There after he started his career as a lecturer in economics at the University Institute of Sceaux between the year of 1997 and 2000.

Since 2000 he had been in charge of the Economics Affairs at the French Forest Owners Federation where he collates and analyses the main economic data. After 1999 storms, he had coordinated a study mission for the Ministry of Agriculture with the Forestry Development Institute on the Forest Insurance in France. He also conducted a study on the impact of different kinds of sales mode on the timber prices for the Ministry of Agriculture.

He is involved in several studies on forestry and carbon market.

Since 2006, he is the coordinator of the national observatory on forest and wood products with all the partners in the forestry and timber sector.