



**European Cooperation
in the field of Scientific
and Technical Research
- COST -**

Brussels, 21 November 2012

FP1206

MEMORANDUM OF UNDERSTANDING

Subject : Memorandum of Understanding for the implementation of a European Concerted Research Action designated as COST Action FP1206: European mixed forests. Integrating Scientific Knowledge in Sustainable Forest Management. (EuMIXFOR)

Delegations will find attached the Memorandum of Understanding for COST Action as approved by the COST Committee of Senior Officials (CSO) at its 186th meeting on 20 - 21 November 2012.

MEMORANDUM OF UNDERSTANDING
For the implementation of a European Concerted Research Action designated as
COST Action FP1206
EUROPEAN MIXED FORESTS. INTEGRATING SCIENTIFIC KNOWLEDGE IN
SUSTAINABLE FOREST MANAGEMENT (EUMIXFOR)

The Parties to this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 4154/11 “Rules and Procedures for Implementing COST Actions”, or in any new document amending or replacing it, the contents of which the Parties are fully aware of.
2. The main objective of the Action is to establish a long-lasting research network, which can contribute to the increase of knowledge, the sustainability of management and the future conservation and improvement of European mixed forests.
3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 64 million in 2012 prices.
4. The Memorandum of Understanding will take effect on being accepted by at least five Parties.
5. The Memorandum of Understanding will remain in force for a period of 4 years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of Chapter V of the document referred to in Point 1 above.

A. ABSTRACT AND KEYWORDS

Structure, dynamics and functioning of admixtures of tree species is a research topic of increasing relevance across Europe. The reason is that it is frequently suggested that mixed forests present (i) more resistance and resilience to human or non human disturbances, (ii) higher biodiversity levels (iii) higher carbon storage capacity and thus higher potential for mitigation strategies, (iv) better adaptation strategies to global change, and (v) higher productivity and support for ecosystem services. To date, these features have been studied separately for different mixtures of species, management practices and specific growing conditions. Consequently, the knowledge gained is local and a common and lasting European perspective on mixed forest sustainable management has yet to be developed. EuMIXFOR aims at creating a European research network on mixed forests, which can contribute to the increase of knowledge of adaptive forestry, the sustainability of management and the conservation and improvement of mixed forests to support rural development . The accomplishment of the objectives and the development and innovation activities involved in this Action will result in the definition of silvicultural recommendations that will help decision makers to promote the social, economic and environmental functions of European mixed forests.

A.2 Keywords: Mixed-forests, sustainable forest management, science-based knowledge, networking.

B. BACKGROUND

B.1 General background

European forests are a source of environmental benefits, employment and rural development. The estimated labour force in the forest sector was estimated in 2003 to be about 3.9 million people although shrinkage of 6.9 % was predicted (Blombäck et al. 2003). Current data showed that 2.6 million people are working in the whole sector in EU-27 (Forest Europe, 2011) and that, despite this reduction, the forest sector continues to be an important factor for employment in rural areas, because forests provide wood raw material for construction, paper and fuel wood, supplementary food and non-timber forest products, and contribute to carbon sinks and biodiversity enhancement, as well as to the increase of recreational and aesthetic values.

Mixed forests contribute to this picture as a fundamental source of ecosystem services as they are more resistant and resilient as long as the insurance hypothesis holds (Jactel et al. 2009), are

ecologically more productive as long as species have differences in height pattern, phenology, crown and root structure (Kelty, 1992, Paquette and Messier, 2010), provide more diverse goods and services and account for more structural and species diversity. The present steady decrease in Europe of single-species forests and a steady evolution towards mixtures of species (Forest Europe, 2011) could result in new job opportunities that may arise from the diversification of products and services provided by mixed forests in comparison to monocultures.

It is estimated that mixed stands of coniferous and broadleaves species occupy about 25% of forested land (Forest Europe, 2011). However, other reports classify near 40% of Europe's forests as mixed (MCPFE, 2003). This inconsistency clearly reveals a lack of a consistent understanding and definition of mixed forests in Europe. As an example, the definition of mixed forests is so lax that Lindén (2003) defined them as “anything but a pure stand”. In such broad terms, the European Forest Types (EFT) have many classes with stands built up by more than one species (EEA, 2006), though only one EFT explicitly refer to the term ‘mixed-forests’ (EFT2).

In addition, there is much more scientific knowledge devoted to monocultures than to admixtures. There is a long history of management of pure stands (i.e. forests with one single tree species or monocultures), and this experience has usually treated mixtures of species as if they consisted of a dominant species and secondary ones. This has led to the application of management treatments and rules to the dominant species while the others have been simply inventoried, monitored, or even removed if they were not economically valuable.

The lack of general management rules applicable in mixed forests is not the only threat for sustainability. The effects of rapid climate and socio-economic changes are expected to impact forest structure and functioning. In this changing context, maintaining the provision of ecosystem services of forests and reducing risks constitute the main challenge for forest managers and policy makers. In forestry this could be achieved by the application of silvicultural strategies oriented to enhance diversity of and in forests. Appropriate mixed-forests silviculture and management emerges as a primary need.

Landowners, forest managers, policy makers and other stakeholders are now facing the following paradigm: the increase of mixed-forest land; random natural hazards; multiple societal demands on the forest; and unemployment in rural areas, so information on aspects of mixed-forest management in Europe must be collated to fulfil the needs of a wide range of stakeholders.

EuMIXFOR will give the opportunity to forest partners (researchers, policy makers, stakeholders, small and medium-size enterprises (SME), and general public) to meet and discuss jointly the main concerns, needs, scientific and technological advances and future demands on mixed-forests. COST is the natural framework for EuMIXFOR because it aims at overcoming the dispersion and

fragmentation of existing research on mixed forests in Europe and other regions. The specific goal of networking to develop worldwide cooperation on mixed-species forests research is also within the scope of COST more than in any other frameworks. In addition, the Domain in which Forests, their Products and Services are recognized guarantees the appropriateness for this Action. The networking will give relevance to the Action as it will be continuously monitored by all partners. Launching EuMIXFOR as a COST Action is also a powerful showcase for individual findings of local research groups in order to create synergies and foster future transnational collaborations. As a result of networking and knowledge EuMIXFOR will support capacity-building in those regions where research on mixed forests is recent by knowledge sharing with other regions where information is better developed. In addition, discussion and information exchange will give added value and insights for all research groups of how mixtures of species perform in contrasted climates and regions and on methodologies for effective experimental design and analysis. Social demands and local job opportunities can be best identified using both European and global contexts, in which lessons learned in one region, can be adapted to another. This can only be achieved within the COST framework.

B.2 Current state of knowledge

Mixed forests dynamics, structure and functioning is a research topic of increasing importance and the effects of silviculture in mixed-species forests have been explored, but the European research on mixed forests have been limited to specific regions so far. Past and current knowledge and technological advances must be now integrated to get a better understanding on how these forests can face global change, and guarantee the maintenance of multiple environmental services. The scientific interest on mixed forests has already produced reviews and case studies on silviculture and management of mixed-species stands (Kelty, 1992), and a summary of practices in Western Europe (Olsthoorn et al. 1999). Recently, the linkage between biodiversity and functioning (Scherer-Lorenzen *et al.* 2010) has been identified as a hot research topic on mixed forests. The promotion of mixed stands of well adapted species has been identified as an important adaptation measure for European forests facing projected climate change (Kolström et al. 2011). Recent studies underline the importance of species diversity for most forest functions and services (Hector and Bagchi 2007). Particular interest receives the relationship between species diversity and productivity (Piotto 2007, Morin et al. 2011, Zhang et al. 2012), as the latter is a key variable for ecology, economy and sustainability (Scherer-Lorenzen et al. 2005). Many studies describe an overyielding of mixed versus pure stands due to continuous facilitation or stress-release under

episodic stress (Pretzsch et al. 2005, 2010, Richards et al. 2010). However, to date there has been no concerted attempt to create a permanent platform or observatory on mixed-forests.

This Action recognizes that the promotion of mixed forests can contribute to ease the negative effects of environmental change. For example, an adaptation policy measure of increasing mixed-forest land by planting mixtures instead of monocultures could reduce their stress profile (Kellomäki et al. 2000). This role has led to recent research on European mixed forests devoted, among others, to competition (Pretzsch, 2009) or growth modelling (Portier and Bartelink, 2002) whereas overseas the maximum density concept has been analyzed (Ducey and Knapp, 2010) and the carbon sink capacity of mixed forests is under investigation (Woodall et al., 2010).

Several European research activities have touched separately silviculture and biodiversity in mixed forests. FP3 project AIR32149: Management of mixed-species forests: silviculture and economics is acknowledged to be the first state of the art on mixed forests, and its objective was to stimulate and to coordinate research related to the management of mixed stands, including growth, economic aspects and modeling. However, the lasting network capacity, which is being explicitly stated in EuMIXFOR and the social and biodiversity dimension were overlooked. SilviStrat project (FP5) identified that control of species composition can be a valid strategy for adaptive forest management; an issue that was previously explored at EFI project ConForest, that recommended the conversion of Norway spruce forests to more diverse structures. ESF Collaborative research projects on mixed forests or biodiversity are currently lacking, and although past ESF actions, like EuroDIVERSITY, made important advances in studying biodiversity, they did not take into account explicitly mixed forests.

Alter-Net was originally funded by FP6 to assess changes in biodiversity, analyze the effect of those changes on ecosystem services and inform the public and policy makers about this at a European scale. Today Alter-Net is an independent network. The scope of EuMIXFOR is beyond its remit as the Action encompasses management practices and social issues involving mixed forests.

EuMIXFOR does not aim to assess changes in biodiversity directly. It must be considered as a complementary network in which policy makers and public are not merely informed, but actively form part of the network.

TreeDivNet is a world-wide network comprised of several projects to study the relationship between forest/tree biodiversity and ecosystem functioning. The long-term experiments BIOTREE and the FORBIO project that studies the role of tree diversity in ecosystem functioning of temperate forests in several European countries are part of this network. Despite this unique collaborative research, ongoing research on European mixed forests is rather local and dispersed. Examples of ongoing research are the studies on inter- and intra-species competition in Germany, growing

efficiency of Norway spruce-European larch stands in Austria, nutrient cycling and growth response to climate in managed oak-pine stands in Spain, inter alia. The knowledge gained in these studies will ultimately be disseminated in scientific journals. However, EuMIXFOR thinks that the increasing importance of mixed forests at a pan-European scale justifies accelerated sharing of information, methodologies and findings at earlier stages so that the accumulated knowledge can help other researchers and practitioners in their own activities relevant to mixed forests at almost real time.

EuMIXFOR believes that the scattered information available in individual member states and the need for better knowledge on mixed-forests requires the development of an integrated common action. The foundation of this common action is networking capacity and it will be supported by Information and Communication Technologies that will play a major role in the innovative aspect of this COST Action. Model platforms and software will be used to implement all the existing management options for mixed-forest management. A great effort will be devoted to communicating and disseminating the knowledge acquired during the COST Action to the general public and primary stakeholders, by creating accounts on social networks to disseminate results and to serve as an exchange platform between partners.

B.3 Reasons for the Action

The Oslo Ministerial Decision European Forests 2020 recognized that ‘forests have a preeminent role in contributing to solving environmental challenges, while responding to the need for raw and renewable material and maintaining the ability of Europe’s forests to contribute to the quality of life and the well-being of people’. EuMIXFOR believes that mixed-forests can fulfil this role and helping to the accomplishment of the following FOREST EUROPE tasks, which is considered an important added value:

- Updating tools for sustainable forest management of mixed-forests. Including active participation by primary stakeholders, and cooperation and coordination among forest partners.
- Monitoring and assessing sustainable forest management in European mixed forests by regions and as a whole according to Pan-European indicators.
- Identifying where and how to convert single species stands into mixed stands and how to assess its impact upon sustainable delivery of ecosystem services.

- Specifically to ‘promote education, research and the use of scientific knowledge and facilitate sharing of experiences across countries, sectors and stakeholders on all aspects of sustainable forest management of mixed forests and other forest related issues’, like job opportunities and rural development.

This COST Action is a network of experts whose benefits arise from the networking between partners that permits updated reports on sustainable management of mixed forests. It targets societal needs through application of scientific and technological advances and its objective is to establish a lasting network to increase the knowledge, the sustainability of management, and the future conservation and improvement of mixed forests on the basis of science, innovation and rural development. The network activity will produce regular outcomes, like annual reports and fact sheets, whose visibility and impact is supported by the COST framework, along with scientific reviews and collaborations that will emerge from the networking activities.

Although this Action is not conceived as a trans-domain Action, it could easily interact with other domains like ISCH (Individuals, Societies, Cultures and Health) as forests are part of the cultural perspective and social participation is in the core of the Action. Other related domain is ESSEM (Earth System Science and Environmental Management), as EuMIXFOR will collect natural resource management practices that in some cases are oriented to diminishing environmental degradation. The Management Committee of this Action will be responsible for seeking such interactions.

B.4 Complementarity with other research programmes

At the European level the Action will profit from existing results to integrate knowledge on silviculture, biodiversity and forest management, and public use in order to complement ongoing research programmes like TreeDivNet or ALTER-Net.

Major complementarities are found with FunDivEUROPE, which is a collaborative project within the FP7 which investigates the role of forest biodiversity for ecosystem functioning and the provision of goods and services. EuMIXFOR will concentrate in both aspects in mixed forests with implications for management and rural development. The international scope of the Action with the inclusion of Non-COST countries will expand synergies between parties. In addition, there is potential cooperation with the FP7 project BACCARA that aims at evaluate the risk of European forest biodiversity and productivity loss under climate change. The same can occur with FP7-project MOTIVE in which adaptive forest management measures involving climate and land-use

change are being investigated.

EuMIXFOR is also closely related to past COST Actions. The role of mixed forests in mitigation strategies as well as the adaptation capacity of admixtures links this Action to FP0703 ECHOES. In addition, the ability to model development of mixed stands is important to understand forest dynamics and lay within the scope of FP0603 Action on forest models and decision support tools. This Action also incorporates several objectives found in the Strategic Research Agenda (SRA) of the Forest-Based Sector Technology and the Mediterranean Forest Research Agenda (MFRA) by meeting the multifunctional demands on forest resources and advancing knowledge on mixed forest ecosystems.

C. OBJECTIVES AND BENEFITS

C.1 Aim

The aim of the Action is to establish a long-lasting European research network on mixed forests, which can contribute to the increase of knowledge, the sustainability of management, and the future expansion, conservation and improvement of mixed forests on the basis of science, innovation and rural development in Europe.

C.2 Objectives

The objectives of the Action are established accordingly to three actors that operate on mixed forests: policy-makers, managers/owners and users, altogether linked by scientific community. The specific objectives are:

1. To provide a sound overview of the role that mixed forests can play in the provision of environmental services in each of the following European bioregions: Boreal, Atlantic temperate, Continental temperate, Mountainous and Mediterranean. A complete state of the art would include a comparison with other regions worldwide.
2. To address how mixed forests can face environmental challenges affecting the needs of rural, peri-urban and urban population, analyzing barriers to adaptive changes, threats and opportunities.

3. To identify objective-oriented silvicultural practices and decision tools (e.g. decision support systems) for the creation and an adequate sustainable management of heterogeneous forest for the present and future provision of ecosystem services, in order to enhance rural development, and
4. To establish different actions, such as standard protocols, common methodological approaches and experimental designs to create a research network in the public domain, to facilitate the share of experiences conducted in mixed forests, and the dissemination of their main results, accessible to policy makers, managers/owners and users.

C.3 How networking within the Action will yield the objectives?

Networking will promote the accomplishment of objectives by sharing experiences and research results. Parallel to the objectives of section C.2 the networking will yield:

1. Gathering of past and recent research on mixed forests. Experts from the bioregions described above will expose their experiences and perspectives on how mixed forests can provide ecosystem services in comparison to other types of forests. Researchers involved in mixed forest experiments will be invited and supported to contribute with research information to achieve truly knowledge sharing.
2. Identification of environmental and social challenges like climate change, pest outbreaks and human impact on mixed forests, the perception of the economic and ecological role of mixed forests by end-users, the attitude of forest owners to change management practices and economic and institutional changes that can affect the provision of goods and services. Local and regional authorities, landowners, small and medium-size enterprises, researchers and other stakeholders will use the network to discuss how mixed forests can face such challenges.
3. Forest managers will play a major role in the accomplishment of this objective as they will be invited to present and discuss current management practices in their bioregions. Networking will confront research findings on how mixed forest responds to different management options. A consensus will emerge on the identification and recommendation of sustainable practices to provide ecosystem services.

4. Harmonization of protocols across Europe to carry out research and analyse results in mixed forests like tree diversity studies, ecosystem services monitoring and/or silviculture effects will make scientific results comparable. In order to make results useable policy-makers and forest managers will participate in the networking.

C.4 Potential impact of the Action

The major potential impact of the Action is the development of multifunctional sustainable forest management oriented to the promotion of heterogeneous stands that provide stability in the view of global change. Additional and important benefits that stem from the Action include:

- A consistent definition of mixed forests and its plausible inclusion in European Forest Statistics that would help monitoring of natural resources
- Clarification whether and on which sites mixed forests perform better than pure stands
- Identification of the ability of mixed forests to cope with environmental challenges
- Identification of job opportunities due to diverse production of goods and services that expand the economic scope of single-product forest management
- Estimation of differences of growth and dynamics between mixed forests and pure forests based on experimental studies
- Increased visibility and promotion of this type of forests which account for at least 25% of European forests
- Cooperation across European Research Institutions, not only in the forest sector but also in the social science
- Transfer of knowledge and experience gained in mixed forests among research community, forest managers, policy makers and end users by integrative management guidelines
- Lasting collaboration among European, near neighbour and overseas research groups

- Continuous updating of knowledge on mixed forests

C.5 Target groups/end users

According to the aim, objectives and impact of the Action the target groups are: (1) policy makers who will gain updated information on mixed forests in their respective bioregions, (2) forest managers and landowners that will receive sustainable management guidelines, (3) forest scientists and researchers who can contrast their local experiences with other groups, (4) companies and small and medium enterprises that will identified business opportunities in mixed forests and (5) people from both, rural and urban areas, as end-users, who could ultimately benefit from the ecosystem services, job opportunities and stability offered by mixed forests as identified by this COST Action.

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

The scientific programme of this COST Action combines research, development and innovation. Recognition of common research lines is a first step to start fruitful cooperation between groups and identification of end-users needs. Creating an experimental research network, based on established experimental plots across Europe, will help to exchange knowledge between the parties.

Information and Communication Technologies will play a major role on the innovative aspect of this COST Action. Model platforms and software will be used to implement all the existing management models for mixed-forest management. A great effort will be devoted to communicating and disseminating the knowledge acquired during the COST Action to the general public and primary stakeholders.

The Action will be structured in multidisciplinary open work packages. Each work package includes different tasks. The criteria to evaluate the performance of the Action will be the accomplishment of such tasks. It is important to note that the Action is open and flexible to allow incorporating new tasks if scientists from other disciplines (i.e. social sciences) join the Action once started. However, the effectiveness of the implementation of a new scientific task must be monitored and approved by the Management Committee.

D.2 Scientific work plan methods and means

This COST Action is structured in three work streams or themes in which scientific issues must be debated. These are:

Understanding: European forest managers and their stakeholders need clear and sound information on mixed forests stand dynamics. Questions on how mixed forests can cope with global change and its impact on environmental services can be best examined under a European framework.

EuMIXFOR will summarize what it is known about mixed forests and advance in the comprehension of what it is not known.

Management and rural development: Management of pure stands has been widely reported by the scientific community, but integration of functions in mixed-forests, based on stakeholders' perceptions and social demands analysis, calls for specific management practices. These management practices should be based not only on the technical feasibility and on the positive attitudes of landowners and managers towards changes, but also on the social acceptability of their consequences. This COST Action will confront questions such as: how to establish mixed stands or to turn monospecific stands into more diverse ones in a sustainable way?, which mixtures should be used for which objectives?, are new models necessary for multifunctional sustainable management of mixed forests?, how can mixed forests management and establishment contribute to rural development?.

Future: All actions in EuMIXFOR must be monitored in order to evaluate and adapt management prescriptions in the future. To address this problem this Action will establish the principles of a common research network on European mixed forests to continue after Action has been completed. Integration, collaboration and networking will dictate EuMIXFOR work, in order to provide forest landowners and users with scientific-based guidelines on mixed forest management.

The work plan consists of the achievements of work packages during the time life of the Action. Work packages presented here can be expanded if researches from other domains join the Action during the implementation phase. Work packages are independent scientific issues whose complete accomplishment will mean the success of the Action. Independence does not mean that participants must assign to a unique work package. On the contrary, participants can contribute to complete several work packages. The way participants will complete the work packages is by finishing tasks. The work in each task will be defined in a kick-off meeting, and it will be evaluated and monitored in workshops during year 2 and 3 of the Action. A final meeting will wrap-up all findings in a Open International conference.

The implementation and accomplishment of the scientific program and tasks will be carried out by

three Working Groups (WGs):

- Working Group 1 (WG1), Mixed forest dynamics and functioning, the members of this WG will concentrate on the analysis of the effects and impacts of the different components of global change on mixed forests (stability, biodiversity and environmental services). They will gather all relevant knowledge about the impacts of global change on European mixed forests and will identify gaps and research opportunities.
- Working Group 2 (WG2), Adaptive management of mixed forests, this WG will compare current forest management applied in pure stands and mixed-stands. Models, decision support tools and silvicultural practices to promote and maintain mixed forests in Europe will be analyzed. Identification of ‘good practices’ and recommendations on sustainable forestry and rural development will be established.
- Working Group 3 (WG3), Policy and Social Impact of mixed forests, the goal of this WG will be to identify policy measures to enhance job and business opportunities in mixed forests, as well as fulfil social demands on ecosystem goods and services.

The work packages and tasks to be accomplished under the themes of the Cost Action are *Understanding*.

Work package U1: Starting

- Task 1. Kick-off meeting. Implementation.
- Task 2. Assignment of participants to Working Groups.

Work package U2: Preliminary analysis of mixed forests (All WG)

- Task 1. Consistent definition of mixed forests
- Task 2. Identification of ‘target’ mixed forest classes (categories and types) within the European Forest Types classification
- Task 3. Description and analysis of the state of the art in Europe
- Task 4. Comparative hot topics between Europe and other regions

Work package U3: Mixed forest functioning (WG1)

- Task 1. Identification of key functioning processes in mixed forests.
- Task 2. Summary of research topics on mixed forest functioning.
- Task 3. Identification of knowledge gaps.

Work package U4: Environmental challenges (WG1/WG2)

- Task 1. Identification of impacts.
- Task 2. Identification of mitigation options.
- Task 3. Definition of adaptive measures.

Management and rural development

Work package M1: Provision of environmental services (WG1/WG2/WG3)

- Task 1. Quantification and valuation of environmental services.

Work package M2: Sustainable forest management in mixed forests (WG2)

- Task 1. Identification of sustainable forest management practices.
- Task 2. Compilation of management tools applied to mixed forests.
- Task 3. Guidelines for sustainable forest management of mixed forests.

Work package M3: Rural development (WG3)

- Task 1. Identification of social demands from mixed forests
- Task 2. Identification of business/job opportunities in mixed forests:
- Task 3. Strengthening liaisons between science, forest managers and policy-makers.

Future

Work package F1: Communication and Dissemination (All WGs)

- Task 1. Extension seminars and local meetings.
- Task 2. Information notes and fact sheets.
- Task 3. Design and Maintenance of an Internet-based platform.
- Task 4. Short Term Scientific Missions and Training Schools.

Work package F2: Creation of a network on mixed forests (All WGs)

- Task 1. Definition of Rules and Procedures for a lasting network on mixed forests.
- Task 2. Definition of future research needs on mixed forests.

Promotion of early-stage researchers and PhD students according to a gender balanced scheme will be treated by Short Term Scientific Missions every year and training schools taught by senior scientists once a year.

E. ORGANISATION

E.1 Coordination and organisation

EuMIXFOR organisation will be reduced to the minimum necessary to accomplish the objectives and to reduce coordination costs. It will consist of a Management Committee (MC) formed by representatives of all institutions interested in the Action and will lead and coordinate the Action as well as guarantee the gender equality, to promote and ensure networking and to integrate early-stage researchers. The MC will delegate the detailed planning, execution and monitoring of tasks, as well as other responsibilities agreed, to a Steering Group (SG). The duties of the SG will be done by the Chairperson of the COST Action, a ViceChairperson, and Working Group leaders. In order to minimise coordination costs meetings of the SG will be coincident with annual meetings or video conferences otherwise.

Coordination of the Working Groups will be led by Working Group leaders and deputies. The Leader must assure collaboration within WGs and will promote research reports and scientific publications within the Working Group tasks, and report the progress of the WG to the SG. A Deputy in every WG will organize WG workshops and ensure cross interactions among participants from different Working Groups, as well as promote the applications for Short Term Scientific Missions.

E.2 Working Groups

Working Groups will be opened to members of all interest groups. Researchers, Forest managers, landowners, companies, small and medium enterprises, policy-makers and users can integrate each of the previously defined Working Groups:

Working Group 1. Mixed forest dynamics and functioning. The role of this WG is mainly devoted to the gathering of scientific goals on mixed forests dynamics with special emphasis on the impacts of environmental challenges. Researchers are the main group of interest in this WG, although forest managers, policy-makers and users can also integrate it.

Working Group 2. Adaptive management of mixed forests. Forest managers and policy-makers should be active in this WG. Their collaboration with forest researchers is essential to the accomplishment of objectives. Companies, SME, users and scientists from other fields will give added value to the recommendations of good practices in mixed forests.

Working Group 3. Policy and Social Impact of mixed forests. Social scientists, policy-makers and forest managers are welcome to this group. Their tasks will be devoted to user's preferences on mixed forests' ecosystem services and rural development, including the identification of business and job opportunities. The number of WGs has been reduced to the minimum because otherwise this will inflate the steering committee, which must be an efficient body of control and monitoring of the Action. Working groups are the minimum unit of organisation. However, the nature of the tasks can recommend splitting the Working Groups into task forces in order to make more efficient the accomplishment of objectives. All Working Groups must assure the implementation of the network that will serve as a showcase for: ongoing and future research activities, business and job opportunities in mixed forests and visibility of forest management and policy.

The Leader and the Deputy of every WG will assist in the following tasks:

1. A kick-off meeting at the beginning of the Action.
2. Annual workshops in the framework of the annual meeting of the Action COST. During the annual meeting the Working Groups will hold workshops to discuss the advancement, pros and cons of the tasks assigned during the kick-off meeting. At the end of the workshops there will be a plenary session in which achievements will be discussed.
3. Local seminars and training schools prior or in parallel to the annual meetings.
4. Open International Conference at the end of the Action

E.3 Liaison and interaction with other research programmes

EuMIXFOR pursues the implementation of a network on mixed forests. This network must not be seen as independent network from ongoing research programmes like TreeDivEurope or Alter-NET. Representatives of these networks already participate in or will be invited to participate in this Action. In addition, common demonstration visits to experimental sites in mixed forests will allow the exchange of information and the definition of research opportunities and interactions between networks.

Ongoing KBBE FP7 projects under the activity 2.1 ‘Sustainable production and management of biological resources from land, forest and aquatic environments’ can benefit from the results found in this Action. Discussion with project leaders involving forests will be encouraged in joint scientific seminars. In addition, networking will identify research gaps that can derive in research projects eligible within KBBE activities.

E.4 Gender balance and involvement of early-stage researchers

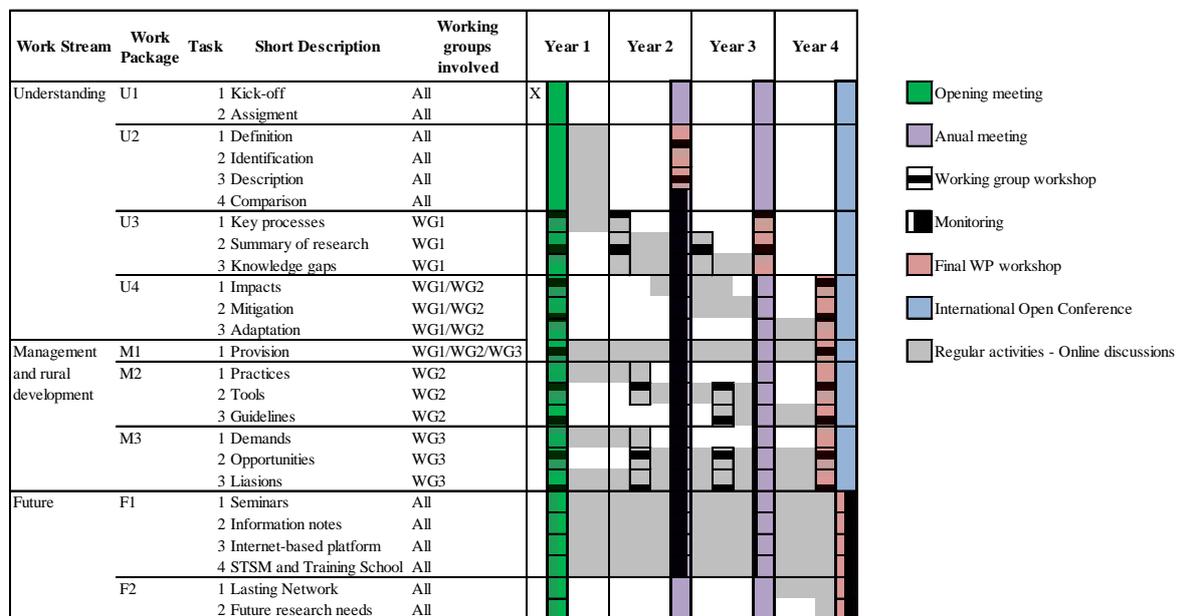
This COST Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. The Action will also be committed to considerably involve early-stage researchers. This item will also be placed as a standard item on all MC agendas.

Gender balance is included as a compulsory item from the beginning of the Action. The

Management Committed will promote an equilibrated representation of gender within the Steering group and working group leaders and deputies. The involvement of early stage-researches is demonstrated by the explicit promotion of Short Term Scientific Missions and training schools oriented to early-stage researchers. STSM applicant’s proposal will be evaluated in terms of feasibility and scientific interest for the hosting institution and for the Action objectives. During annual meetings and in the final Open Conference beneficiaries of a STSM are invited to present the results of their stage.

F. TIMETABLE

The time duration of this Action to accomplish all the objectives is four years. The detailed timetable is as follows:



A brief description of the timetable is as follow:

Year 1: During the kick-off meeting, the assignment of participants to Working Groups will maintain gender balance. During the opening meeting work package U2 will start although its fulfilment could be expanded during the first year. Working group workshops will be held also during the opening meeting to start discussion and task assignments between participants. Short Term Scientific Mission call for the Action will be launched.

Year 2 and Year 3: Working groups will be held independent workshops in order to analyze the implementation of the tasks and advances. Recommendations on how to accomplish tasks will be also discussed. Regular working activities within WG objectives will be carried out (i.e. seminars with local stakeholders, web platform and social network activity, video conferences...). STSM will be launched annually. At the end of every year an annual meeting and training schools for young researchers and plenary sessions will be held. At year 2 joint WG workshops for those work packages in which two WGs are involved will be performed during the annual meeting.

Year 4: Regular working activities within WG objectives and STSM will be carried out during the year. Final working group workshops will be held in order to summarize results previous to the International Open Conference on mixed forests.

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: AT, BA, BE, CZ, DE, ES, FR, IT, NO, PL, PT, RO, SE, SK, TR, UK. On the basis of national estimates, the economic dimension of the activities to be carried out under the Action has been estimated at 64 Million € for the total duration of the Action. This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

H. DISSEMINATION PLAN

H.1 Who?

The audience of this COST Action is broad. Researchers from the following fields are identified as primary targets: Forestry, Ecology and Sociology and Economy. Undergraduate and post-graduate students will be an active target of the dissemination plan. Regional planners and policy makers, forest managers and landowners will gain assets from the results of the Action. The general public and end-users, with special emphasis on rural areas, will have more knowledge about mixed forests dynamics and opportunities from them. Other COST Action and research initiatives can benefit from the dissemination of results.

H.2 What?

A website will be enabled in which general information of the network will be posted. The information will give a first glance about the state of the art of mixed forests research and how mixed forests can cope with environmental challenge. Recommendations for policy makers and forest managers will be included. In addition, EuMIXFOR activities will be announced in the website. This information is valid for all audiences.

Newsletter will be created every four months and published electronically on the website. An optional webmail list will be created for those interested in receiving the newsletter in his/her mail account.

Part of the website will be devoted to share information between scientific members of the network. An intranet will be created as a discussion forum within and between WGs. Topics will be highlighted by moderators in order to analyse research gaps.

A social network account will be created in order to exchange network real time activities.

Meetings, conferences and findings will be posted. Audience can follow regular network meetings in this account.

The networking capacity may allow the publication of joint results in scientific and/or technical journals, as well as edited books.

H.3 How?

The dissemination of the results will be addressed in:

- A Report for every work package: the state of the art of mixed forests in Europe, Mixed forest functioning and dynamics; Impact, Mitigation and Adaptive measures in mixed forests; Economics and end-user's preferences of mixed forests; and Mixed forest opportunities for job and business in Europe. The main issues to be disseminated will be among others: ecosystem services provided by mixed forests, relative economic importance within the forestry sector, available management options and current objectives, social dimension and new opportunities of mixed forests. This report will be updated annually during the course of the Action and a final integrated report will be presented in the International Open Conference.

- Annual fact-sheets on Action activities, it will serve to inform how the Action's objectives are being accomplished. New findings and relevant news about forestry sector and mixed forests will be included.
- Local seminars with policy-makers, forest managers/landowners and end-users to extend the outreach of the Action
- Proceedings of the annual meeting in which presentation, discussion fora agreements, STSM results and Working Groups' workshops will be presented.
- Regional case studies of mixed forests management and research. Preliminary results of ongoing research activities can be included.
- Scientific and Technical publications involving research on mixed forests at the European scale and/or comparison with other regions.
- Guidelines for decision makers, forest managers and landowners for sustainable and adaptive management of mixed forests.
- A journal special issue and/or an edited book dedicated to mixed forest sustainability.