



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

Brussels, 21 November 2012

FP1204

MEMORANDUM OF UNDERSTANDING

Subject : Memorandum of Understanding for the implementation of a European Concerted Research Action designated as COST Action FP1204: Green Infrastructure approach: linking environmental with social aspects in studying and managing urban forests

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 FP1204
GREEN INFRASTRUCTURE APPROACH: LINKING ENVIRONMENTAL WITH
SOCIAL ASPECTS IN STUDYING AND MANAGING URBAN FORESTS

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 increase the understanding on the role of Urban Forestry in the context of Green Infrastructure in terms of ecosystem services provision.
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 88 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

Green Infrastructure (GI) has recently gained prominence as a planning tool at regional and local levels. GI provides a range of ecosystem services, and new initiatives can build on state-of-the-art research and on delivery mechanisms such as urban forestry (UF). However, greater attention is needed on integrating the environmental and social benefits produced, particularly in the context of climate change adaptation and mitigation. The COST Action aims to: 1) increase the understanding of the role of UF in the context of GI from a scientific and a socio-economic perspective, in terms of the ecosystem services provided to people and to the urban environment; 2) to identify priorities and challenges for future research in the field; 3) to provide indicators and/or thresholds to be included by policy makers in local, national or international regulations about GI and UF; 4) to develop guidelines for GI planners and managers on how to implement GI approaches with an emphasis on linking the environmental and social services of UF.

Undertaking a COST Action on this topic is crucial because of the diversity of GI and UF approaches at European level and because of the need to create a structured interaction among scientists, citizens, policy makers and managers.

A.2 Keywords: Green Infrastructure, Urban forestry, ecosystem services, climate change, governance

B. BACKGROUND

B.1 General background

Green infrastructure (GI) is becoming established as an urban planning mechanism and is recognized at international level (e.g. EU) as an important development in ecological and urban sustainability (E.C. 2010). The development of an EU strategy for GI figures prominently in the EU's post 2010 biodiversity policy (E.C. 2010). This is because GI provides a range of benefits (or ecosystem services).

In terms of environmental services, GI is viewed as one of the main tools which can be used to tackle threats to biodiversity resulting from habitat fragmentation, land use change and loss of habitats (EEAC Biodiversity Working Group, 2009). Attention is also increasingly being given to the environmental services provided by GI in the context of climate change adaptation and mitigation. Urban forestry (UF) can contribute to the improvement of the urban environment

through a number of mitigation actions. A well-structured urban forest mitigates temperature, decreases acoustic pollution, water run-off and soil erosion, absorbs air, soil and water pollutants. The improvement of climatic conditions in the urban environment is related to both shading and evapotranspiration, decreasing temperatures and mitigating the “heat island effect” in the city during the summer. Moreover, a reduction of heat dispersion from buildings during the winter, due to sheltering and windbreak effects can be observed. By lowering air temperatures in the summer, indirect CO₂ savings are made through the reduction of energy consumption for air conditioning especially in warm climates. In addition to this indirect saving, plants are also responsible for direct CO₂ savings through sequestration. It is this fact that is driving the post-Kyoto processes of afforestation and acquisition of credits throughout the world.

In particular, in several countries, the establishment of new forests in urban environments seems to be increasingly motivated by the Voluntary Agreements Market for CO₂ compensation as opposed to the more traditional system of publicly funded woodland creation. Therefore, it is important to consider the contribution that UF can make to the reduction of carbon dioxide, as well as to atmospheric pollutants, such as several oxides, hydrocarbons and particulate matter. Thus, while creating/improving GI leads to benefits at the local level, it also impacts on environmental and social advancement at the global level.

It is acknowledged that, alongside environmental services, GI can also provide a number of social benefits, or cultural ecosystem services in the urban environment.

UF and GI create opportunities for recreational activities which contribute to people’s health, well-being and quality of life, particularly in relation to their capacity to provide environments which help to alleviate stress and mental fatigue. The aesthetic qualities they bring to areas can also help improve people’s sense of place and make places more appealing to live and work in. It has also been suggested that GI can have a positive impact on social interaction and inclusion, providing spaces for use by the whole community. Furthermore, UF resources are valuable resources in terms of education and learning, helping people to ‘re-connect’ with nature and educating them about its continued relevance in their lives.

Another important aspect is related to wood as an energy source. The EU Renewable Energy Directive has now entered into force and interest in energy from forests is growing. However woody resources from urban forests are rarely treated as an energy source and in several countries they are even considered a waste product, representing a cost rather than a resource for the urban population.

While the importance of the aforementioned benefits is recognized at the international level, it is clear that often different priorities exist within regions, countries and local areas. This suggests that

an international network, such as one established within a COST Action, will be crucial in order to develop the best practices for the maximization of those benefits, coupled with a thorough understanding of local conditions, which should be considered when implementing those practices in different cities. Moreover, there is a need to develop common approaches to the identification and valuation of the products, services and benefits that are provided by UF.

B.2 Current state of knowledge

Urban forestry (UF) has been recognized as an effective delivery mechanism for realizing GI because it can provide economic, social and environmental services in a socially-inclusive manner. A number of studies have shown the social benefits of trees and that their presence can reduce stress, improve human health and well-being, and encourage interpersonal relations. A recent study indicates that people living in urban areas are generally less healthy than people living in areas that are more natural. They argue that green spaces are more than just a luxury, but are rather a requirement to maintain or improve the health of urban populations. There is a growing body of research on the management and promotion of open spaces in towns to encourage social integration and inclusion, especially with regard to ethnic minorities, immigrants and vulnerable people. Urban trees and forests also contribute to the improvement of environmental conditions because of their ecological properties and their multiple mitigation effects. Trees can influence the microclimate, reducing the heat island effect in the summer and preventing an excessive cooling in the winter. Trees can also help to reduce CO₂ levels in the atmosphere through both direct uptake and indirect energy savings related to microclimate effects. Urban trees can also absorb soil and air pollutants, making the environments where most people live more healthy. Trees can also help in the control of stormwater and in reducing noise. In some urban areas there is also a growing interest in using trees to provide biomass as an alternative energy source to fossil fuels, and thus to help to reduce emissions.

In some circles, and with increasing policy influence, these benefits are referred to as ecosystem services, a concept which includes ‘provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide for example recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling’ (Millennium Ecosystem Assessment, 2005). Unfortunately, many of the studies demonstrating these social and environmental benefits have been carried out in the US, often with the use of models. The structure of cities and urban forests and even the trees species in the US differs quite considerably to those in Europe. This

suggests that the models built in the US need to be adapted to the European context. It also implies that additional measurements are needed in order to have a more accurate estimation of the real mitigation capacity of urban trees in the European context, since the growth rate and the allometry of urban trees in Europe is currently largely unknown.

This Action will collate current knowledge on predicting and quantifying ecosystem service provision from proposed or planned GI and UF initiatives, and stimulate further research on best practice approaches for valuation of these services, in order to create new models or refine existing ones.

Another important research activity which the Action would foster is represented by the investigation of climate change effects on GI and UF. Climate change effects are often exacerbated in urban areas and in relation to the effects on trees, this is a poorly investigated area. It requires research which examines selected cultivars or genotypes specifically adapted to perform well in conditions such as heat shocks, increased drought stress and increased pollutant levels.

B.3 Reasons for the Action

It is known that about three quarters of people in Europe live in urban or periurban areas. While many people greatly value forests within or around cities, especially for recreational purposes, the majority of urban citizens, as well as many of those who have a central role in planning and managing those forests are not aware of the multiple benefits that these forests can provide. Scientists who actively work in this field are now able to distinguish a number of economic, environmental and social benefits that these forests can provide and, in some cases, are able to quantify those benefits and place a monetary value on them. A major effort is required at both research and dissemination levels in order to translate this scientific knowledge of best practice for different stakeholders. In this respect, in Europe, it is important to also promote the concept of the Urban Field Station, developed in the USA. The Station is designed as a center of excellence in urban natural resources stewardship, serving to promote adaptive management, technology transfer, and science, to improve people's lives and to improve the environment. The Station is a physical place for research and technology transfer and a virtual network of relationships among scientists, educators, practitioners, university cooperators, and facilities for urban ecology.

Furthermore, a stronger evidence base is also needed at the European level in order to address the threat posed by climate change to UF. In the future, across Europe there will be changes in climate, often with warmer temperatures, higher pollutant levels and drier summers, especially in southern climates. Thus the adaptation mechanisms of trees and plants need to be understood in order to plan

and manage future urban forests accordingly. At the same time, the environmental services described above should be considered in local level mitigation strategies, as well as in the context of global change.

This topic has important implications at a European level considering that on 29 January 2008, the European Commission launched the Covenant of Mayors. This Covenant obliges European cities to establish an Action Plan to reduce their CO₂ emissions by over 20%, through activities and practices including the addition of more trees in urban areas and the sustainable management of green spaces. Thus, one outcome of the Action will be the quantification of CO₂ sequestration capacity by urban forests, by taking a number of cities at the different latitudes as case studies and adapting and using tools, such as those produced and used within the USA.

Furthermore, thresholds have been established in several European countries for mean concentrations of several atmospheric pollutants in urbanized areas, in order to control emissions and to protect human health. Experimental data has underlined the effectiveness of UF in absorbing air pollutants and carbon. Thus a goal of the management of urban forests should be to maximize the capacity of trees for absorbing pollutants and greenhouse gases, in order to have direct effects on human health as well as indirect economic benefits.

Another goal of this Action is to promote the implementation of best practices for UF to ameliorate forest ecosystem services; some examples are: to promote new tree plantings, especially in areas with few green spaces, high pollution concentration and high population density; to choose evergreen trees, to have a permanent in-leaf period and consequently a major absorption capacity; to prefer long-lived trees with high growth rate, increasing the CO₂ sequestration capacity; to choose species tolerant to high concentrations of atmospheric pollutants in highly polluted areas in order to guarantee a good growth rate, a good biomass production for energy purposes, and a good absorption capacity of pollutants.

In light of the proposed goals, this Action aims to meet European economic/societal needs (e.g. providing guidelines to reduce CO₂ and pollution levels), as well as to make advances in science and technology (e.g. exploring mechanisms of pollution removal and identifying the most suitable tree species to adopt in GI initiatives).

B.4 Complementarity with other research programmes

A European Project within the Seventh Framework Programme called HEREPLUS, “HEalth Risk from Environmental Pollution Levels in Urban Systems” has been recently finalized. It aimed to improve knowledge of the potential role of different urban vegetation types for mitigating the O₃

and PM pollution levels. In this case however, the focus was only on the interactions between urban forests and the above mentioned air pollutants and implications for human health, therefore only covering one aspect of the proposed Action.

A number of LIFE+ projects are focusing on the urban area but few are focusing on the role of GI and UF. GAIA - Green Areas Inner-city Agreement aims to tackle two environmental problems through an integrated policy: climate change (both mitigation and adaptation effects of urban forestation) and air quality (the depuration potential of plants). EMoNFUr - Establishing a monitoring network to assess lowland forest and urban plantations in Lombardy and urban forests in Slovenia – will provide parameters of ecological and environmental relevance, such as plant and animal biodiversity in lowland forests, carbon dioxide sequestration capacity and the ability to mitigate air temperatures. The COST Action will be strictly cooperating with these projects in order to provide useful information which will be elaborated on and disseminated through the Action. Recently (2011), a Workshop on Urban and Peri-Urban Forestry, organized within the context of implementing the EU Forest Action Plan, focused on a wider and more complex agenda regarding the societal benefits provided by trees and green spaces.

The main message of the workshop was that GI enhances the quality of the places where people live, and their quality of life. The recommendations which resulted from this workshop included the need to pursue the objectives proposed in this Action, namely to better investigate and quantify the ecosystem services provided by UF and GI, and to gain a better understanding of how the provision of these services can be maximized.

C. OBJECTIVES AND BENEFITS

C.1 Aim

The aim of the Action is to increase the understanding on the role of UF in the context of GI in terms of ecosystem services provision. This ambitious goal will be achieved by bringing together a community of forest scientists with a multidisciplinary profile, ranging from ecology, ecophysiology, modeling, genetics, arboriculture, wood production, social sciences, landscape architecture, and urban planning, and who therefore have the capabilities to be able to study the relationships between UF and environmental and social ecosystem services. The list of deliverables which will be specified in D include: guidelines for planning and managing UF in order to maximize ecosystem services, including the tree species selection suitable to the different urban sites; measurements, data processing, storage and diffusion; testing and parameterizing present

models of tree and UF functioning; scientific papers; results of questionnaires; scientific summaries for policy makers; workshops; an interactive website. The final deliverables list will be prepared by the Management Committee.

C.2 Objectives

The specific objectives of the Action are :

- To collate recent (qualitative and quantitative) findings from national or international programmes about the ecosystem services provided by GI and UF.
- To compare different approaches and conditions (climatic, socio-cultural, economic and urban planning) in the countries involved, in order to develop best practice guidelines for GI managers and decision makers to assist in the maximization of benefits from GI and UF.
- To define environmental and social indicators and thresholds in order to improve the environmental quality of our cities, and consequently the quality of life of European citizens.
- To provide scientific evidence in order to implement those best practice into legislation both at local, national and European level
- To identify the main priorities and challenges in terms of future research on GI and UF

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

The means to achieve the objectives are:

1. Organizing workshops involving a range of stakeholders, including scientists, policy makers, managers and citizen associations
2. Organizing training school courses dedicated to the topics of the Action, specifically, two related to scientific aspects and one related to technical aspects.
3. Promoting trans-national access to researchers (particularly ESR) willing to visit another research institution and learn field/laboratory techniques/approaches
4. Launching the (US developed) concept of the Urban Field Station in Europe, as a location to create a tangible link between scientists, educators, managers and citizens.

By exploring and comparing the different approaches and conditions (in relation for instance to climate, to socio-cultural environment, to economy and to urban planning) at the local level within the countries involved in the Action, this project will be innovative in nature. The Action will

contribute to promoting the importance of the environmental and social benefits of GI and UF at the international level, and its trans-national nature will encourage a greater recognition of the role of GI and UF within regions, where often other competing priorities exist.

Another innovative point is that this COST Action will foster the shaping of a multidisciplinary community of scientists that will study the relationships between urban forests and environmental, economic and social benefits, and the implications for human health and well-being providing:

- an interface between scientists, policy-makers, managers and the public,
- linkages and communication between nationally funded research programmes relevant to the objectives of the Action.

C.4 Potential impact of the Action

The main benefits of this Action will be:

- a) To improve understanding of the role of UF and GI for improving the environmental quality in our cities, which will directly impact on human health and well-being, thus representing an important social advancement.
- b) Better economic evaluation of the ecosystem services provided by UF, as well as of the costs and benefits of the different practices used in both planning and managing UF;
- c) The dissemination of knowledge to managers, stakeholders, and national and regional governments will be crucial in order to develop the best practices to maximize benefit realization, and in order to provide input on how to include these issues in legislative regulations;

C.5 Target groups/end users

The list of target groups/end users who will be interested in this Action is quite long as it includes both scientific communities, local and national authorities, policy makers, professional forest and landscape managers, and private citizens.

Scientific communities who will be directly involved in the Action will be the European Forum on Urban Forestry (EFUF), the International Union of Forest Research Organisations (IUFRO), and the International Society of Arboriculture (ISA). Both members of EFUF and of IUFRO were actively

involved in the preparation of the proposal.

Moreover international organizations such as:

European Environment Agency (EEA), Food and Agriculture Organization of the United Nations (FAO), ICLEI – Local Government for sustainability, Metropolis, United Cities and Local Government (UCLG), United Nations Forum on Forests (UNFF), United Nations Environment Programme (UNEP), UN-Habitat, ICLEI – Local Government for sustainability, Convention on Biodiversity (CBD) of the United Nations, and World Health Organization (WHO) will be end users of this Action. FAO has actively participated in the proposal preparation.

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

The COST Action will be based on four tasks:

Task1 Environmental services of GI and UF and implications of climate change

Task2 Social/cultural services of GI and UF

Task3 Governance of UF in a GI approach

Task4 Integration and Dissemination to stakeholders

Given these four Tasks, the Action will focus on how scientific evidence relating to the environmental and social services provided by GI and UF can be used to influence the planning and management of urban forests in European cities, including exploring case studies where forestry has engaged with planning process. It will also investigate how environmental and social benefits can be realized in practice. This will involve exploring not only how they can be determined and quantified, but also the best ways to maximize the environmental and social benefits produced. This process is necessary to make people and policy-makers aware of how important trees and green spaces are in our cities. Unfortunately, at the moment many of the facts and figures that can strategically motivate policy and decision makers and which support arguments for raising the importance of GI and UF in cities are lacking.

During the course of the Action, the multidisciplinary approach adopted within the area of forestry will allow inclusion of novel aspects not foreseen in this Action plan. New feedback may come from science (e.g. understanding the role of UF in mitigating pollution and climate change by

adopting new measurement techniques), or from policy (e.g. new forms of governance).

D.2 Scientific work plan - methods and means

The Action will be based on 4 working groups (WG) following the 4 tasks described above:

WG1 Environmental services of GI and UF and implications of climate change

Within this WG, qualitative and quantitative data on the environmental ecosystem services (such as climate change mitigation, water control, phytoremediation, energy saving (including through the use of biomass produced within GI and UF)) provided by UF and GI will be collated, in order to provide a clear picture of the potential role of GI and UF in improving environmental quality. The activities of this WG will also focus on defining the threats represented by climate change on UF, and how management strategies and forest planning should take into account new climatic scenarios. The Action will promote an analysis of the efficiency of different practices adopted across Europe, focusing, for instance, on species used, management adopted and different environmental conditions, taking into account the economic point of view.

WG2 Social/cultural services of GI and UF

Within this WG, qualitative and quantitative data on the social or cultural services (such as aesthetic, spiritual, recreational and education services) provided by UF and GI will be collated, in order to provide a clear picture of the potential role of GI and UF in improving quality of life and place in urban areas, and, importantly, how these services can be quantifiably valued. This WG will also consider evidence on the social distribution of ecosystem service provision from GI and UF to better understand how a more equitable distribution of benefits can be achieved and maintained. It will also collate evidence (where it exists) on how best to design and maintain urban forests and GI for the maximization of social benefits.

WG3 Governance of UF in a GI approach

The activities within this WG concern the collation of information regarding the different approaches adopted across Europe in terms of the governance of GI and UF (including issues around tenure, planning, participation, conflict, and financing). This will include looking at existing

evidence and guidance on the barriers to achieving the full potential from UF and GI in terms of ecosystem services provision. Another of the main purposes will be to highlight case studies where the GI approach has been supported by the use of economic valuation techniques. An important aspect within this WG will be to collect information about legislation at local, national and European levels, in order to identify important gaps or adopt regulations at local level which have proven to be successful in a wider context.

WG4 Integrating and disseminating to stakeholders (Task-Force for dissemination)

This WG will start to operate as soon as appropriate information becomes available from the three previous WGs. In particular, the information gathered from the three WGS will be translated and adapted according to the needs of different end-users: scientific reports and a position paper for the scientific community; technical reports, including best practice guidelines for forest managers and private citizens; a roadmap for policy-makers, which includes clear inputs to be included in legislative outputs. Most of the information coming out of this WG will also be uploaded onto the Action's website.

The main deliverables will be the preparation and release, in agreement with all European institutions involved in this COST action, of:

1. A database collating all scientific evidence available on the above mentioned topics.

This will include scientific publications, reports, and models. Examples include datasets regarding the potential CO₂ and pollutant uptake of GI measured using micrometeorological techniques (e.g. eddy flux towers) in urban environments; datasets regarding the potential energy derived from the use of biomass from GI and UF in model cities; legislative regulations at local, national or European levels concerning the governance of GI and UF.

2. Guidelines for managers and private citizens which will advise on the best tree species and the best practices for the maximization of benefits from GI and UF

This will be carried out distinguishing three climatic zones in Europe: northern European countries, continental Europe, and Mediterranean countries. In this way, it will be possible to consider species suitability for different climatic conditions and to prioritize benefits according to the areas (e.g.

decreasing heat island effect for Mediterranean countries).

3. A scientific position paper to highlight research priorities and challenges regarding GI and UF

This will be necessary in order to draw attention to a number of topics where knowledge is still scarce, in order that future research efforts in the field can be influenced to address these gaps.

4. Implementation and diffusion of models for the estimation of the benefits derived from UF

Software/models developed in the US, such as UFORE, i-TREE and STRATUM are now being adapted and implemented in Europe. The status of adaptation and implementation of these tools in European cities will be analyzed, and their diffusion, both within the scientific community and within public administrations will be encouraged.

5. The results of questionnaires developed among all the countries involved in the Action

Since governance approaches towards GI and UF do not always consider or engage local people, it will be important to collect information regarding the perceptions and expectations of citizens in different parts of Europe about the ecosystem services provided by GI and UF.

6. A roadmap for policy makers in order to provide indicators, thresholds and tools to be included in legislation at local, national or European level regarding the governance of GI and UF

Collation of scientific evidence and preparation of guidelines will potentially have a significant impact on GI decision-makers who have responsibility for implementing tools to balance and integrate the different benefits provided by trees and green spaces into their planning, and who are able to mobilize and allocate resources for GI implementation.

7. An interactive website

Besides providing the usual information regarding the purpose etc. of the Action, the Action's website will include the facility to consult different databases, and will include a useful tool for managers and private citizens to help with the selection of species, according to climatic zone and the primary desired benefit or benefits: each species will receive a score for each of the listed ecosystem services and the user will have to prioritize the required benefits. Moreover the website it will allow people to complete questionnaires for use by the WGs. The website will also include interview transcripts, where scientists explain the importance of GI and UF in an easily understandable format so that they will appeal to a broad audience. The Management Committee will evaluate the suitability of posting these interviews on social networks such as Facebook or YouTube to increase dissemination potential, and to translate scientific knowledge for consumption by the general public.

E. ORGANISATION

E.1 Coordination and organisation

The Management Committee (MC) with members nominated by the FPS domain will coordinate the Action. A Steering Committee (SC) (including the Chair and Vice Chair of the Action, the Chair of each of the four WGs and the person leading the Short Term Scientific Mission (STSM) panel) will support the MC and will monitor the activities carried out throughout the Action.

A large part of the budget will be invested in STSMs as it is one of the main goals of the Action to motivate young people to engage with the issues raised, and develop scientific research related to the topics of the Action. For this reason, a panel will be formed, made up of three delegates nominated from the members of the MC, for the evaluation of applications for STSMs. As the website will be an important instrument of this COST Action, where interactive tools will be made available, responsibility for it will be assigned to a MC member.

It is expected that this COST Action will organize three Training Schools. Two of these will be related to scientific aspects, and therefore focused at PhD students and early stage researchers. The other Training School will be related to technical and management aspects, thus mainly involving GI and UF managers and planners. Responsibility for these Training Schools will be assigned to one or more MC members.

Each year, an important task will be to promote an international workshop (hosted by partners in the Action) to bring together a wide community of research scientists within the area of forestry, but whose expertise is drawn from a variety of disciplines, including plant ecophysiology, arboriculture, modeling, urban planning, governance, and the social sciences. These workshops will concentrate on discussion around the most appropriate approaches to planning and managing GI and UF in order to maximize the benefits to the population. During each annual workshop, the MC will meet separately to discuss the most feasible methods to create technical reports and make them available to stakeholders, and to collectively work on the preparation of scientific reports.

The MC will agree upon specific tools and actions that each MC member should take forward to engage with the various end-users of the Action, and to guarantee the transfer of knowledge at national level. This will be achieved, for instance, through regular workshops in conjunction with ongoing COST activities, but also through specific initiatives according to the national calendars of relevant events (such as the Day of the Tree in Italy on 21st November).

Milestones of the Action are:

- 1) The kick-off meeting at the beginning of the Action, which will involve agreeing on the constituency of the MC and SC, the Election of the Chair, Vice-Chair and WG Chairs
- 2) The annual workshops, which will include both a meeting of the Management Committee and of the Steering Committee for an accurate evaluation of the activities carried out by the different WGs
- 3) The WG meetings, which will occur both in conjunction with the MC meetings and also through audio-conferences, particularly among smaller subgroups to develop specific initiatives
- 4) The interactive Web-site, which will be semi-operative from month 3, and which will be enriched with tools and questionnaires throughout the Action to facilitate the bottom-up approach
- 5) Training Schools; it is anticipated that three Training Schools will be organized within this Action
- 6) Final conference, where the results of the Action will be disseminated and new initiatives emerging from this Action will be launched.
- 7) Handbook of the STSMs, including the reports by the STSMs funded by the Action
- 8) A Book, including all the main achievements by the different WGs
- 9) Guidelines to optimize ecosystem service delivery from GI and UF
- 10) A Roadmap for policy makers to provide input for regulations at local, national or international level

E.2 Working Groups

The Cost Action will be organized into the following working groups (WG)

WG1 Environmental services of GI and UF and implications of climate change

WG2 Social/cultural services of GI and UF

WG3 Governance of UF in a GI approach

WG4 Integration and Dissemination to stakeholders (Task-Force for dissemination)

For each WG a Chair and a Vice Chair will be nominated during the kick-off meeting. For each WG a number of subtasks will be agreed in order to better ensure the implementation of the work plan and to achieve the objectives of the Action.

E.3 Liaison and interaction with other research programmes

This COST Action will benefit from previous and current activities carried out at the European level and from the information gathered from previous programmes on related topics. For example, the COST Action E12 “Urban Forest and trees” ended in 2002 and the COST Action E39 “Forests, Trees and Human Health and Wellbeing”, ended at the end of 2008. While the first one was important to launch the concept of urban forest, the second one was crucial to launch the link between forests and quality of life.

This COST Action will be strictly interacting with at least three current COST Actions: FP0903 because of the link with climate change and the adaptation/mitigation of the trees, FP1001 regarding the topic of supply of wood resources also in urban environment and the TD1106 about the topics of urbanization and the utilization of green spaces.

Common workshops will be organized on the correlated topics: in particular for the FP0903 which is expected to finish just after to the potential start of this Action, it is planned to organize a session on the interaction of climate change and air pollutants with urban forest at the final conference.

This COST Action will actively co-operate with IUFRO Task Force on Forests and Human health, which was established (in 2007) to bring a global perspective in the importance of forests as a source of stress relief, aesthetic appreciation and recreation for the urbanized population.

It is clear that in each country, existing national and regional research programmes are being funded in order to better understand the role of UF for improving life quality in urban areas. At the same time, local administrations are investing in planting programs without considering emerging

findings from research which would improve ecosystem services provision. Furthermore, some LIFE+ projects are dealing with these topics and using one or more cities as case studies such as GAIA and EMoNFUr mentioned above.

This COST Action would be an excellent way in which to coordinate and integrate this impressive amount of past and current work in order to track the future challenges for European scientists in this field and improve life quality in European cities.

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 MC 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.

In order to guarantee the gender balance, two of the WGs will be led by women and two by men. It will also be a priority to ensure that women are involved in the MC, the STSMs, and the workshops and training schools. It is established as a rule that for each WG the Chair or the Vice Chair should be a woman.

As described above, a significant part of the budget of the Action will be reserved for early stage researchers (ESR) through funding STSMs and Training Schools, where ESR will have a priority. Moreover the direct involvement of ESR in the MC will be considered critical. It is established as a rule that for each WG the Chair or the Vice Chair should be an ESR.

F. TIMETABLE

The Action will last for four years and the timetable of main activities are reported in the chart below:

Year	I				II				III				IV			
<i>Trimester</i>	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Meetings	Mc		Sc		Mc		Sc		Mc		Sc		Mc		Sc	
Workshops				x				x				x		x		
Conferences																x

STSM			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Training schools							x				x				x	
Web-site		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Book writing									x	x	x	x	x	x		
Guidelines preparation					x	x	x	x	x	x	x	x	x	x	x	x
Publications					x	x	x	x	x	x	x	x	x	x	x	x
WG 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
WG 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
WG 3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
WG 4 (TF)			x	x	x	x	x	x	x	x	x	x	x	x	x	x

MC: Management Committee; SC: Steering Committee; WG: Working Group; TF: Task-Force

MC meetings will occur typically at the beginning of each year while the SC meetings usually during the third trimester of each year.

One main conference will be organized by the end of the Action with the primary purpose of transferring knowledge and launching new initiatives emerging from the Action. The reason for organizing only one conference is because the cost is typically very high and the Action is keen to ensure sufficient budget resources are reserved for ESR to participate in STSMs (two calls will be launched every year) and Training Schools (three will be organized – one each in the second, third and fourth years).

The web-site will be operative starting from the second trimester of the first year and will be enriched with interactive tools throughout the Action.

During the whole of the third, and the first half of the fourth year, the scientific book, including the main topics of the Action, will be written so that it will be ready for launch at the Final Conference.

The activities for the realization of the Guidelines (which will be more technically focused than the book) will start in the second year and will go until the end of the Action.

Other publications will be realized, starting from the second year. These will include an opinion paper and a roadmap for policy makers.

Finally, the activities of the different WGs will start immediately after the first MC, except for WG4, which will begin its activities as soon as information is gathered and made available from WGs1, 2 and 3 (approximately in the third trimester of the first year of the Action).

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: AT, BE, BG, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IL, IT, MT, NL, NO, PL, SE, SI, 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 88 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 target audiences for the dissemination of the results of the Action are:

- Scientific Communities: it is evident that the MC of the Action will largely be constituted of scientists, and that some of the outputs (such as the scientific book and the opinion paper on challenges) will mainly be circulated within different scientific communities. Most of the STSMs will be carried out within universities or research centers and two of the three planned Training Schools will be mainly organized for PhD students and ESRs.
- GI and UF planners and managers: an important target audience for dissemination of best practice for optimizing the ecosystem services provided by GI and UF will be private companies and technicians or officers of public administrations. These will also be the main target audience for the Guidelines which will be developed throughout the Action. GI and UF planners and managers will also be invited to attend some of the workshops and one of the Training Schools will be organized with a primary focus on technical aspects of interest to this audience.

- International, national and local authorities: as explained above, the Action will provide a more thorough qualitative and quantitative understanding of the ecosystem services provided by GI and UF for this audience. The dissemination of environmental and social indicators, thresholds, etc., will be important in terms of securing political measures to support appropriate GI and UF planning and management.
- Private citizens: it is clear that most GI and UF in and around our cities belongs to private citizens. The general public are also clearly the beneficiaries of ecosystem services from GI and UF. As such, it is clear that the planning and management of GI and UF should not exclude the participation of private citizens and that a bottom up approach is highly desirable. Thus some of the activities of the Action will directly involve or provide services to the general public, such as the interactive website with questionnaires and tools.

H.2 What?

The dissemination of the Action will be carried out through:

- 1) An interactive website which, alongside providing information and hosting the main outputs of the Action, will include questionnaires and tools such as those described above for use by all the target audiences.
- 2) Workshops enabling dialogue between various scientific communities and the other target audiences
- 3) A large Final Conference which will disseminate all the main findings and achievements of the Action to all the target audiences
- 4) A scientific book which will mainly be disseminated to the scientific community, including a summary of the state of the art of research in the field
- 5) An opinion paper which will be mainly disseminated to the scientific community, focusing on priorities and challenges in future research in the field of GI and UF
- 6) Guidelines which will be mainly disseminated to planners and managers
- 7) A roadmap, mainly for policy makers in order to provide them with a set of indicators which could be included in legislative regulations
- 8) Three Training Schools – two focusing on scientific aspects and one on technical aspects.

H.3 How?

WG 4 will specifically develop a detailed dissemination plan and will adapt it throughout the Action to meet identified needs and priorities. Some specific measures, such as total visits to the website, number of applications to the STSM calls and Training Schools, and number of requests from people outside the MC to join the WGs, will give an indication of dissemination efficiency and will suggest actions to be undertaken to improve it throughout the Action.

All the activities of the Action, such as announcements for Workshops, the Conference, STSMs, and Training Schools, will be advertised through the web-site. Moreover, mailing lists provided by partners (most of them are involved in other European and national projects/networks/associations), will be used to further disseminate information to a wider range of end-users.

Materials and/or minutes from the Workshops, Conference and Training Schools will be made available through the web-site.