SEVENTH FRAMEWORK PROGRAMME

Marie Curie Actions

People

International Research Staff Exchange Scheme

Annex I - "Description of Work"

DESCRIPTION OF WORK

PART A

1. *Grant agreement* details

Full Title: Fluvial processes and sediment dynamics of slope channel systems: Impacts of socio economic-and climate change on river system characteristics and related services

Acronym: FLUMEN

Proposal Number: 318969

Scientific Panel: ENV

Grant Agreement Number: PIRSES-GA-2012-318969

Duration of the project: 48 months

Project start date: 01.12.2012

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2. List of participants (*beneficiaries* and *partner* /*organisations)*

Partner Number	Partner name	Partner short name	Country
1 *Beneficiary* 1	UNIVERSITA DEGLI STUDI DI FIRENZE	UNIFI	Italy
2 *Beneficiary* 2	UNIVERSITA DEGLI STUDI DI PALERMO	UNIPA	Italy
3 *Beneficiary* 3	EBERHARD KARLS UNIVERSITAET TUEBINGEN	EKUT	Germany
4 Beneficiary 4	UNIWERSYTET KAZIMIERZA WIELKIEGO	UKW	Poland
5 Beneficiary 5	STOCKHOLMS UNIVERSITET	SU	Sweden
6 Beneficiary 6	UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IASI	UAIC	Romania
7 Beneficiery 7	INSTITUTUL DE ECOLOGIE SI GEOGRAFIE	IEG	Moldova
7 Partner 1	STATE EDUCATION AND SCIENTIFIC INSTITUTION FACULTY OF GEOGRAPHY OF M.V. LOMONOSOV MOSCOW STATE UNIVERSITY	MSU	Russia
8 Partner 2	TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV	TSNUK	Ukraine
9 Partner 3	FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF HIGHER PROFESSIONAL LEARNING KAZAN VOLGA REGION FEDERAL UNIVERITY	KSU	Russia
10 Partner 4	IVAN FRANKO NATIONAL UNIVERSITY OF LVIV	IFNUL	Ukraine

3. Project summary

The project is focused on the ecological and morphological characteristics of river channels and related processes of erosion, sediment transport and deposition under changing boundary conditions described by socio economic and climate change scenarios. We will study effects of these changes on river systems at different spatial and temporal scales. The specific focus of the project is addressing the interface between the river channel and related slope systems. We will study historic evolution of river systems and will simulate future developments using scenarios.
The main projects scopes are:
1) Exchange of experience, methods and knowledge in fluvio-morphologic processes research.
2) Developing and harmonization of tools and models for monitoring and management of hillslope-river channel-systems.
3) Assessment of hydromorphological processes, and pressures across multiple temporal and spatial scales in different European river systems;
We will examine the links between erosive processes and hydromorphology in the context of integrated river basin management, considering the interactions with other elements of the whole system such as anthropogenic pressures and environmental changes. The new tools will help to assess the processes dynamics at the interface between hydrogeomorphological river processes and slope systems in a qualitative way. Moreover, new innovative techniques will be developed and applied that allow a quantification of the processes. The special focus is on remote sensing, aerial photography, field measurements with total stations, GPS, statistical analysis, all integrated in a GIS.
We will reach these targets as a multidisciplinary team across Europe, sharing knowledge, developing new approaches and applying them in different environments. We will explicitly aim to identify and integrate the different and overlapping conceptual understandings of scientists from the different disciplines carrying out joined research in this project.

PART B

4. Quality of the Exchange Programme

4.1 Objectives and relevance of the joint exchange programme

4.2. Work Packages

Table 1: List of Work Packages

Work package n°	Work package title	*Beneficiary*/partner organisation short name	Start month	End month
1	General overview and state-of – the-art in erosion and fluvial processes research	UNIPA, UAIC / IEG, KSU, TSNUK	2	48
2	Links between fluvial processes, erosion, human impact and climate changes	UKW, IEG / IFNUL, MSU	2	48
3	Development of complex study methodology	EKUT, SU / IFNUL, MSU	.2	48
4	Diverse studies of rivers environment	Unifi, UKW / MSU, KSU	2	44
5	Series of model experiments	Unifi, EKUT, SU / MSU, TSNUK	2	48
6	Communication,dissemination, networking, coordination and management	Unifi / MSU	1	48

Work package number	1	Start date or starting event:	Month 2
Work package title	Study on selected rivers, collecting data		
Beneficiary/Participant Organisation short name	UNIPA, UAIC / IEG, KSU, TSNUK		

Objectives

The main objectives of this work package are the following:
1. Gathering all the existing data about rivers of interest;
2. Identification of research deficits according to the project focus;
3. Outlining the parameters that are exposed to alteration (divided into natural factors and human impacts); assigning criteria necessary for fluvial and erosion processes in relation to climate change and human impact (ecological, hydromorphological and hydrodynamic models considering human impact and climate change).

Description of work

The aim of WP1 is the collection and analysis of the existing data on rivers of interest with the intention of further detailed assessment and study in the next sections such as exposure of interconnections between river system parts, design of complex research methodology and processes modeling in river systems. Special attention will be paid to concrete cases characterized by various climatic, morphological, hydrological and ecological conditions. It will help to describe the major problems on European rivers. The joined study of various national and international river systems allows to elaborate a unified terminology of the existing problems and to work out mutual approach to its interpretation.

Task 1.1: Collection of basic data and generation of missing indispensable data

In the first part of the project we will focus on hydrological, erosion and ecological data on different spatio-temporal scales for the analysis of the different river catchments. Special attention is paid to boundary conditions. Water regime parameters and catchment characteristics are studied in their interaction and dynamics. This approach allows revealing the anthropogenic impact as well as the behaviour of selected river systems under various climate changes scenarios.

Task 1.2: Analysis of ecological conditions

Ecosystems and their properties are a significant part of our research. Just living organisms react to environmental changes most sensitively. We will estimate the ecological conditions of river basins and will define key-indicators which are a proxy for environmental changes. Data on biological characteristics and information about environment (chemical composition of water and sediment, physical specifications for water bodies and channel and catchment natural and anthropogenic processes) is planning to be applied in system reaction models. The models will allow us to forecast

Deliverables

D1.1 - Report on collected data on various spatio-temporal levels of river systems and its application in other work packages

D1.2 - All collected data are integrated in GIS

Staff secondments and transfer of knowledge

ER1 will move from UNIPA to KSU on month 10 for 2 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ESR1 will move from UNIPA to TSNUK on month 20 for 1 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ESR2 will move from UNIPA to IFNUL on month 20 for 3 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ER1 will move from UAIC to KSU on month 18 for 3 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ESR1 will move from UAIC to TSNUK on month 22 for 2 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ER1 will move from IEG to IFNUL on month 25 for 2 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ER1 will move from KSU to UNIFI on month 8 for 2 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)
ER1 will move from TSNUK to SU on month 18 for 1 month duration in oder to perform Task 1.1. and 1.2 (transfer of knowledge)

Risk management

Risk: data might not be available or only at high prices.

Mitigation: Selection of alternartive River Systems where we have easy access to data and where we have no additional costs

Work package number	**2**	**Start date or starting event:**	Month 2
Work package title	Links between fluvial processes, erosion, human impact and climate changes		
***Beneficiary*/Participant Organisation short name**	UKW, IEG / IFNUL, MSU		

Objectives

The main aim of this workpackage is to reveal interactions between key processes – fluvial and erosion processes and its influence on river ecosystems with a glance of human impact in climate change conditions. Hydromorphological processes in river basin are definitive factors in ecosystems formed there. These factors and processes are complexly interlinked, some of them react to anthropogenic impact, others respond to natural changes. In this WP we'll sort out specific and mostly sensitive elements of river systems and typical interactions.

Description of work

Processes will be studied in two-ways looking at their: i) influences and ii) interactions. Spatial attention will be given to river systems sensitivities, to anthropogenic impact and climate changes. The procedure allows us to work out more effective monitoring and management measures for river systems and to find out how changes of one characteristic factor influence on the other factors. We also take into account the i) diversity in the management of large rivers in Europe (managed differently in Western, Middle and Eastern Europe), ii) size of the rivers and iii) economical factors of the countries, through which they flow. These factors directly influence on the channel processes. For instance, differences between poorly managed Vistula and well managed Rhine catchment. Structures such as reservoirs cause irreversible disturbance in the dynamics of the sediment transport down the river. The project includes this problem, since it has been extensively studied in Ukraine and Poland.

Task 2.1: Identification of interaction levels in river systems

Processes of interest in river systems interact in various spatial and temporal scales. First we sort out the most sensitive elements of river systems which react to external changes more intensively; subsequently we determine the level (river network, river basin, tributary etc.) of influence. In this work task we will supply information to the following work packages.

Task 2.2: System Analysis by environmental and socio economic factor correlations

In this WT we focus on the correlation and settings of various environmental and socio-economic parameters of river systems. The assessment of parameter correlations, of characterized river system properties and processes, is one of the main objects of modern Geographical Science. Detecting these correlations we can analyse the reaction of one group of system elements and the corresponding changes of the others. Herewith observation system and estimation of individual parameters are simplified considerably. For example the procedure of optical turbidity detection is less time and labour-intensive than detection of weight turbidity. But in practice we use weight turbidity for carrying out calculations as usual. Turbidity detection is simplified manifold if we make correlation between weight and optical turbidity. Selecting individual indicators of ecosystem conditions we can determine reaction of one element group corresponding to the variability of others by application of correlations. Making correlations is a subst antial step to assess poor-studied territories. Using input data which we get by indirect methods allows in some cases the estimation of characteristics which are not observed at stations. Correlations made for specific rivers could be utilized to characterize adjacent river basins situated in similar landscape conditions or under the same type of anthropogenic impact.

Deliverables

D2.1 - Report on correlation models with a glance of environment changes

D2.2 - Joint presentation on WP results at EGU 2014

Staff secondments and transfer of knowledge

ER1 will move from UKW to IFNUL on month 10 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

ESR1 will move from UKW to MSU on month 32 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

ESR1 will move from IEG to TSNUK on month 38 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

ER1 will move from AICU to KSU on month 10 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

ESR1 will move from MSUto UNIFI on month 14 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

ESR1 will move from MSU to UNIFI on month 14 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)
ER1 will move from MSU to UNIFI on month 13 for 1 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)
ER1 will move from IFNUL to UNIPA on month 1 for 2 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)
ER1 will move from IFNUL to UKW on month 10 for 1 month duration in oder to perform Task 2.1. and 2.2 (transfer of knowledge)

Risk management

No risk management has be taken into account for this work package

Work package number	**3**	**Start date or starting event:**	Month 2
Work package title	Development of an interdisciplinary and integrativemethodology		
***Beneficiary*/Participant Organisation short name**	EKUT, SU /IFNUL, MSU		

Objectives

The main objective of this work package is the development of a complex integrative study methodology for the test rivers basins. The main point of this project task is the development of a universal observation system which could be applied in various natural conditions. Complex programmes will be worked out on the basis of WP1 and WP2 and will focus on the most urgent problems of the study areas and collecting additional data on scarcely studied territories (based on WP1). The universality of the methods and the equipment make it possible to compare the characteristics of river systems in changing natural conditions.

Description of work

The work is closely related to the generalization of data collected in WP1 and WP2. It relies on information about the most daunting problems which needs more detailed data such as: complex observations on water regime characteristics, erosion and ecological factors. A specific task of the WP is the observation of anthropogenic impact types and their degree. Special attention is paid to the methodology of observations in non-gauged basins (for example rivers of volcanic territories) where it's necessary to carry out series of short duration but effective observations which allow to make conclusions about fluvial processes, erosion and ecology.

Task 3.1: Choice of key areas and range of observation characteristics

The WT is aimed at the selection and characterization of key areas in order to get relevant environmental information. For several objects (where it's necessary) we will work out methods to determine river characteristics based on indirect measurements. We will work out observation programmes on non-gauged basins. Important aspect of the work is the application of remote sensing to determine flow characteristics and to develop indicators for the monitoring of changes. This method will enable us to deal with regions that are difficult to access or where information is lacking for spatio-temporal generalizations.

Task 3.2. State-of-the-art in non-gauging rivers research

State-of-the-art research methods in non-gauging catchments are mainly based on remote sensing application. Satellite photographs with high resolution allows to asses many basin parameters such as forest-coverage, vegetation type, soil type, relief ruggedness, lake-coverage, etc. which are highly relevant for the quantitative assessment. These parameters are used to describe processes in river basins. Analysis of satellite photographs spectral radiance has a special significance: At present this method is widely applied to determine non-gauging rivers' turbidity. An crucial advantage of RS assessments are their applicability on spatial large-scale in order to generate maps of different parameters for the chosen river basins. Moreover, these parameters are actively applied in modeling and scenario simulations.

Deliverables

D3.1 - Report on universal system of observations on European rivers
D3.2 - Report on methods of flow characteristic assessment by indirect measures
D3.3 - Joint presentation on WP results at the Interuniversity council for soil erosion and fluvial processes (MSU)
D3.4 - Joint scientific paper

Staff secondments and transfer of knowledge

ER1 will move from EKUT to MSU on month 22 for 2 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER1 will move from EKUT to IFNUL on month 15 for 2 month duration in oder to perform Task 3.1. and 1.2 (transfer of knowledge)
ESR1 will move from EKUT to MSU on month 22 for 2 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER1 will move from SU to MSU on month 27 for 2 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER2 will move from SU to MSU on month 27 for 2 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER1 will move from IFNUL to UKW on month 16 for 2 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER2 will move from IFNUL to SU on month 19 for 1 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER2 will move from MSU to EKUT on month 29 for 1 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ESR2 will move from MSU to UKW on month 2 for 3 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER3 will move from MSU to UKW on month 2 for 3 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)
ER1 will move from MSU to EKUT on month 35 for 6 month duration in oder to perform Task 3.1. and 3.2 (transfer of knowledge)

Risk management

No risk management has be taken into account for this work package

Work package number	4	Start date or starting event:	Month 2
Work package title	River environment assessment		
Beneficiary/Participant Organisation short name	UNIFI, UNIPA, UKW / MSU, KSU		

Objectives

The main object of WP4 results from WP3: to carry out observations on rivers according to the scheme worked out in WP3. Significant aspect of this package is designing a WebGIS Databaseproject containing all the information collected and the data generated in this project. The GIS project will enclose cartographic data, remote sensing data, hydrological time series and field expedition data. The DB is utilized to extract the relevant input for the models and simulation runs as well as to store the related model output in order to get quantitative measurements of these changes.

Description of work

WP4 consists of two key areas - field observation and designing of the WebGIS-Database project. The main source of field observation data are provided by fieldwork and expeditions. A Database will be developed and implemented to guarantee a wide exchange of data and a up to date status of all data for the project participants. A GIS-project will be based on information collected in WP1 and new data get in the DB and GIS.

Task 4.1: Case studies' classification

We study European rivers in various natural conditions. By subject these rivers are divided into 4 main categories:

1. Plain rivers.

This group include rivers in natural and anthropogenic conditions - the Oka and the Northern Dvina rivers (Russia), the Dniester river and the Prut river (Moldova, Ukraine) the Dnieper river (Ukraine), the Vistula river (Poland).

2. Small plain rivers.

These rivers make it possible to carry out experiments and to study many phenomena on limited areas. As an example we will work on the well-studied Protva river (Russia) Arno River (Italy).

3. Mountain rivers.

This group of rivers will be studied in the Caucasus and Kamchatka region (Russia) & In the Appenine (Italy).

4. Special type of mountain rivers – rivers of volcanic territories.

This river group is specific in terms of its particular features in hydrological regime, sediment yield, ecosystems and absence of human impact in many cases. The examples of these rivers could be found in Kamchatka (Russia), Sicily (Italy), Mugello (Italy).

Task 4.2: Collection of field observation data

This work package contains observations on discharge and erosion characteristics and their connection with ecological conditions in order to specify of the study areas. New data enable us to carry out accurate correlations before and to find out new natural relations of factors interconnections.

Task 4.3: Design of WebGIS-Database project

The webGIS-DB project design is planned in three levels:

1. basin level (for the river basins under research straightly);

2. regional level (basin level is added into environment and studied in relation with it);
3. international level (united project including the whole territory under the study).

Deliverables

D4.1 - Joint presentation on WP results at EGU 2015

D4.2- Web-GIS database

Staff secondments and transfer of knowledge

ER1 will move from UNIFI to MSU on month 6 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER2 will move from UNIFI to MSU on month 18 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER3 will move from UNIFI to KSU on month 24 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER1 will move from UKW to IFNUL on month 10 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ESR2 will move from UKW to MSU on month 32 for 3 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ESR2 will move from MSU to SUMSU on month 32 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ESR4 will move from MSU to SU on month 32 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER1 will move from MSU to SU on month 4 for 1 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER1 will move from KSU to UNIPA on month 4 for 4 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)
ER1 will move from UNPA to MSU on month 6 for 2 month duration in oder to perform Task 4.1. and 4.2 (transfer of knowledge)

Risk management

No risk management has be taken into account for this work package

Work package number	**5**	**Start date or starting event:**	Month 2.
Work package title	Model experiments		
***Beneficiary*/Participant Organisation short name**	UNIFI, EKUT, SU / MSU, TSNUK		

Objectives

The main objectives of WP5 are the following:
1. Application of existing models and working out new models, considering hydrological, morphological, dynamical and ecological parameters; selection of the most characteristic parameters which are the most well-studied and allowed to reproduce the best results of modeling (closely related with the present conditions);
2. Carrying out thematic estimations based on various climate change scenarios;
3. Comparison of results derived by various models for different conditions; analysis of derived results in order to get: 1) the newest and the most interesting modeling results; and 2) the results which are the closest to present natural conditions; and the assessment of utilized parameters (its reliability, model sensitivity).

Description of work

Task 5.1 Models application and development

The main task is the identification and collection of the most widely used models in each partnerorganization. The next step is its adaptation for all rivers under research. This approach will allow us to compare model results for various river systems and to reveal model describing systems in the most effective way. The key-issue is to work out a integrative model considering various characteristics of river systems or to identify benchmark models for specific catchment types or river segment conditions. The models will cover various aspects such as fluvial processes, erosion, ecological conditions as well as climate change and socio-economic change scenarios.

Task 5.2 Parameter management

Parameter selection is often the most difficult stage in modeling. We have to select a limited number of parameters and to find out new proxies that describe for example socio-economic changes and their impact on river systems. Reliability evaluation and adequacy of its estimation is a very important step. Methods to estimate parameters should be simple and based on elementary calculations in order to avoid additional errors in computations. In these cases where it's possible (well studied river systems) unknown parameters will be determined by selection.

Task 5.3 Carrying out modeling

Post amble of WP5 is carrying out calculations based on selected and worked out models with emphasis on the chose parameters and the defined boundary conditions. At this stage computation will be carried out with a focus on climate changes scenarios. Errors will be revealed and corrected. The results will be assessed and will allow determining the most adequate model working in the best way in corresponding conditions. We'll choose models for lowland rivers, small lowland rivers, mountain rivers and volcanic rivers separately. Varying parameters we hope to get a range of new and interesting results.

Deliverables

D5.1 - Report on results of modelling

D5.2 - Joint scientific paper

D5.3 - Joint Presentation at the Interuniversity council for soil erosion and fluvial processes (MSU)

Staff secondments and transfer of knowledge

ER1 will move from UNIFI to TSNUK on month 30 for 2 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)
ER2 will move from UNIFI to IFNUL on month 42 for 2 month duration in oder to perform Task 5.1.,

5.2 and 5.3 (transfer of knowledge)
ER2 will move from EKUT to IFNUL on month 15 for 2 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)
ESR1 will move from SU to MSU on month 30 for 2 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)
ESR1 will move from SU to TSNUK on month 30 for 2 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)
ER4 will move from MSU to SU on month 41 for 3 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)
ESR1 will move from TSNUK to UNIPA on month 25 for 2 month duration in oder to perform Task 5.1., 5.2 and 5.3 (transfer of knowledge)

Risk management

No risk management has be taken into account for this work package

Work package number	**6**	**Start date or starting event:**	Month 1
Work package title	Communication, dissemination, coordination and management		
***Beneficiary*/Participant Organisation short name**	UNIFI / MSU		

Objectives

The main objectives of WP6 are:
- Establishment, intensification and maintenance of partner communication;
- Dissemination of project results and developed procedures and models in the scientific community;
- Attracting attention of interested stakeholders such as other research teams and partners from the private, economic, agricultural or governmental sector;
- Effective dissemination of project progress and results
- Providing the scientific and administrative reports to the European Commission required by the contract.

Description of work

The different activities of WP6 are aimed at the establishment and maintenance of intensive communication between the Partners, wide dissemination of project results and introduction of project results to stakeholders on various levels as well as incorporating stakeholder feedback into the project activities. Main subtasks are:

1) Website and database development;
2) Mobilization of media sources (electronic delivery, social networks, blogs, radio, TV, printed matter such as brochures, posters, etc.);
3) Presentation project results by Participants on thematic conferences and workshops.

A communication and dissemination plan will be developed at the start of the project. It will provide a more formal structure and justification of the various activities by identifying target audiences, methods and media for actions, along with an assessment of their cost effectiveness. The output from this plan will be a programme of activities to ensure maximum effect within the project.

Task 6.1. Project Website and database
Project website and database is required for the following functions:
1. Effective communication of Partner-organizations;
2. Carrying out effective management and inspection of project implementation;
3. Spreading project results.
2. Carrying out effective management and inspection of project implementation;
3. Spreading project results.
Participants, reports, event programmes, detailed project plan and dates of implementation and another necessary information will be placed on site. Stakeholders will receive information on their area of interest and communicate with members of other areas here. The Website will allow us to assess the interest in project and the impact of derived results. The database will provide a facility to store, manage and exchange all relevant project data.

Task 6.2. Communication and dissemination
A detailed plan of communication and dissemination will be worked out at the very beginning of the project with the participation of all Partners. This plan could be changed on-stream in dependency on concrete conditions and appearance of new ideas and directions in work.
Dissemination of project results contains:
1) Printed materials distributed among stakeholders;
2) Serial electronic publications;
3) Participation in conferences with project results;
4) Application of project results in training courses.
On the early stages of the project we are going to contact external experts to join the Advisory Committee in order to provide intellectual property rights and conflict resolutions in multinational and multi-cultural team of scientists.

Task 6.3. Coordination and management
The coordinating institution will establish a project secretariat to administer the project, communicate with partners and ensure timely preparation of progress and annual reports. The project co-ordination team will comprise the Coordinator, a deputy Coordinator and a nominated project administrator.
The project coordination will include regular monitoring of the progress of the project components to identify and resolve any issues, which might adversely affect the outcome of the project. The control of the project implementation will be carried out by reporting on Website. The Coordinator will prepare reports as often as it will be agreed. The Coordinator will also lead the researchers exchange programme.

Task 6.1. Project Website and database

Project website and database is required for the following functions:

Deliverables

D6.1 - Presentation of the project document templates and base website at the Interuniversities Council and in media
D6.2 - Communication and Dissemination plan
D6.3 - Final project website as portal to project results
D6.4 - Final report on project science and implementation
D6.5 - Joint scientific paper

Staff secondments and transfer of knowledge

ER1 will move from UNIFI to KSU on month 44 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ER1 will move from TSNUK to UAIC on month 27 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR1 will move from EKUT to IFNUL on month 15 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR2 will move from EKUT to MSU on month 6 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR1 will move from UNIFI to MSU on month 6 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR2 will move from UNIFI to MSU on month 24 for 2 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ER2 will move from IFNUL to SU on month 19 for 1 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ER2 will move from IEG to KSU on month 33 for 1 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR2 will move from UAIC to MSU on month 18 for 3 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)
ESR2 will move from UAIC to KSU on month 15 for 1 month duration in oder to perform Task 6.1. to 6.5 (transfer of knowledge)

Risk management

No risk management has be taken into account for this work package

Table 2: List of Milestones

List and schedule of milestones					
Milestone n°.	**Milestone name**	**WPs n°'.**	**Lead *Beneficiary*/ organisation short name**	**Delivery date**	***Comments***
1	Initial data avaliability	1	UNIPA, UAIC, IEG, KSU	6	Report
2	Identification of interaction in natural processes	2	UKW, IEG, IFNUL, MSU	26	Report
3	Observing system for rivers under research	3	EKUT, SU, IFNUL, MSU	22	Report
4	Studies results identification	4	UNIFI, UKW, MSU, KSU	44	Report
5	Report on models	5	UNIFI, EKUT, SU, MSU, TSNUK	30	Report
6	Base website	6	UNIFI, EKUT, MSU, TSNUK	8	Website
7	Project financialand Administ rative reporting	6	UNIFI, MSU	47	Report

Table 4: Gantt chart of secondments (*Table A.3.4 from the GPF*)

The Gantt chart shall illustrate the secondments of exchanged staff towards all the participant organisations for the whole duration of the *project*.

Project Number [1]	318969	Project Acronym [2]	FLUMEN

One Form per Project

Participant number	From participant	From country	To participant	To country	Seconded researcher	Duration	Starting month	1																								2																							
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
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Participant number	From participant	From country	To participant	To country	Seconded researcher	Duration	Starting month	1																								2																							
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7	MSU	RU	UKW	PL	ER	3	2		■	■	■																																												
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7	MSU	RU	SU	SE	MS	1	4				■																																												
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8	TSNUK	UA	UNIPA	IT	ESR	2	25																									■	■																						
8	TSNUK	UA	SU	SE	ER	1	18																		■																														
8	TSNUK	UA	UAIC	RO	ESR	2	27																											■	■																				
9	KSU	RU	Unifi	IT	ER	2	8								■	■																																							
9	KSU	RU	UNIPA	IT	ESR	4	4				■	■	■	■																																							
10	IFNUL	UA	UNIPA	IT	ER	2	1	■	■																																														
10	IFNUL	UA	UKW	PL	ER	1	10										■																																						
10	IFNUL	UA	UKW	PL	ER	2	16															■	■																																

Participant number	From participant	From country	To participant	To country	Seconded researcher	Duration	Starting month	1																												2																								
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
10	IFNUL	UA	SU	SE	ER	1	19																			■																																			
10	IFNUL	UA	IEG	MD	ER	2	35																																			■	■																	
11	IEG	MD	IFNUL	UA	ESR	2	25																								■	■																											
11	IEG	MD	TSNUK	UA	ESR	2	38																																						■	■														
11	IEG	MD	KSU	RU	ER	1	33																															■																				

5. Project management

5.1 Network organization and management

The management of the exchange scheme will be supervised by the project Coordinator and the committee. For the single work packages and the resukting deliverables we identified the patners that are responsable for the scientific content. They will report to the Commetee and are responsable for maintaining time constraints. Basically the management will be conducted by electronic delivery via round mails and communications on the FLUMENS projects web page in strong collaboration with the projects committee. The committee will meet at the start oft he project and after 6 month to tackle problems and issues related tot he setup oft he project. Thereafter the commettee will meet regularly on a 12 month basis (if needed also inbetween for specific purposes that might occur during the project life time). The comettee will discuss forthcoming activities and the exchange program. The commettee will also discuss and accept deliverables of the responsbale project partners and will communicate with EU in terms of reporting project activities and submission of respective reports.

Commette Meeting	*Month of project*
1. kickoff meeting	*1*
2. Meeting	*6*
3. Meeting	*12*
4. Meeting	*24*
5. Meeting	*36*
6. Meeting	*48*

5.2 Financial management

The budget will be entirely managend by the administrative department of University of Florence. Thus, also the transfer of money to the partner organizations will be done in accordance to the project programme. The coordinator will pass the financial requests of the partner organizations in accordance with the management committee to the financial department of UNIFI. The entire financial aspects related to the project will be monitored and checked by a controller who is part of the staff of UNIFI.

5.3 Secondment strategy

The practical organization of the secondment process is split up into three phases guided by the project management committee:

1 Phase: According tho the programme we identify sending and receiving institutions, duration of stay, start month as well as the researcher (ER/ESR) who will benefit from the action.

2.Phase: The project management committee will discuss the specific content of the tasks and work the researcher has to do in accordance with the work package leaders

3. Phase: After the stay the results obtained by the researcher have to be documented in a report that is evaluated by the work package leader and then passed to the project committee for final acceptance.

This secondment process will be done by internet meeting we will have in accordance to the committee metting (see 5.1)

5.4 Intellectual property

Intellectual property rights will be handles according to the agreement of good scientific practice published by DFG Germany that is send with the partner agreement to all of the partners.
(http://www.dfg.de/en/research_funding/legal_conditions/good_scientific_practice/index.html)

6 Impact

6.1 Expected impact to the scientific area, for the ERA and collaboration with the Third country partner organisations

6.1.1 Relevance of the proposed partnership to the area of collaboration and for the European Research Area2

The partnership's contribution to the area of collaboration

Erosion is producing sediments that are transported and stored within the catchments evoking problems concerning water quality and water quantity issues especially in semiarid to sub humid regions. Simple soil loss leads to reduced soil fertility and a reduced water holding capacity. Moreover sediments and nutrients from diffuse sources are transported into rivers and reservoirs. These sediments act as catalyst, transport and storage medium for physical, chemical and biological pollutions causing damages and external costs in the downstream regions. Consequently river runoff dynamics change and also water quantity and quality is modified. In this context the following research areas received mayor attention in the last decade: i) identification of the processes driving soil erosion, their spatial and temporal distribution, and intensity. ii) quantitative assessment of the loss of fertile top soil and the amount of sediments transported towards the river system ii) temporal and spatial scale issues in erosion process modeling to get information on plot but also on catchment scale iii) analysis of landscape sensitivities and forecasts of global change effects on landscape degradation iv) assessment of socioeconomic impacts of soil erosion by evaluation of “on site” and “off site” damages and v) development and implementation of management strategies and measures to fight erosion. Especially in regions with seasonal shortages in water resources and a long history of agricultural activities such as the Mediterranean ones the degradation processes and mechanisms are even more efficient and intense. Adequate methods of land use management which led to a reduction of soil erosion and correlated sediments is therefore of primary interest in these regions. Key questions are:

• how much and where in the catchment fertile top soil and nutrients are washed away and thereby leading to a reduced food production?
• how the hydrological dynamics of the catchment are changed due to reduced groundwater recharge and increased surface runoff (droughts and floods)? and,
• how much sediments are transported into the river network reducing water quality and environmental security such as the destruction of ecosystems, reduction of fresh water resources used for human consumption and irrigation?

To develop or improve existing methods the erosion processes and dynamics in a drainage network systems have to be analyzed. However, the degree of erosion is strictly related to landscape sustainability issues and related questions such as:

• What is the degree of vulnerability of a landscape and what is its recreation potential?
• How many people can live within a given landscape to guarantee sustainable conditions?
• What kind of farming is fitting best the sustainability-economy relationship?
• What kind of landscape management has to be applied to have sustainable conditions?

To get answers to this questions soil erosion modeling is a powerful tool to identify, qualify 2 Towards a European Research Area, version Brussels, 18 January 2000. COM (2000) 6 and quantify soil erosion processes and dynamics and therefore can be used to describe validate and forecast soil erosion and the associated processes. In the recent past the single erosion processes have been studied and subsequently modeled. Now the research is concentrating on integrating

erosion processes in order to describe the erosion dynamics of entire catchments. First attempts have already been made including also remote sensing and GIS technologies. The catchment erosion models have made quite progress from lumped models characterizing the average conditions of a catchment to semi-distributed and distributed models, following the trend in hydrological modeling. For a fully distributed erosion modeling the catchment must be separated into entities that are describing the single erosion processes mainly controlled by physical, and chemical soil properties and the respective geomorphologic settings. Entities with the same erosion process dynamics consequently consist in certain associations of soil characteristics and system inputs such as precipitation. They have the same system response related to erosion and are therefore called response units. Once delineated, these entities can be used for spatial scale transfer in regional erosion modeling.

As mentioned above qualitative and quantitative assessment of erosion processes made a great progress in the last decade due to an increase in computing capacity and programming as well as due to new measurement techniques. However, there are still a lot of open questions related to specific degradation processes especially in the Mediterranean basin. The Mediterranean catchment show several specific characteristics related to a highly seasonal climate with dry hot summers and winter rainfall. The precipitation can be very intense and its distribution is extremely variable. Due to climate change and climate variability in the last decades an increase in precipitation intensities as well as in dry periods were registered. Open questions remain concerning the localization of aquatic erosion processes such as rill-interrill erosion, rill erosion and gully erosion and the connectivity of these processes. On catchment or regional scale thresholds and landscape sensitivities as well as landscape resilience to erosion processes have only recently been focus to research activities. Moreover specific process associations such as badlands developed in weak marine and lacustrine deposits are still not fully understood. Particularly the function and distribution of subsurface erosion such as pipe systems and interactions of vegetation-substrate as well as physical-chemical relationships are still under investigation. Geomorphic processes like mass movements are intensely studied in the context of tectonic processes but their role on catchment scale and their interaction with other erosion processes need surely more attention. Furthermore it is becoming more and more evident that sedimentary series and paleosoils deliver a lot of information to decipherer process dynamics under paleoclimatic conditions. This information might help to adapt and cope with current and future process dynamics. Finally it should be mentioned that even though aquatic erosion processes currently play a mayor role in the Mediterranean basin, with increasing risk for droughts also wind erosion phenomena will have bigger impacts.
The research activities within the project will focus on the development and validation of water erosion susceptibility models. In particular, the research unit will deal with the key steps of preparing and testing maps aimed to represent how propensity of terrain to erosion spatially changes. The problem of the choice of the suitable mapping units, which is the first step of the developing of susceptibility models, will be handled by identifying and testing different types of spatial domains such as topographic units, slope units, regular grids, and combined types of them. Conditional analysis, discriminant analysis and logistic regression will be exploited and tested as tools to develop models linking the evidences of erosion on slopes (i.e. erosion landforms) and the spatial variability of environmental attributes, the latter expressing erodibility of outcropping materials and erosivity of flowing water. Different validation techniques will be also investigated, starting from the partition of the erosion landforms dataset according to spatial, temporal and/or random criteria; the susceptibility models will be trained on a portion of the dataset and will be tested on the other. The predictive skill of the models will be assessed by means of accuracy statistics based for example on contingency tables, prediction and success rate curves or ROC curves. Contribution of partnership is also concerned the following objectives:
− The elaboration of biotechnologies for the microorganisms potential using for improvement of soil and water quality, biological degradation of xenobioticals;
− The elaboration of biotechnological methods of water, air and soil quality monitoring.

The relevance of the exchange between the partner countries for ERA

Significance of this cooperation for ERA is displayed in several directions:
1. The project union's scientists from various fields, various Institutes and various countries. This cooperation creates the conditions for interaction of knowledge from one sphere to another, organize complex study of fluvial processes, erosion, ecological processes and climate changes, to search them all in cooperation.
2. Important sequence of project cooperation is experience exchange both in methodology and using equipment.
3. The project involves large territory of ERA. This fact allows studying river systems in various natural conditions.
4. There is still a problem of universal terminology in science. Cooperation of scientists from various countries will promote united conception of view on studied issues.
Each participant of the project is permitted to get new knowledge and skills.

6.1.2 Potential to develop lasting collaboration with the eligible Third country partners
The basis for sustainable and lasting cooperation between partners is joint work at project on its own account. All the results will be drawn by research groups consisting of researchers from various institutes and countries. They will present hem in combined publications. In the course of work new ideas will come. Its development will need more than 4 year of the project, that's why cooperation will continue. During the project many secondments are planned. In the course of the project we're planning to get a lot of new material. Its' processing and interpretation will need much time. Receiving of new results will be the strong motivation for lasting cooperation. Thus scientists of various fields are communicated in project; it will be the basis for future consultations.
Important part of the project is working out of Web site which will allow renewing results after the project will be finished, watching over the news in areas of interest, to communicate with partners. Joint dissemination of the project results is significant basis for cooperation. Attraction of young researchers initiates for future cooperation between them. Attraction of stakeholders which will be interested in new results in area of collaboration will promote development of cooperation. The project results will be used in training materials and if it's necessary they will be translated from English.

7 Ethical Issues (if applicable)

	Research on Human Embryo/ Foetus	YES	Page
*	Does the proposed research involve human Embryos?		
*	Does the proposed research involve human Foetal Tissues/ Cells?		
*	Does the proposed research involve human Embryonic Stem Cells (hESCs)?		
*	Does the proposed research on human Embryonic Stem Cells involve cells in culture?		
*	Does the proposed research on Human Embryonic Stem Cells involve the derivation of cells from Embryos?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	✓	

	Research on Humans	YES	Page
*	Does the proposed research involve children?		
*	Does the proposed research involve patients?		
*	Does the proposed research involve persons not able to give consent?		
*	Does the proposed research involve adult healthy volunteers?		
	Does the proposed research involve Human genetic material?		
	Does the proposed research involve Human biological samples?		
	Does the proposed research involve Human data collection?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	✓	

	Privacy	YES	Page
	Does the proposed research involve processing of genetic information or personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?		
	Does the proposed research involve tracking the location or observation of people?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	✓	

	Research on Animals	YES	Page
	Does the proposed research involve research on animals?		
	Are those animals transgenic small laboratory animals?		
	Are those animals transgenic farm animals?		
*	Are those animals non-human primates?		
	Are those animals cloned farm animals?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	✓	

	Research Involving Developing Countries	YES	Page
	Does the proposed research involve the use of local resources (genetic, animal, plant, etc)?		
	Is the proposed research of benefit to local communities (e.g. capacity building, access to healthcare, education, etc)?	✓	

	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		

	Dual Use	YES	Page
	Research having direct military use		
	Research having the potential for terrorist abuse		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	✓	

This section should include the information provided in section B.6 of the initial proposal, complemented, if relevant, by the remarks/observations from the "Ethical Screening Report". In case the proposal was submitted to an "Ethical Review", then the requirements listed in the "Ethics Review Report" must also be included.

PART C

8. Overall Maximum Community Contribution

Table 5. Indicative Budget (Table A3.1 from the GPF)

Participant number in this project	Participant short name	Country	Number seconded researchers month	Total EU Contribution (€)
1	Unifi	Italy	23	43,700.00
2	UNIPA	Italy	16	30,400.00
3	EKUT	Germany	19	36,100.00
4	UKW	Poland	19	36,100.00
5	SU	Sweden	18	34,200.00
6	UAIC	Romania	11	20,900.00
11	IEG	Moldova (Republic of)	7	13,300.00
TOTAL (€)			113	214,700.00

** This table contains all the beneficiaries and the EU contribution. All of them must submit a Form C for the intermediate payment of reporting period 1 and for the final payment at the end of the project.*

Pre-financing: This amount is intended to provide the beneficiary with a float in between periods and it would be agreed during negotiations. As an indication, for projects with one of two reporting periods, the amount of the pre-financing could be between 60-80% of the total Community financial contribution

Table 6. Indicative Secondments (Table A3.2 from the GPF)

Participant number in this project	Participant short name	Country	Amount of staff	Number seconded researchers month total	% Total	EU Contribution (€)
1	Unifi	Italy	8	16	15 %	30,400.00
2	UNIPA	Italy	4	8	7 %	15,200.00
3	EKUT	Germany	6	12	11 %	22,800.00
4	UKW	Poland	4	10	7 %	19,000.00
5	SU	Sweden	4	8	7 %	15,200.00
6	UAIC	Romania	4	9	7 %	17,100.00
7	MSU	Russian Federation	11	26	20 %	49,400.00
8	TSNUK	Ukraine	3	5	6 %	9,500.00
9	KSU	Russian Federation	2	6	4 %	11,400.00
10	IFNUL	Ukraine	5	8	9 %	15,200.00
11	IEG	Moldova (Republic of)	3	5	6 %	9,500.00
TOTAL EU/AC Participant		7	33	68	61 %	129,200.00
TOTAL Third Country Participant		4	21	45	39 %	85,500.00
TOTAL		11	54	113	100 %	214,700.00

** This table shows the number of fellow-months per participant. It is an indicative distribution that can be modified because of the project implementation needs. If the changes are not significant it is not necessary the modification of the Annex I but a clear explanation in the due periodic an final report.*

9. Grant agreement reporting

REPORT PERIOD	SCIENTIFIC MID-TERM REVIEW REPORT DUE AT MONTH	PERIODIC REPORTS* DUE AT MONTH	FINAL REPORT DUE AT MONTH**

1	12	24	
2	**25**	**48**	**48**

***** They include the activity and management reports and the financial statement (Form C)

The European Union support of Marie Curie Actions will be referenced in publications, conference papers, presentations and posters in connection with this project. This will include the sentence “This research was supported by a Marie Curie International Research Staff Exchange Scheme Fellowship within the 7th European Community Framework Programme”, as well as, if relevant, the EU and Marie Curie logos.

ENDPAGE

PEOPLE
MARIE CURIE ACTIONS

International Research Staff Exchange Scheme
Call: FP7-PEOPLE-2012 IRSES

Annex I

“FLUMEN 318969”