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Center for Meteorology and Environmental Prediction

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Project No.: **043670**

Project acronym: RRP-CMEP

**REINFORCEMENT OF THE RESEARCH POTENTIAL IN CENTER FOR
METEOROLOGY AND ENVIRONMENTAL PREDICTIONS**

Instrument: SSA

Thematic Priority: INCO

Publishable final activity report

Period covered:

from 01.01.2007 to 30.09.2009

Date of preparation:

22 October 2009

Start date of project:

01.01.2007

Duration:

33 months

Project coordinator name:

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Project coordinator organisation name:

University of Novi Sad, Faculty of Sciences

Revision: **1**



1. Project execution

The Centre for Meteorology and Environmental Predictions within Faculty of Science represents a fusion of four research groups (for Numerical Weather Prediction, UV radiation Forecasting, Agricultural Modelling and Forecasting and Air Pollution Prediction) which came together in order to concentrate their activities on environmental forecasts, particularly for application in the air and soil quality control, production of healthy food and public health services. In order to improve and firmly establish centre's capacities on RTD in environmental prediction and monitoring, RRP-CMEP is planned as a coherent set of coordination, dissemination and education actions directly aimed at improving, stabilising and reinforcing centre's research potential. At the end of the project period, being based on modern monitoring, information and computational technologies and with an access to hi-tech European infrastructures, the CMEP will become a very interesting for young scientists, offering better career opportunities through networking with other research centres in Member States or associated States and WBC (West Balkan Countries), having similar scientific interest, better work conditions and increased job opportunities, not only in the research sector of the country, but elsewhere in other institutions and also supporting and mobilising the human and material resources. In that way, one of the main objectives of the project are to promote in Serbia and WBC region, state of the art applications in environmental predictions established on the basis fundamental research in physics, meteorology, chemistry and biology following current social and economical needs of Serbia and making a productive intellectual atmosphere for young generation of researchers, thus avoiding "brain drain" phenomena.

In accordance to that, RRP-CMEP project objectives can be summarized in two groups:

Strategic objectives

- To contribute to strategic development of the European Research Area (ERA) i.e. to improve co-ordination, public awareness and preparation of future Community initiatives in environment protection and related safety aspects;
- To promote in Serbia and WBC region state of the art applications in environmental predictions established on the basis fundamental research in physics, meteorology, chemistry and biology following current social and economical needs of Serbia and making a productive intellectual atmosphere for young generation of researchers, thus avoiding "brain drain" phenomena;
- To promote and facilitate the dissemination, transfer, exploitation, assessment of past and present research results obtained by the CMEP and its European partners by means of a project web site and specially developed information-computational system;
- To prepare future WBC region RTD activities within FP6 via dedicated training program realised by means of e-learning and organisation of International Workshops.



Specific objectives

- To improve and reinforce research capacity in the field of the environmental predictions by means of highly sophisticated environmental models including: numerical weather prediction, agricultural forecasts, UV index forecast and monitoring and prediction of air pollution propagation from one point source, through lifting the computational and measuring equipment and software techniques on the higher level.
- To make a bridge between basic science and achievements and their applications in this field, to hire new young researchers and exchange researchers between CMEP and highly ranking EU scientific institutions and universities.
- To provide young researchers to visit EU scientific institutions and universities in order to direct their orientation towards applied environmental problems as well as to advance the state-of-the art by making EU diffusion of the first Serbia research results in environmental modelling.
- To develop, launch and support in operation the web portal as an internet accessible information-computational system providing: different forms of environmental prediction outputs, communication, discussion, dissemination and education platform related to different environmental issues for network participants, professionals, decision makers and general public.
- To use the web portal for offering the information about FP6 and FP7 INCO on relevant thematic, with special emphasis on WBC, giving to WBC researchers a vision of their research as an opportunity for activity development within ERA.
- To organise International Workshops for outstanding and prominent researchers, police and decision makers about current state in environmental and software modelling with emphases on environmental prediction.

Major achievements during the project execution

In accordance to objectives described in the previous part, majority of restructuring tasks were planed for the first project year, namely:

- Purchase of all planned equipment:
 - 72 – Processor PC cluster
 - Mictropos II Ozonometer
 - UV Solar simulator
 - Mobile polythermostat
 - Mini weather station
 - Labo autoclave
 - Reflectometer RQ-flex
 - Lap-top PC's (x 3)
- Preparation of dissemination plan
- Hiring of two young researchers

As it was elaborated in “The Periodic Activity Report” for 1st – 12th project month, all of these tasks were successfully achieved. Two young researchers are hired, one PhD student



(MSc Igor Balaž) and one MSc student (BSc Ana Ćirišan). Both of them also receive the governmental scholarship for exceptional postgraduate students.

In order to strengthen newly established Centre's structure and to make further progress toward completion of its declared strategic and specific objectives, mainly in the field of dissemination of knowledge and expertise (as stated in Annex I – "Description of Work" for RRP-CMEP project), major RRP-CMEP project objectives for the second year of the project (13th -24th project month) were defined as follows:

- Installation and usage of purchased equipment;
- Hiring of additional one young scientist;
- Completion of internet web portal;
- Creation of Centre's leaflet;
- Visits of EU experts to CMEP;
- Visits of senior scientists from CMEP to EU countries institutions.

As it was elaborated in "The Periodic Activity Report" for 13th -24th project month, all of these tasks were successfully achieved. Web portal was launched in the first part of the year and is fully operational on internet address <http://cmep.rs>. PhD student, Ana Firanj, was hired as an additional one young scientist. The Center was also a host for one expert from EU institution, namely Dr. Tamas Weidinger from Department of Meteorology, Eötvös Lorand University, Budapest, Hungary. Several senior scientists from CMEP visited EU research institutions: (i) Prof. Darko Kapor, visited Polytechnic University of Catalonia, Barcelona, Spain; (ii) Prof. Zoran Mijatović, visited Faculty of Sciences, Valladolid, Spain; (iii) Asst.Prof. Branislava Lalić, visited Kipp&Zonen Company, The Netherlands and (iv) Ass. Ilija Arsenić, visited ELTE University, Budapest, Hungary.

For the final period of the project duration (25th -33th project month) major objectives were defined as follows:

- Organization of the Workshop;
- Visits of EU experts to CMEP;
- Visits of senior scientists from CMEP to EU countries institutions;
- Visit of young scientists from CMEP to EU countries institutions.

These activities were also successfully achieved. Firstly, as a part of the Workpackage 3 "Organization of Workshops" of the RRP-CMEP project, international workshop entitled "Workshop on Modelling and Measuring Aspects of some Environmental Issues in European Union and National Projects" was held on April 27-29 2009, by the Center for Meteorology and Environmental Predictions. Proceedings of the Workshop will be published in the form of edited volume by the Nova Science Publishers, Inc. Secondly, EU experts who visited CMEP during the reporting period were: Dr. Simone Orlandini (Department of Agronomy and Land Management, University of Florence, Italy), Dr. Tamas Weidinger (Department of Meteorology, Eötvös Loránd University, Hungary), Michael Fitzka (Institute of Meteorology BOKU, Wien, Austria), Aida Muminović and Elma Kavazović (private company "Ceteor", Sarajevo, Bosnia and Herzegovina). Thirdly, several visits of senior scientists from CMEP to EU countries institutions were realized: prof. Dragutin T. Mihailovic, visited University Federico II, Naples, Italy and University of Aveiro, Portugal,



while dr Radivoje Jevtic visited BOKU University, Vienna, Austria. Finally, the following young scientist completed their visits: dipl. ing. Ana Firanj spent one week at the Institute of Meteorology (BOKU-Met), Working group Agrometeorology Department of Water, Atmosphere and Environment (WAU) University of Natural Resources and Applied Life Sciences (BOKU), Vienna, Austria, while MSc Igor Balaz spent three weeks at the Friedrich-Schiller-University, Germany in the laboratories of Dr. Stefan Artmann and Dr. Peter Dittrich.

2. Dissemination and use

Section 1 – Exploitable knowledge and its Use

| Exploitable Knowledge (description) | Exploitable product(s) or measure(s) | Sector(s) of application | Timetable for commercial use | Patents or other IPR protection | Owner & Other Partner(s) involved |
|--|---|--|-------------------------------------|--|--|
| 72-Processor PC cluster | -environmental predictions - platform for various mathematical models | - crop production - meteorology - modeling in natural sciences | 2009 | None | CMEP |
| CMEP web portal | -access to environmental prediction outputs -education platform - discussion and communication platform | - policy makers - education - science | None | None | CMEP |

Table 1: Overview table of exploitable results for the RRP-CMEP project

Description of exploitable results

72-Processor PC cluster

First exploitable result of the RRP-CMEP project is building of a 72 – Processor PC cluster as a necessary computational tool for performing various analyses within the scope of the CMEP activities. Some of the most prominent ones are: numerical weather prediction, agricultural forecasting, UV index forecasting and monitoring and prediction of air pollution propagation from one point source and also use of Monte Carlo method for different scientific purposes. Additionally, the cluster will be offered for running other mathematical models as a public commercial tool, applicable to various sectors within scientific community.

CMEP web portal

Making the CMEP web portal is marked as the next exploitable result of the RRP-CMEP project. Its main usage is as an information-computational system providing: different forms



of environmental prediction outputs, communication, discussion, dissemination and education platform related to different environmental issues for network participants, professionals, decision makers and general public (800 000 visits until this time). Web portal is launched on address: <http://cmep.rs>

Section 2 – Dissemination of knowledge

| Planned /actual dates | Type | Type of audience | Countries addressed | Size of audience | Partner responsible /involved |
|------------------------------|---------------------|--|---------------------------------|-------------------------|--------------------------------------|
| April 2009 | Conference | - Research | -WB countries - EU countries | - 40-50 | CMEP |
| June 2008 | Center's web portal | - General public - Research - Higher education | - public | - public | CMEP |
| December 2008 | Flyers | - General public | Serbia | - public | CMEP |

Table 2: Overview table of the dissemination activities for the RRP-CMEP project

Description of major activities

Conference

As a part of the RRP-CMEP project, a workshop entitled “*Workshop on Modelling and Measuring Aspects of some Environmental Issues in European Union and National Projects*“, was organized. Main audience was comprised of prominent researchers, police and decision makers, from both EU and WB countries, thus facilitating EU-WBC exchange of ideas and approaches both in basic and applied treatment. Additionally, young researchers hired under RRP-CMEP were included in different levels of organization of the workshop in order to get experience in this kind of meeting and communication. Also, searchable set of electronic documents concerning the organized Workshop, preparation of relevant multi-media material (Program, Abstracts, Proceedings), and publication of Proceedings in hard copy and e-copy forms was compiled in order to support the effectiveness of dissemination. The final result of this workshop is a book “Advances in environmental modelling and measurements” with 23 selected papers. This book is published by Nova Science Publishers, New York and it will appear in March next year.

Center's web portal

CMEP web portal is planned as a main instrument for dissemination of the project's progress, relevant supporting, educational and scientific informational resources, prepared by the



experts in the field from EU and WBC. Information on ongoing projects of FP6 of relevant thematic, which will be retrieved from the Commission server and gathered from such project co-ordinators/participants via informal contacts of the Network key personnel, will also be disseminated via web portal and the organised events. Web portal is launched on address: <http://cmep.rs>.

Flyer

Leaflet about CMEP and RRP-CMEP is designed in order to inform, mainly general public (or the part which does not use the Internet), about the capacities of our laboratories and researchers, their involvement in national, regional and international projects. The flyer is also available in the pdf format on the web portal.

