



EUROPEAN UNION



GOVERNMENT OF ROMANIA



SERBIAN GOVERNMENT



Structural Funds
2007-2013



ENVIROBANAT
Common History. Common Future

The importance and realization of the project „Sustainable development of a research center in Banat and Danube flow area through scientific research and environmental simulation tools access and evaluation threats”, by the research team from Serbia

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ENVIROBANAT CONFERENCE
09 - 10 June 2014, Zrenjanin, Serbia

In the frame of the project

Sustainable development of an research center in Banat region and Danube flow area through scientific research and environmental simulation tools to asses and evaluate potential threats

www.envirobanat.ro



Common borders. Common solutions.

General data about Serbian part of the Banat region



Area		Population,		Population density, inhabitants/km ²	Arable area, %
9 830 km ²	12 %	623 868 inhabitants	8,76 %	73	85

University of Novi Sad, Serbia



- ✓ Founded on 28. June 1960.
- ✓ The oldest University in APV
- ✓ 43 770 BSc students
- ✓ 6 588 MSc and PhD students
- ✓ 5097 employees
- ✓ 3 711 scientific staff members

University consists of:

- ✓ 14 Faculties
- ✓ 2 Institutes, and University Centers
- ✓ 10 Associations of Centers for Interdisciplinary and Multidisciplinary Studies and Research

Technical Faculty “Mihajlo Pupin”



- ✓ Located in Zrenjanin, Serbia
- ✓ Member of University of Novi Sad
- ✓ Founded in 1974.
- ✓ 1 700 Students
- ✓ 7 BSc Programs
- ✓ 7 MSc Programs

Faculty organizes internships for students with local companies

Faculty takes part in many national and three IPA-CBC projects

Faculty has been reaccredited

The Projects

Project activities now and in the past:

- Cooperation between University of Novi Sad and Politehnica University of Timisoara
- Cooperation between Technical Faculty “Mihajlo Pupin”, Zrenjanin and Faculty of Mechanical Engineering, Timisoara;
- Third project in continue between our Faculties and research teams;
- Many scientiests, researchers and students were included in project activities

Development of the Laboratory at TF Mihajlo Pupin

**Laboratory of environmental protection
and energy efficiency has been formed
through projects funded from IPA-CBC
funds**

- ✓ Air quality monitoring
- ✓ Water quality monitoring
- ✓ Soil quality monitoring
- ✓ Simulation of pollutants dispersion

Project MIS ETC Code: 1425

Project title: Sustainable development of an research center in Banat and Danube flow area through scientific research and environmental simulation tools access and evaluation threats

Main implemented activities

- 28. August 2013 - Project opening in Zrenjanin, with more than 100 stakeholders;
- 5-6. September 2013 - Workshop in Zrenjanin (Hunter Castle Ecka), with more than 70 stakeholders each day; Presented strategy of project implementation and scientific base for research in this area

The Important events - Project opening, 28. August 2013



The Important Events - Workshop, 5. and 6. September



Research team



Procurement activities

Budget for equipment procurement:

V EQUIPMENTS AND GOODS					98000.00
1	IT equipment. Fully equipped PC's with minimum requirements: I5 tipe quad core processor, 4 Gb memory, 1 Gb video card, 19" capable for high rate numerical simulation	pc.	20	2000	40000.00
2	<i>Air Dispersion Simulation software package.</i> The package consists on dedicated simulation model based on simplified Navier-Stokes equations, Steady-state Gaussian plume air dispersion model and non-steady-state Lagrangian model, all fitting Planetary boundary layer theory and turbulence scaling concepts	pc.	1	20000	20000.00
3	<i>Spectrophotometer.</i> Spectrophotometer is necessary to extend our capabilities to water and soil analysis in order to make a complete evaluation on Banat Environment (Air, Water, Soil). The photometer must have a minimum spectral range of 190 - 1100 nm.	pc.	1	15000	15000.00
4	<i>Meteorological station.</i> Minimum sensors: wind speed and direction, air temperature, humidity and pressure. The data collected is necessary for air pollutant dispersion studies.	pc.	1	9500	9500.00
5	laser printer	pc.	1	1500	1500.00
6	CFD software based on a solver for full Navier-Stokes equations having at least following modules: preprocessor, solver, postprocessor	pc.	1	7000	7000.00
7	<i>GIS maps for Banat area and Danube effluents,</i> in formats suitable for simulation softwares, like BMP, LULC DXF, DL6, Shapefile or any other proper geographical formats	pc.	1	5000	5000.00

IPA CROSS-BORDER COOPERATION PROGRAM, ROMANIA-REPUBLIC OF SERBIA, 2013

Equipment bought through the project:

- Water pollution monitoring equipment, spectrophotometer
- Multifunctional copier machine Ineo+ 224e
- Meteorological station
- 20 personal computers for support software for simulations of environmental quality
- Latest versions of softwares for following dispersion of contamination in air and water: ADMS-5 - CERC, ADMS-Urban - CERC, FLOWSTAR - CERC, GASTAR, PHOENICS, GIS maps of the Banat region
- All softwares may be used to simulate accident situations in air and water pollution

Computers



Lenovo Think Station E32

Processor

Intel Xeon E3-1220 e3 Processor
(8MB Cache, up to 3.50GHz)

RAM 8Gb

HDD 500 Gb

Video Adapter

NVIDIA NVS315 (DMS-59) - 1GB
(ATX) with DMS-59 to Dual DVI
(single link) Dongle

Monitor Lenovo LC2223PWC 22"

Multifunctional machine Ineo+ 224e



Copy and Print up to 22/22 A4 pages per minute and up to 14/14 A3 pages per minute in color or black /white

Scan up to 80 pages per minute in color Original/160/sw

Fax with Super-G3-Fax option for fast transmission and digital reception, auto fax forwarding, time shift, PC-Fax, Receipt to confidential box, Receipt to email,

Spectrophotometer



Principle of operation: Double-beam monochromator with stray light reduction

Spectral range: minimum 190 ÷ 1100 nm

Application: quantitative and qualitative measurements

Includes: Operational control software: preprogrammed methods, Spectra presentation and handling, lamp control, validation module for quality assurance of the analysis, wavelength calibration, spectra recording and analysis, reports

DR 6000 UV VIS Spectrophotometer Hach-Lange, Origin Germany
Use: for the water quality analysis

Sampling spots



Meteorological station



LSI LASTEM , Origin Italy

Temperature: min -40 ÷ 55 °C, accuracy < 0.3 °C (ventilated)

Relative humidity: 0 ... 100 % RH, accuracy < 2% RH (ventilated)

Air pressure: 300 ... 1200 hPa, accuracy < 0.6 hPa

Wind direction: 0 ... 359.9 degree, accuracy < 3 degree

Wind speed: 0 ... 75 m/s, accuracy < 5 % of range

Quantity of rain

Software

- ✓ **ADMS-5 - CERC**, With atmospheric boundary layer properties are characterised by boundary layer depth and/or Monin-Obukhov length. Dispersion under convective meteorological conditions: skewed Gaussian concentration distribution, Licensing: multiple user PC's/licence
- ✓ **ADMS-Urban - CERC**, Dispersion ranging from the simplest scenario complex urban scenarios. Area: multiple industrial, domestic and road traffic emissions over a large urban area. Advanced dispersion model / boundary layer: height of the boundary layer and the Monin-Obukhov length. Licensing: multiple user PC's/licence

Software

- ✓ **FLOWSTAR - CERC**, Characterisation of boundary layer: boundary layer height and the Monin-Obukhov length. Boundary layer variables: wind speed, turbulent velocities, energy dissipation, buoyancy frequency, temperature, density. Licensing: multiple user PC's/licence
- ✓ **GASTAR** is a dense gas dispersion model developed by CERC ideally suited to modeling accident and emergency response scenarios or investigating site safety involving releases of flammable and/or toxic materials from a variety of industrial accidents such as cryogenic spills, catastrophic tank failure, pipe fractures and multi-phase jets. Licensing: multiple user PC's/licence

Software

- ✓ **PHOENICS**, Air and water dispersion of pollutants based on Computational Fluid Dynamics; Principle: finite volume method for solving the set of conservation equations: Navier-Stokes equations, continuity equation, energy equation and chemical species, Licensing: multiple user PC's/licence
- ✓ **GIS maps**, Area: Serbian Banat Resolution: 30 x 30 meters, Format: LULC or DXF or DL6 or Shape file or USGS

In tender was 90 x 90 meters resolution

All planned procurements are finished successfully. The planned equipment is bought.

Conclusion

- The prosperity of Banat region is based on the development in agriculture, specially for healthy organic food production, and in the food-production industry the very important is certificated laboratory for monitoring environment. With this project we increase the competition of the Laboratory for environmental engineering of our Faculty and make good research center for research and education of students at all levels. It is important to tell that we are across the Project increased the knowledge of researchers at our Faculty and University, specially in environmental simulation activities.

Thank you!

Special thanks to the EU for supporting this project!