

NOVEMBER Progress Report – 2014

SfP 984440

**A model to predict and prevent possible disastrous effects of toxic pollution in
the Tisza River watershed**

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24 November 2014

c) The Summary Report

Annex 7

OUTLINE OF THE SfP SUMMARY REPORT

**SfP – Model to predict and prevent disastrous toxic pollution effects in the Tisza River watershed
SfP – 984440**

A Model to Predict and Prevent Possible Disastrous Effects of Toxic Pollution in the Tisza River Watershed

Project Co-Directors:

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Approval Date: **20 November 2012**

Effective Date: **26 February, 2014**

Duration: **3 (three years), February, 2017**

NATO Budget: **248,750.00 EUR**

Information about the SfP Project through Internet: <http://granturi.ubbcluj.ro/NATO984440/>

Abstract of Research

The research of the project is focused on the creation and implementation of a model of joint monitoring, forecasting and coordination of actions to prevent pollution in the Upper Tisza watershed in Ukraine and Romania. The model has three component such as: 1. methodology for the inventory of the main sources of pollution and substances that can penetrate into the river in emergency situations based on European requirements; 2. methodology for the identification and quantification of the chemicals with potentially toxic effect in the Tisza River ecosystem based on biological, instrumental and radiocarbon analyses; 3. Creation of a GIS (geographical information system) compatible model based on comprehensive GIS data layers, Digital Elevation Models (DEM) and other specific layers like: pollution hot-spots, land use, climate, rainfall and so on, to assess the scenarios of emergency situation by computer simulation in order to provide data about the effect of pollution in a short time in order to prevent the consequences over the human and environmental health. Special attention is focused on the development of a guideline for a common preventive plan between Ukraine and Romania, for the Tisza River Basin, to minimize the negative pollution consequences related to the NATECH events.

Major Objectives

The overall goal of the project is the creation and the implementation of a system of joint monitoring, forecasting, information sharing, and coordination of actions to prevent pollution in the Upper Tisza watershed in Ukraine and Romania. **The auxiliary goals** are the know-how to Ukrainian authorities/researchers and building the capacity of research groups to independently carry out up-to-date the environmental studies on pollution transport, floods, early-warning and disaster prevention. The Project will address the following general objectives:

- 1) Inventory of the threats and hazardous sources on the territory of Romania and Ukraine based on the European requirements for data acquisition, analysis and reporting.
- 2) Elaboration of the list with the hazardous substances that can enter into the river in emergency situations.
- 3) Harmonization and development of the sampling and analytical procedures for the determination of the river pollution in agreement with the WFD and EQSD requirements.
- 4) Identification of the River Basin Specific Pollutants using the bioassays and the modern analytical techniques.
- 5) Development of method for the monitoring of emergency situations using the radiocarbon analysis.
- 6) The assessment of a scenario based on emergency situations in a pilot area by computer simulation.
- 7) Development of a guideline for a common preventive plan between Ukraine and Romania for the Tisza River Basin, to minimize the negative pollution consequences related to the NATECH events.
- 8) Dissemination of knowledge and expertise to end-users and stakeholders in Ukraine and Romania.

Overview of Achievements since the Start of the Project until (30 September of current year)

The achievements of these six months consist in the complete performing of the Action 1.1. Watershed characteristics and land use. Other Actions such as 1.2. Creation of a database of potentially dangerous sources of pollution and hazardous substances that can penetrate into the river in the event of an emergency;

3.1. Selection on a suitable model for a pilot basin in Romania. 3.2. Gathering input data and converting it for GIS usage in the model; 3.3. Creating scenarios of river pollution by toxic substances in emergency situations (by using the selected model) and 5. Dissemination of results to all end-users, stakeholders and general public using the project website, and written reports have been started. New other activities programmed to start only after six months such as 1.3. Determination of "hot spots" - the places of the water sampling for the analysis of the river pollution by the dangerous substances; 2.4. The development of methods for the determination of organic pollutants using chromatographic techniques and chromatography-mass spectroscopy analysis; 2.6. Field investigations in the upper Tisza River Basin in Romania and Ukraine in order to determine the actual pollution using the existing standardized methods of analysis and the methods developed in the project has been started and the first obtained results have been disseminated to the scientific communities.

- **Payments through NATO Funds: 15.005,41 EUR**

- **Milestones for the Next Six Months**

For the next six months will be finished the 3 actions such as 1.2. Creation of a database of potentially dangerous sources of pollution and hazardous substances that can penetrate into the river in the event of an emergency, 1.3. Determination of "hot spots" - the places of the water sampling for the analysis of the river pollution by the dangerous substances and 3.1. Selection on a suitable model for a pilot basin in Romania.

Will be continuing the actions 2.4. The development of methods for the determination of organic pollutants using chromatographic techniques and chromatography-mass spectroscopy analysis; 2.6. Field investigations in the upper Tisza River Basin in Romania and Ukraine in order to determine the actual pollution using the existing standardized methods of analysis and the methods developed in the project; 3.2. Gathering input data and converting it for GIS usage in the model. Data sources and data of water quality measurements; 3.3. Creating scenarios of river pollution by toxic substances in emergency situations (by using the selected model) and 5. Dissemination of results to all end-users, stake-holders and general public using the project website, and written reports.

Also, in this period special attention will be paid to the acquisition of a gas chromatograph coupled with mass spectrometer by the PPD, its installation and training as a necessity to develop in well conditions the actions 2.4. and 2.6. by the PPD.

NPD will acquire a mass spectra library and software for the HPLC data acquisition necessary for the fractionation of water and sediment extracts by semi-preparative chromatography. The VAT for NPD will be supported by the Babeş-Bolyai University.

- **Implementation of Results**

For the implementation of the project results the way chosen was to invite end-users and stakeholders to participate at the common project meetings. Such a meeting was organised between 27th - 29th of May, 2014 in Uzhgorod, Ukraine, and another is planed to take place in Romania, between 27th -28th of November, 2014, at Sighetu Marmatiei.

- **NATO Consultant**

Dr. Jaroslav Slobodnik, Environmental Institute, Koš, Slovak Republic.

- **Other Collaborating Institutions**

End-Users

- i) State Service of Ukraine for Emergency Situations, Kyiv, Ukraine
- ii) Hydrometeorological Centre of Ministry of Ecology of Ukraine, Kyiv, Ukraine
- iii) Central Geophysical Observatory of of Ministry of Ecology of Ukraine, Kyiv, Ukraine
- iv) Territorial Department of SSES of Ukraine in Transcarpathian Region, Uzhgorod, Ukraine
- v) State Ecological Inspections in Transcarpathian Region, Uzhgorod, Ukraine
- vi) Transcarpathian Regional Centre for Hydrometeorology of State Service of Ukraine for Emergency Situations, Uzhgorod, Ukraine

Stakeholders

- i) Maramures Agency for Environmental Protection, Baia Mare, Romania
- ii) Maramures Inspectorate for Emergency Situations, Baia Mare, Romania

Intellectual Property (IP) Rights

Not the case at this moment

Abbreviations: *(give full expression for all abbreviations which occur in this summary)*