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# Interreg - IPA CBC



Greece - Republic of North Macedonia

## Preven-T

***D5.1.5. An external expert with experience in evaluation issues will evaluate all project actions and will draft the relevant technical report.***

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Project Preven-T consists of the following Work Package (WP) and Sub work Package (SWP):

**WP1: PROJECT MANAGEMENT AND COORDINATION**

- SWP1.1 Project and Financial Management
- SWP1.2 Steering Committee Meetings
- SWP1.3 Audit
- SWP 1.4 Risk and Quality Assurance Plan

**WP2: COMMUNICATION AND DISSEMINATION**

- SWP 2.1 Communication Plan
- SWP 2.2 Project website
- SWP 2.3 Dissemination Events
- SWP 2.4 Social Media and Electronic Communication
- SWP 2.5 Dissemination Material

**WP3: OBSERVATIONAL AND FORECASTING FIRE AND POLLUTION MODELS**

- SWP 3.1 “Modeling Information System for monitoring of forest area, forest fire detection and early warning”
- SWP 3.2 “ Development of Capacity for dealing with forest fires”
- SWP 3.3 “Surface water and fragile vegetation pollution model, due to acid rain caused by air pollutants”

**WP4: HYDROMETEOROLOGICAL REPERCUSSION MODELS**

- SWP 4.1 “ High resolution weather forecast model
- SWP 4.2 “Local hydrological model for basin’s run - off and torrent’s discharge estimation on Pelister’s Park area”
- SWP 4.3 “Innovative techniques to detect the existence of discontinuities in Axios river embankments due to mammalian action”.

**WP5: CREATION OF WARNING AND EDUCATIONAL “CIVIL PROTECTION” STRUCTURE**

- SWP 5.1 “Upgrade of the existing Information Center in NP Pelister and development of Laboratory in the area of Disaster and Risk Management for educational and research purposes”
- SWP 5.2 “Emergency Management Frameworks E.M.Fs”
- SWP 5.3 “Educational and Training Seminars for students and Citizens of endangered Areas aiming to their awareness and preparedness against Natural Disasters and Technological Risks”
- SWP 5.4 “Compilation of a MSc program related with Natural and Technological Disasters and Risks”

The first SWP includes capacities for rapid forest fires fighting. The creation of that capacities provide fast reaction after receiving of warning for detection of forest fires by the system (WP3.1). Incorporation of Information System for monitoring, detection and early warning developed by the P2 with the help of P1, in the National Park Pelister provided enough information for decision makers to smartly engagement of developed capacities for fighting with forest fires, reduce the time needed for extinguish the forest fires and reduce damages and loss of the endemic flora and fauna which is very important part of the National Park. This capacity consisted of a) Fire ignition alert with the help of the under WP3.1 early warning system, b) Development of instant fire-fighting protocols supplied and supported by GIS and Drones techniques and information for focused and rapid intervention, c) Maps of all fresh water sources (exploited or no) of the entire area and preparing with the help of AHS method route maps with the shortest routes for fire – fighting vehicles.

From the above mentioned tasks, the under a and b completed with success while the under c one was provided by Pelister Park’s team as a deliverable of another project that it was implemented in the past.

The beneficiaries were firstly the visitors of the Park. Moreover, the whole protocol could be offered as a courtesy to all Forest authorities of Greece and North

Macedonia, that are established in the entire area, because the forest species and the climatological conditions are similar with the ones of Pelister.

In continuation, under the SWP 3.3 realized the following deliverables:

1. A technical report relevant with the application of the HYSPLIT back-trajectory model and the Lagrangian Particle Dispersion Model FLEXPART-WRF
2. An application of a surface water and fragile vegetation pollution model for Pelagonia district and Kastoria, Florina, Pella and Kozani Prefectures.
3. Water pollution maps (Pelister's eye, Prespa, Ohrid, Veggoritis, Kastoria), while the beneficiaries.

The above mentioned deliverables presented high scientific standards and have a high value as are based in numerous prototype measurements realized by the equipment which was installed by the scientific team of project PREVEN-T both in Pelister's area as well as in 4 lakes (Veggoritis, Kastoria, Prespa and Ohrid).

Furthermore, atmospheric modeling simulations were performed with WRF-CHEM modeling system (WRF\_v4.1). The system includes fully coupled atmospheric physics and chemistry modules for the description of the life cycle of gases and particle pollutants in the atmosphere. The model configured in a nesting domain structure allowing higher resolution up to 1x1 km over the area of interest.

Observational data from the meteorological stations (installed in the Pelister's Park area but in the mirroring area of break territory, as well) inside the modeling domain assimilated in the modeling system to improve the description of local conditions. These meteostations purchased by the Partners (4 items by P1 and four items by P3), for the needs of this project. The existence of such a network of the new installed weather stations at the area of interest, provided an assimilation of more and better-quality data, improving strongly the forecasting capability of WRF-CHEM modeling system.

Deliverables of this SWP were:

1. Validation of the WRF-CHEM modeling system

2. Operational forecasts and continuous feed of observations over the target area of Greece and Northern Macedonia, while the beneficiaries from the implementation of this WP4.1 were, the populations of the Pelagonia district and Kastoria, Kozani, Florina and Pella prefectures (farmers, forest – harvesters, fishermen, tourists, visitors, GEOTEE members, (Foresters, Agronomists, Geologists, who are working in the eligible area, etc) due to the fact, that this model was much more accurate than any other National or Regional meteo – forecast model realized in both countries, because of its strong local character based in local – real time observations.

Simultaneously with the implementation of the atmospheric forecast model of the entire Pelister's Park area, under project PREVEN-T there was an implementation of local hydrological model, with the help of Automatic Meteostations' installation in the above region.

For the needs of the implementation of this specific model 4 meteostations are installed in N. Makedonian territory. Moreover, a flow discharge and water velocity station installed in the central bed of Dragor river in the part which flows within the urban area.

The above mentioned equipment provides a serie of prototype measurements which are of a great value for implementing a local model. This model prepared by the scientists who are dealing with Hydrology matters and are involved in the Project. It is indeed an innovative model with accurated forecasting possibility something indeed crucial for the visitors of Pelister's Park area, the population of Bitola city and the farmers and villagers of the entire Bitola flood plain area.

This deliverable (WP 4.3) deals with the detection of damage to the embankments due to the activities of wild animals, so that it is possible to repair them in time in order to reduce or even eliminate the risk of occurrence of flood phenomena due to them.

The study area that was initially chosen to place trail cameras is the Axios river, as for this area there were several reports about the presence of a large population of myocastors, but also a personal observation during the on-site autopsy.

As a conclusion we can say that the method of trail cameras present remarkable results as far as it concerns the detection of mammals existence, inside the bodies of the embankment. This method is simple and cheap and it is not affected by the vegetation density, something that affects all other methods which referred before and which are complicated and expensive.

Nevertheless, the recent presence of Mammals inside the holes must be confirmed by the use of Gas detectors, who detect gases produced by the vital functions of the mammals, something that was illustrated in the information sheet which filled in the field, with the appearance of increased values.

Both actions, trail cameras photos and values of vital functions gases are the proofs for mammals presence in the rivers embankments.

A major outcome of the project was the upgrading of the already existed Information Center, and the development of a Laboratory for educational and research purposes in the premises of P2, which will be in the future in continuous connection with P3' s information center. All partners contributed to this endeavor.

The result was the establishment of an upgraded Information Center in NP Pelister and Development of a Laboratory for educational and research purposes in the field of disaster and risk management in the premises of P2.

Beneficiaries of this SWP implementation are the visitors of Pelister's Park as well as the whole population of Northern Macedonia, due to the fact that P2 is an organization that operates in a national level addressed to the residents of the whole country.

The SWP 5.2 aims to the preparation of Emergency management frameworks for Pelister area. The beneficiaries of this 5.2 Workpackage implementation, are the visitors of Pelisters Park as well as the population of the surrounding area (Bitola city, etc). Moreover the above emergency management frameworks, could be offered by Pelisters' Park authorities to any neighborhood Civil Protection Authority of North Macedonia of Southeastern district, Vardar district and Pelagonia district, as well as to the Civil Protection Authorities of Kastoria, Pella, Florina and Kozani prefectures. The

above mentioned Greek prefectures have already been supplied with Emergency Management frameworks by Greek Civil Protection Secretary, but by taking these brand new Emergency management frameworks into consideration, could probably improve their own EMF plans, given that these are plans of neighborhood areas with similar geomorphological and vegetation cover conditions. Both Greek EMF plans that already existed and N.M EMF plans that has been implemented under this project, could be used for the realization in the future of some common Transboundary EMF plans. This will be a very useful tool for the Civil Protection Authorities of Both Countries.

As far as it concerns the SWP 5.3 the deliverables are:

1. E- Learning platform development for both countries
2. Primary school educational and training material, for schools of both countries
3. Secondary school education and training material, for schools of both countries
4. Training programs and seminars for adults relevant with natural disasters and technological risks

The beneficiaries of this Workpackage implementation are, students of primary and secondary schools of NMK and Greece, of the areas along the border line between Greece and North Macedonia (Pelagonia Vardar, South District, Florina, Kastoria, Pella, Kilkis, Kozani). Nevertheless, these programs could be used for educational and training purposes in the whole territory of the two countries. In addition, beneficiaries of the four deliverables are the residents, tourists and visitors of the abovementioned villages, towns and cities.

Finally, the under 5.4 SWP corresponds to a preparation of an MSc Programme relevant with Natural Disasters focused in the cross-border area of the two countries taking into consideration their particularities.

The deliverables are:

1. Joint Master's program -Teaching and learning objectives
2. Joint Master's program - Rules and regulations
3. Joint Master's program – Core courses syllabus

#### 4. Joint Master's program Masters management system

The beneficiaries are North Macedonian and Greek citizens from the eligible area, that are interested for MSc studies, in the field of analysis and management of natural disasters and technological risks, as well as, in human factors intervention for prevention and mitigation of the above risks, who belong to the above mentioned groups.

As an overall, this specific project with acronym PREVEN-T except its interest and prescribed doubtless value for the population of the cross-border area of the two countries, presents remarkable scientific results and models that belongs to the level of other European and Global projects funding protocols, like HORIZON, ERA-net e.t.c.

The findings, results, models and proposals of PREVEN-T, could be indeed part of some other project elaborated under the framework of the afore-mentioned protocols, which, as it is very well known, usually appear much more higher budget.