



LANDSLIDE RISK ASSESSMENT MODEL FOR DISASTER PREVENTION AND MITIGATION (LANDSLIDE)

Co-financed by the EU



Humanitarian Aid
and Civil Protection

“The LANDSLIDE project investigates practical methods for the evaluation of the landslide hazard level from daily weather data, and proposes a new approach for the assessment of a medium-long term index taking into account the effects of climate change”.

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For more information check out the LANDSLIDE project website at:
www.landslideproject.eu

The LANDSLIDE project has almost come to an end. The final phase of the landslide project has, above-all, concerned the continuous testing, implementation and fine tuning of the Landslide Hazard Assessment Model and Software. In fact, the partners responsible for the pilot areas (Region of Smolyan, Bielsko-Biala District, National Observatory of Athens) have continuously tested the Landslide software in their respective test areas. The main critical issue raised by the pilot areas has been the evaluation of the hazard map reliability. As such, the biggest challenge now for the Landslide software is to continue to produce daily hazard maps, that must be tested against landslide event occurrence.

Another important activity has been the setting up of both “Local Cross-sector Risk Prevention Platforms” and the carrying out of a series of “Prevention Days” in the partner territories. The implementation of these activities is an important step towards a sustainable approach to risk prevention, both cross-sectors (i.e. by involving different public services or sectors concerned, in risk prevention activities) and at different levels (e.g. by involving citizens in risk prevention activities). At page 4-6 you can read about how partners are working towards such an approach, e.g. how Bielsko-Biala District involved 90 volunteers in one of their Prevention Days, how the Region of Smolyan formed a Regional Council to improve coordination and interaction between organisations and institutions in the region with the aim to reduce the risk of disasters, or how the Marcher Region „teaches” university student,s in the framework of their course of Environmental Sciences and Civil protection, about the important support the LANDSLIDE software could give to local authorities in the monitoring activities or in the risk management field.

The final conference of the Landslide project was held on the 10th November in Patras – Greece, followed by study visits on the following day. The conference was jointly organised by the National Observatory of Athens and the Region of Western Greece. Fruitful exchange and synergies with the RECALL project could also take place, thanks the valuable participation of several RECALL representatives in the Landslide conference. You can read more about the conference outcomes on page 7.

The Landslide project will officially end by the 31 December, however, partners will continue to use and apply the Landslide Hazard Assessment Model and Software whose reliability will improve over time. An important and crucial step forward would be, both to extend its effective application to a larger surface of the partner territories, and to replicate the model and software to an important number of new territories. This may be the objective of a new European initiative.

Enjoy reading!

*Pierluigi Maponi
Project Coordinator*



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'Landslide Software'

Training Platform

In the framework of the LANDSLIDE project ICT-BAS has developed a web-based tool for online data collection and hazard maps calculations for landslide prone territories in the four test areas in Italy, Poland, Bulgaria and Greece. The web-based software collects meteorological information from every test site via Internet connections and fills in a dedicated database every 3 hours with the meteorological conditions for the specific locations. These inputs are very important for a calculations module developed by the team at University of Camerino in Italy, which combines all database information with soil structure and local specific geological conditions resulting into a hazard map with the colours red, yellow and green, depicting the severity of the calculated potential for the period in the specific location according to the meteorological conditions and soil specifics. The most vulnerable areas are in red, and the one which are in the safe zone are in green.

All information is available on the dedicated web site of the project under the tool menu (figure 1.)

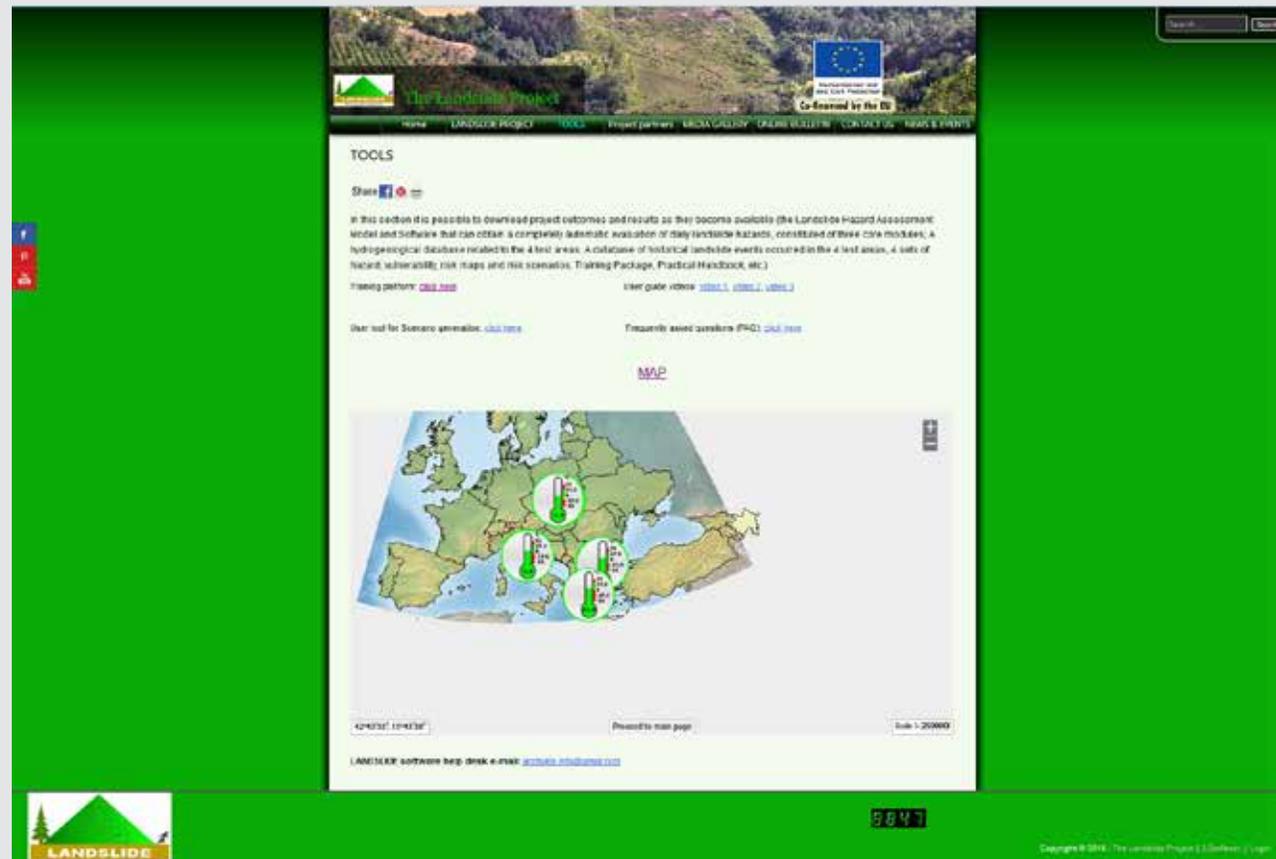


Figure 1: View of the Software platform and its user supporting tools, animated user guides, training platform and FAQ sections

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To disseminate the achieved results, representative of IICT-BAS has presented on the world GIS days in Sofia on 16th November 2016, all information available for the software platform and its tools.



Dissemination materials and posters were distributed to the participants.

On 2nd December 2016 a dedicated stakeholder education, within the prevention days, organised by the Region of Smolyan took place in Smolyan city.

All results and materials along with the handbook in Bulgarian had been distributed among the participants. Local media took interviews from the IICT-BAS participants. The regional governor of Smolyan gave a speech about the importance of such useful tools in areas where landslide vulnerability is very high as it is in Smolyan region. More information about the prevention days in Smolyan and local media publications are available on the official web-site of the project: <http://landslideproject.eu/index.php/news-events/>





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LANDSLIDE Cross-sector Risk Prevention Platforms and Prevention Days

District of Bielsko-Biala

The District Office of Bielsko-Biala, being a partner of the European project called: "**Landslide risk assessment model for disaster prevention and mitigation**" organised, on August 13 this year, the first prevention day out of many to follow. Such events are designed to help the audience to understand the risks related to the possibility of landslides occurrence.

The meeting took place in the village of Bystra, in the framework of Spartakiad organised for the members of volunteer fire brigades from the District of Bielsko-Biala. The main organisers were the District of Bielsko-Biala and the Commission of Youth Firefighting Squads of Bielsko-Biala District.



The event was attended by about 90 volunteer firefighters and the representatives of Bielsko-Biala District Office. The guests were made acquainted with the mission of the project, its duration, objectives, goals, current stage of implementation and the software elaborated to predict the occurrence of earth movements.

In addition, each participant was trained on the subject of landslide. The particular attention was paid to the prevention and response to the movements of the earth. Thanks to the project's expert, Jacek Gancarczyk being the employee Commune Office in Czernichów, the members of volunteer fire brigades learned the practical measures for which they will hold responsibility in case of an activation of a landslide. The above-mentioned expert made the participants familiar with actions which were taken during the strong movements of land masses that occurred as a result of heavy rainfall in Miedzybrodzie Bialskie within the Laski housing estate in 2010, which caused geological subsidence and destruction of about 117 summer cottages.

The positive result of the meeting was the fact that the members of the volunteer fire brigade expressed their desire to expand their expertise in the scope of prevention and response measures taken during the occurrence of strong earth movements; moreover, there were planned the systematic practical exercises supporting the actions taken in real situations.



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LANDSLIDE Cross-sector Risk Prevention Platforms and Prevention Days

Regional Administration Smolyan, Bulgaria



Two national experts from the Ministry of Interior took part in the meeting. They mentioned the priority tasks of the newly formed board like analysis and assessment of the situation in disasters, making decisions on providing rescue and emergency restoration work, informing the population about the development of the disaster, the actions taken to its master. Both experts confirmed that the LANDSLIDE project Model and Software would give assistance to the newly formed Regional Council and advised to look for financial tools in order to disseminate and transfer the Model and Software to the Municipality or to some other Regions.

As an interested party of the results of the project, the members of the Council are part of a cross-sector platform for information and communication. All of them will: receive the electronic newsletters issued under the project; be incorporated into ongoing prevention days, and will;

be able to participate in ongoing forums.

The interest was really big, because the landslide processes are one of the biggest problems of our area concerning the infrastructure and the real threats. That`s why our participation in LANDSLIDE project is very important for us and we are grateful to have the possibility to obtain the experience of our partners from Italy, Poland and Greece.



The LANDSLIDE Project Team Regional Administration Smolyan took a decision on 20th October 2016 to organise Cross-sector risk prevention platforms, dividing the representatives into different groups - NGOs, Civil Protection and the businesses. The event was attended by 20 people in each group. To every group **the Landslide Risk Assessment Model for disaster prevention and mitigation “LANDSLIDE”** project, was presented. This included also the activities, the objectives, the achieved and the expected results, as well the developed specific Software, whose main function is based on collected weather data and the amount of ground moisture to predict landslide. The Software is adapted for all test areas included in the project; one of them is the landslide in the area “Smolyan lakes”

During that event the Regional Council for reducing the disaster risk was formed, in order to improve coordination and interaction between organisations and institutions in the Region Smolyan.

The members of the council are the Regional Governor, mayors, members of Municipal Councils, the heads of the Fire department, of the Police, of the agency of “National Security”, and other people involved in the reduction and prevention of the disaster risk.



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LANDSLIDE Cross-sector Risk Prevention Platforms and Prevention Days

Marche Region

Marche Region is a territory widely subject to landslide phenomena. Many people live and work in areas very prone to landslides. Furthermore, there are many persons involved in the alert system and in the emergency activities, also related to the landslide damages.

Marche Region planned the cross-sector platforms thinking of the different people who live in areas very prone to landslides, as well as of those who work in the entire field of emergency (i.e. the different components of civil protection involved during an emergency).

Therefore, the staff in the Marche Region who are involved in the LANDSLIDE project identified, as eligible stakeholders, part of the regional department of civil protection, and students from Universities in the Marche region, directly concerned due to their university course.

So, the meetings among Civil Protection staff were adapted to the personnel employed in the above-mentioned fields, to inform them about landslide risks in the studied area, and to explain, starting from the important role of the weather forecast, the important support that the LANDSLIDE tool could give to local authorities in the monitoring activities during rainfall events or in the risk management field.

The meeting at the University was conducted in the framework of the course of Environmental Sciences and Civil Protection, and focused more on the geological aspects of the Landslide system; starting with a quick introduction focusing on the landslide risk in the Marche Region, then the LANDSLIDE project was presented. We illustrated the main characteristics of the software, what equations have been used, in which way the model has been calibrated, how much data and which kind of data it needs to work well; we have explained the flowchart of the model, from the acquisition of the data to the calculation of the soil moisture (that is the most important parameter that plays a fundamental role in the landslide activity). At the end we explained the maps, i.e. the outputs of the software, suggesting also in which way they could be used, e.g. in risk management, in the monitoring phase or in the research on climate change. Therefore, this meeting provided more specific explanation and showed students the different functionalities and opportunities of this tool. This was also done because forming young people could be fundamental to improve and increase technical knowledge, for a better approach, also in the future, to face and overcome this kind of phenomena.





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Final Conference of the Landslide project in Patras: 'Landslides; Risk Assessment: Engagement of Society'

LANDSLIDE project final conference was held in Patras city, Greece, November 10th and 11th 2016. Patras is the capital of Region of Western Greece, a region suffering from landslides on a permanent basis, being interested in any method that can provide feasible, transferrable solutions to the problem. The final conference was the biggest of a series of events that were organised in Greece to bring in the forefront of public dialogue the landslides problem, which is somehow neglected in comparison with forest fires and other risks, even though its impacts are important at economic and social levels.



Another DG Humanitarian Aid and Civil Protection project – RECALL- was invited to present their findings in the field of landslides prevention, with many presentations and full representation of its partnership. The aim was to seek complementarities and identify the next steps into landslides' preventive policies using cooperation of public authorities, research / academic institutes, NGOs and local communities.

The title of the conference was: "Landslides; Risk Assessment: Engagement of Society", indicative of the aims and synergies of both projects. 48 participants representing both projects, plus representatives of key players at regional and local levels. Secretary General of Region of Western Greece Mr. Katsifaras committed himself to finance findings of both projects that have an added value and can optimize fight against landslides.

The 2nd day partners visited the project pilot case of "Panagopoula" Landslide where major infrastructure works are undergoing to protect primary road and rail network from active landslide. Impressive tunnels and technical works of high standards are gaining benefits from projects such as LANDSLIDE.

Final conference underlined the need to merge efforts to create a coherent integrated framework for preventing landslides that will merge three pillars:

1. Scientific / Technical excellence
2. Operational (Civil Protection) Experience
3. Engagement of Society

LANDSLIDE project partners committed themselves to focus on building that framework the following years.



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Tools and project outputs

The LANDSLIDE project has produced a number of outcomes, tools and results, which can be retrieved from the official website:

www.landslideproject.eu

In particular a specific section of the Landslide website is dedicated to Landslide project outcomes and **TOOLS** and can be accessed from the LANDSLIDE website at the following address:

www.landslideproject.eu/index.php/tools

Landslide project outcomes and tools can be reached also through their own dedicated webpages. In particular, entering to the web-based LANDSLIDE system can be done also through the following addresses:

<http://93.123.110.111/landslide>

Landslide Hazard Assessment Model and Software. Here, the most important output layers that the users can see are depth maps and hazard maps which are computed on daily basis for every six hours and which produce the probability of land movement according to the water content in the soil. It is also possible to get the statistical analysis of the hazard maps and the off-line software for the generation of landslide hazard scenarios.

The Landslide **Training Platform** for training purposes in how to use the Landslide software is hosted in:

<http://elearning-landslides.net>

This platform is based on Moodle toolbox that allows dynamic and tailor made design, flexibility and ease of use. Three courses (training modules) have been created in all partner languages, using the developed training material and translation in partners languages where needed.

The **Practical Handbook** can be downloaded at the following address:

www.landslideproject.eu/index.php/tools

This Handbook is a guide for other territories in how to introduce and use the model and software in their respective risk mapping, assessment and prevention activities.

The **Tutorial web based** tool are Q&As posted to the help-desk, by the partners responsible for the pilot areas and for testing the Landslide software. The tutorial can be accessed at the following address:

www.landslideproject.eu/index.php/tools

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If you have any ideas or suggestions for the next edition, please let us know via:

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