Inventory for natural hazard events „StorMe“: experiences and further developments of the event documentation in Switzerland

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INTRODUCTION

After 20 years of experience with the documentation of natural hazard events, it is time for a résumé, but also for an outlook on further developments of the corresponding instrument for future requirements.

PURPOSE OF AN INVENTORY FOR NATURAL HAZARD EVENTS

Natural hazard assessment is essential regarding the integrated risk management of natural hazards. In Switzerland, the preparation of hazard maps is delegated to the Cantons since the early 1990s. The knowledge about past events („what has already happened?“) is important, besides modelling, expertises or interpretation of silent witnesses in the field (map of phenomena).

Past events are recorded in an inventory of natural hazards, which is by law also a cantonal duty. The cantons document for each event the date, the triggering factors, a description of the process, its dimension (affected area and intensity) and impact (damage). Knowledge about past events in an area is an important source of information for the hazard assessment and therefore a requirement for an integrated risk management. It helps to validate models or expertises, to determine potential endangered areas, to estimate the frequency of hazardous processes or to determine feasible scenarios. Furthermore, the information about past events and their processes are fundamental for the planning of protective measures and for emergency planning. Another benefit, which should not be underestimated, is given with respect to the risk dialog. The awareness of the public for hazardous situations declines generally fast after an event; they are out of memory already after a few years. A good documentation, especially by means of photos and maps, is often more convincing for hazard awareness than the opinion of experts.

RETROSPECTIVE VIEW

The federal authorities established the database application „StorMe“ in 1998.

The content and the standardized method of the data acquisition in the field were internationally broadly discussed during the project „DOMODIS“ (Documentation of Mountain Disasters). The field forms are nowadays used in a similar manner in different countries along the Alps.

Data collection in the field is carried out by cantonal staff (responsible for the field of natural hazard) or by employees of geoscience or hydraulic engineering companies. This was done either in a retrospective manner in relation to the elaboration of hazard maps by analysing archives or interviewing contemporary witnesses, or by the systematic documentation of recent events. The latter is advantageous due to the systematic approach. Depending on the Canton and mode of practice, substantial differences on the degree of detail with respect to the assessment are found.

Some Cantons have developed additional tools, which allow the illustration of the events on their cantonal geoportals (as an example of the Canton Ticino, see Fig. 1).

FURTHER DEVELOPMENT BASED ON PAST EXPERIENCES

20 years of experience with StorMe show that the inventory of natural hazards is used as an essential tool of the integrated risk management for the hazard assessment, project design of preventive measures, and emergency planning. Nevertheless, the existing application shows some deficiencies with respect to today‘s needs. Therefore, the structure of the content has currently been adapted, and a new database is being developed. Hence, the experiences of the past are used to improve the platform StorMe without losing existing advantages.

The basic structure has been appraised as being useful by all stakeholder groups. However, improvements are reached by abolishing certain attributes, which have hardly been used. Furthermore, events can be structured in future in a spatially differentiated way.

- As in the past the degree of detail of the event documentation was quite variable, the new concept will be better adaptable to the needs of the various stakeholders.
- The existing monetary information about damages during the field acquisition is usually speculative and can hardly be interpreted. This will therefore be abolished in StorMe, but each stakeholder must collect data about damages in its own field of activity.
- The existing database allows finding information on a local level. A harmonized overview over events or damages is only partly possible. In future and especially for large-scale events, particular single local events can be associated to so-called „combined events“. This allows finding all information about the total event and to easily access recordings, analyses and reports on a higher level.
- Today‘s technology will newly allow associating photos and documents with the events.
- The delineation and illustration of process areas and further observations as polygons, lines and points is important for the event documentation. Today, StorMe allows only setting one single point for an event. The new database will be a GIS-application and therefore overcome this deficiency.
- Being in line with the technical development, data recording in the field with mobile devices (such as tablets) is intended within the new application.
- So far, only the cantonal authorities could record natural events in StorMe. In future, also the Swiss federal railway company (SBB-CFF-FSS) and the Federal roads office (FEDRO) will use the same application; avalanche data of the Swiss Federal Institute for Forest, Snow and Landscape will be integrated as well.

OUTLOOK

The adaptation in the structure of the event documentation will further improve its benefit and further increase its acceptance and use. The new database will facilitate and intensify the collaboration and communication between the different stakeholders during and after events. The data will easier be accessible for all stakeholders involved in the risk management system (authorities, scientists, public), and the information can easier be evaluated due to the improved structure of the data. The new database with its adapted concept will therefore be a step forward to deal with natural hazards in the future.

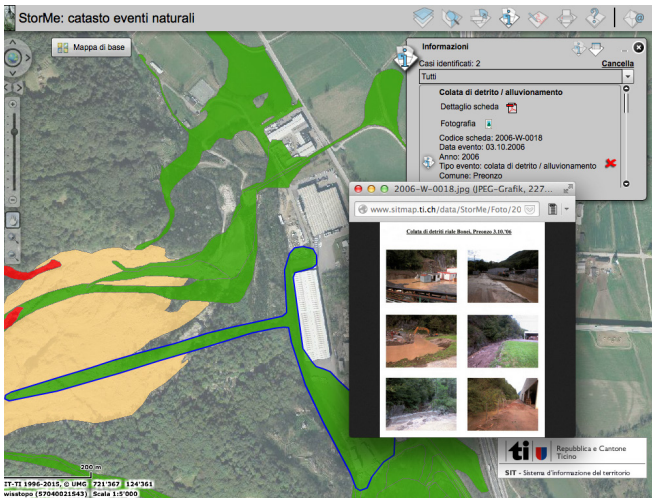

Figure 1. Example of the illustration of documented hazard events on the web geoportal of the Canton Ticino. Photos and full description of the event documentation can additionally be downloaded.

KEYWORDS

event documentation; inventory for natural hazard events; StorMe; hazard assessment

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