

Introduction or Preamble

Awareness and Education of European population: a key element for mitigation of natural risks

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SPECIFIC SUPPORT ACTIONS

NATURAL RISKS ASSESSMENT: HARMONISATION OF PROCEDURES, QUANTIFICATION AND INFORMATION

(SSA NaRAs)

In Europe, there is a strong concern about natural hazards as well as natural risks. As people may travel all around the world, awareness of population should be increased not only for natural risks in Europe but also for natural risks we may unlikely encounter in other areas.

As shown dramatically by the 26 December 2004 mega-event which has generated an exceptional tsunami, protection of the population depends on the reaction of each of us and, therefore, relies strongly on our education. Adequate behaviour in front of exceptional events should be undertaken by each of us at any moment without any help.

Earthquakes may happen in Europe, especially in area around the Mediterranean Alpin Arc from Portugal towards Greece. They may help us bring awareness by their regular occurrence if they are adequately observed.

Mitigation of these quite exceptional natural risks may go through prevention which is a necessary step for our society whatever are improvements in sophisticated warning or early warning systems. Once alert has been launched towards the population, before the arrival of well-trained rescue teams, we are on our own for very precious minutes in order to save our life and the life of others around us.

Better estimation of natural hazard and better monitoring of our natural environment as well as better management of territory are not enough. Information and education are two essential ingredients in any politics related to mitigation of natural hazards.

Creating and developing a seismological network around the world with an educative purpose has been a long-standing goal which has been supported by different funds often quite local ones related to local political concerns for young people education. One must underline an exception with the Specific Support Actions NaRAs of the European

Union. This programme has allowed the transformation of local actions into widespread initiatives and has permitted us concrete realisation as this document for precise training of young students.

Actually, the installation of seismometers in schools in different areas of Europe has given the necessary impulsion for students by a scientific approach for better development of activities around the hazard knowledge, the real time manipulation of information and scientific databases as well as the better understanding of related matters on risks and territory managements.

Therefore, by this long-standing education programme with the driving motivation of building a seismic network across different scholar communities in Europe, teaching Earth Sciences now integrates the difficult problematic of vulnerability in our urban society which becomes more and more dependent of any variation coming either from our natural environment or our industrial environment.

Best practices all around these European countries have been shared by teachers of different countries and various experiences have shown the richness of such sharing which has been performed during the NaRAs programme.

A long-term collect of different activities has been undertaken and finalized through this cookbook of proposed exercises with the help of the programme NaRAs. The SSA NaRAs has been the melting pot of teachers for sharing their experiences and for providing this book with combined exercises. The result is an already widespread cookbook which illustrates how it is possible, with the help of seismic data collected in schools, to tackle quite sophisticated scientific topics in a simple and pragmatic way during teaching and training.

The “sensors” topic is an essential step. Measurements through a sensor (for example of the ground motion with a universal time) could be explored from sensors of the seismic station or from sensors developed by students. Various aspects of the basic scientific background are tackled as the frequency, the bandwidth, the fidelity, the repeatability, the robustness related to the often linear oscillator behind the sensor.

The “data” topic is the necessary next step. The analysis of recorded signals leads to various investigations: work on waves which are a key notion in our society as radio, TV, internet are using them intensively. Travel times, wave speed, localization through triangulation are typical features one student can easily master without going into sophisticated mathematical tools.

The “tectonic” topic is as well very rich in various activities. Numerous kits have been proposed and realized by students. These practical exercises will introduce abstract notion as seismic cycle, stress building, friction phenomena and energy release among others.

The “Earth” topic is obviously a central point for Natural Sciences teaching with the possibility of geographical mapping through the presentation of data collected among

schools, the discussion of the seismic hazard either at the global scale or at the local scale, the presentation of different seismic signatures as Benioff planes or Moho discontinuity. Finally, these activities illustrate how we know the internal structure of the Earth.

The “risk” or “hazard” topic comes naturally after these different speculations or analysis. From seismic records, students will illustrate through practical constructions the notion of intensity, the building resonance, the parasismic rules of constructions and the induced effects of a tsunami on coastal zones. With many national initiatives, this topic will increase more and more its importance during educational trainings.

All these examples of simple activities, which could be worked out by students, have been collected and brought in this single cookbook, thanks to the SSA NaRAs programme. This collaborative work which has started ten years ago could illustrate the conjugated efforts of researchers and teachers for a better education and awareness of the risk culture especially in young populations.