Disaster Reduction and Enhancing Education for Sustainable Development
Priority area

in the

Hyogo framework for action, 2005-2015

(outcome of Kobe Conference)

Knowledge, innovation and education -
Building a culture of resilient communities
IIIrd Summit:

Ministers adopted

the Plan for the creation of a
Global Earth Observation
System of Systems (GEOSS)
over the period of 2005-2015,
and identify the necessary
human, budgetary, scientific
and technological resources
for the implementation of
GEOSS.

17 February 2005, Brussels
“Education - in all its forms and at all levels - is not only an end in itself but is also one of the most powerful instruments we have for bringing about the changes required to achieve sustainable development.”

Koïchiro Matsuura,
Director-General of UNESCO
« The best defense against disaster is a well informed community »

Franklin Mc Donald, Director Natural Resources Conservation Authority, Government of Jamaica
3 pillars of Sustainable Development valid for disaster reduction

- Social perspectives
- Environmental perspectives
- Economic perspectives

With culture as an underlying dimension
Education for disaster reduction

to accelerate the progress of societies toward disaster resilience

A process in which individuals gain awareness of their environment and acquire knowledge, skills, values, experiences, and also the determination, which will enable them to act - individually and collectively - to cope with disasters.
Education for disaster reduction

Objectives

**Knowledge** - to help individuals, groups and societies gain a variety of experiences in, and a basic understanding of, the knowledge and action competencies required for disaster reduction
UNESCO Developed Disaster Reduction Programmes on Geological Water Ocean Related Hazards
1980
El-Asnam Algeria
10 October, 13:24, 15 Km east of El-Asnam, Ms=7.3; focal depth = 10 Km

3000 people killed, 8500 injured, 480,000 homeless
30,000 housing units destroyed, 60,000 damaged
Economic losses: more than US$4 billion
Archeological sites damaged
1983

Arab Fund for Economic and Social Development
Islamic Development Bank
UNESCO

Algeria
Egypt
Irak
Jordan
Lebanon

Libya
Morocco
Syria
Tunisia
Sudan
1984-2005

UNESCO implements the training and technical assistance components of the PAMERAR projects in Tunisia, Morocco, Syria
PAMERAR results

**Capacity building for earthquake risk reduction**
more than 3500 person-days of training provided for scientists, engineers and technicians, more than 40 missions of technical assistance organized

**Development of seismic networks**
300 seismometers and accelerometers installed in Morocco, Tunisia, Iraq, Yemen, Jordan, Syria and Egypt

**Earthquake provisions to building codes**
in Algeria, Jordan, Morocco and Tunisia
Continuing learning, international exchanges

UNESCO Programme - Reducing Earthquake Losses in the Eastern Mediterranean Region

ALGERIA, CYPRUS, EGYPT, GREECE, ISRAEL, IRAN, JORDAN, LEBANON, LIBYA, WEST BANK AND GAZA STRIP, MOROCCO, OMAN, SAUDI ARABIA, SYRIA, TUNISIA, TURKEY, YEMEN

more than 20 International Workshops to improve and share seismic data for the adoption of policies and actions of sound planning land-use and construction techniques
Earthquakes

REINFORCEMENT OF INFORMATION ANALYSIS AND PROCESSING CAPACITY FOR NATURAL RISK REDUCTION AT THE MUNICIPALITY LEVEL USING GEOGRAPHICAL INFORMATION SYSTEMS TOOLS, MUNICIPALITY OF CANAS, COSTA RICA.

Seismic Risk map of the city of Canas (in case of earthquake of VIII MM intensity)
"GEOGRAPHICAL INFORMATION SYSTEM (GIS) DEVELOPMENT FOR NATURAL DISASTER AWARENESS AND PREPAREDNESS FOR EMERGENCIES"

Distribution of 1 floor, 2 floors, 3 floors and more than 3 floors buildings, Tegucigalpa.
RAP-CA / Guatemala
Volcanic eruptions
Pyroclastic flows
Flash floods

« ZONIFICACIÓN DE AMENAZAS NATURALES EN LA CUENCA DEL RÍO SAMALÁ Y ANÁLISIS DE VULNERABILIDAD Y RIESGO EN LA POBLACIÓN DE SAN SEBASTIÁN RETALHULEU. »

Vulnerability map of San Sebastián Retalhuleu

Pyroclastic flows, 1983
Natural Disaster Reduction
an interdisciplinary approach

DISSEMINATION OF INFORMATION

TRAINING MATERIALS

• Training Manual on Volcanic Disaster Reduction, 1998
  This manual aims at providing professionals who are mainly involved in national civil
defense, urban and countryside development, with the necessary background on volcanic
disaster mitigation. This material is a joint effort and collaboration of UNESCO and the
  Philippine Institute of Volcanology and Seismology (PHIVOLCS).

• Training materials for disaster reduction, 1995. Four multidisciplinary training
  modules address two natural hazards: earthquakes and floods. These modules, which are
  meant for professionals in the civil service and staff of non-governmental organizations, are
  tools which trainers can select from and combine parts of special interest in an unlimited
  way. This project has been funded by the governments of the Netherlands, Denmark and
  Belgium.
SPACE EDUCATION PROGRAMME (SEP)

Space as an educational and research tool: an innovative approach to science education

Enhance space subjects and disciplines in schools and universities, particularly in developing countries

Partners: space agencies, space industries, space-related IGOs, NGOs and associations
UNESCO Programmes

**Science**
- IGCP, GARS, International Charter on Space and Major Disasters
- Modelling, monitoring, forecasting, and early warning systems

**Education**
- Space Education Programme, Commissions, books and guides

**Cultural**
- Expert Missions, Convention, UNESCO/ESA Open Initiative

**Culture of prevention**
- Better informed public

**Protected world heritage**
• Context, scope and strategic objectives
• Beneficiaires, stakeholders and user needs
• Required observations and key systems
• Integration issues
• Filling the gaps
• Implementation plan and commitments to act
Most required observations
Four common observational requirements

**Baseline Topography**
- Baseline against which to measure change
- Modelling of gravity process, visualisation

- **Baseline Mapping**
  - Geology, structure, soils, faults, fractures
  - Regional to local scales

- **Deformation Monitoring**
  - Sudden change (catastrophic events)
  - Gradual (on going processes, precursors)

- **Seismic Monitoring**
  - Seismic magnitude
  - Depth and location in the subsurface
Gap analysis

- **Existing Observations**
  - e.g. No global high resolution topographic dataset

- **Key Observation systems**
  - e.g. lack of continuity of L and C band INSAR

- **Data Management**
  - e.g. Too few archives are visible and fit for purpose

- **Integration and Modelling**
  - e.g. In-situ and EO integration happens rarely

- **Building the Geohazards Community**
  - e.g. No global mechanism to implement strategy

- **Science Research Agenda**
  - e.g. Models, knowledge not yet adequate for prediction
Filling gaps: GEO-GEOSS Process

✓ Disasters are one of the selected topics…
✓ IGOS Geohazard Theme one of the inputs…
✓ Topic Coordinator a member of Theme Team

Can GEO fill some critical gaps in:

– Political Support?
– Structures?
– Funding? …to make it all a reality
Co-event deformation mapped by ERS (C-band, $\lambda = 5.66$ cm) InSAR
Co-event deformation mapped by JERS (L-band, $\lambda = 23.53$ cm) InSAR
Infinite Possibilities

Hazards understood & mapped…

…monitored in space & on the ground.

The right buildings in the right places!

Early warnings & rapid response:

information made available to all
Global Realities

Hazards understood & mapped…

*Hazard knowledge and mapping incomplete*

…monitored in space & on the ground.

*Examples of best practice in developed world*

The right buildings in the right places!

*Some buildings, some hazards, some places*

Early warnings & rapid response:

*Warnings only for certain hazards*

information made available to all

*Inconsistency & the digital divide*