ITALY: *PIEMONTE REGION METEO-HYDROLOGICAL ALERT AND THE REAL-TIME FLOOD FORECASTING SYSTEM*

1. Location of the study:

Piemont Region in northwestern Italy covering 25, 000km^2 situated from 6° 40'E to 9° 15'E and 44°N and 46°N. The region is predominantly alpine and is situated on the Padana plain surrounded on three sides by mountain ranges that make up 75% of the region's territory.

2. Author(s): D. Rabufetti and Secondo Barbero[1]

3. Brief description of flood management practice

Flood management practice in the Piemont Region is highly influenced by its topography and its land use pattern. Flash floods and high mass transport occur on the steep streams falling down from the Alps into the Padana plain. In the lowlands, rapid and unpredictable flooding occurs on the Po, Tanaro, Dora Baltea and Sesia rivers due to the rapid flooding of their tributaries.

Forests cover the mountainous area. The lowlands are primarily used for agriculture. The most populated and highly industrialized zones are located in the major river valleys. These zones are highly vulnerable to flooding and flood damage is potentially very high given the concentration of infrastructure in the area.

Given the natural landscape and land-use patterns, structural and non-structural measures have evolved to mitigate flood damage. The main objective of flood management in the Region is to limit human loss.

Structural measures including levees have been constructed in the lowlands along the major rivers to mitigate the effects of major floods, and weirs on the mountain streams to mitigate erosion and bed load transport. The major non-structural measure is the evolution of an Alert System using hydrometeorological forecasts for civil protection purposes. The Alert System is a real-time measure for flood forecasting and warning.

4. Key issues

- The importance of a good warning system in the face of flash floods generated by heavy storms localized on mountain catchments
- Benefits of cross sectoral collaboration in formulating a comprehensive alert system
- Critical need for the exchange of information between sectors - particularly between private and state sector power and water management institutions
- Exchange of information and observation data from neighboring countries for effective forecasts

[1] Piemont Region's Technical Service for Prevention

5. Relevance to the concept of IFM

The study covers the following aspects of IFM to varying extents:

Integration of land and water management

Aspect 2 - Land and water management
Aspect 3 - Laws and regulations for flood and water mgmt

Best mix of strategies

Aspect 10 - Best mix of structural and non-structural measures

Participatory approach

Aspect 5 - Stakeholder involvement in decision-making
Aspect 7 - Community-based approach
Aspect 9 – Effective linkage between existing institutions

Integrated hazards impact mitigation

Aspect 1 - Cross-sectoral integration of disaster management strategies
Flood plain maps and zoning
Early warnings and forecasts
Aspect 8 - Tools to support decision-making
Aspect 11 - Free and open exchange of data

6. Comments

(i) Potential strong points of the case study

- Good structure for the flow of information from the data processing to warning of civil defence
- Well functioning international cooperation for the exchange of data
- The hazard maps developed to establish the interaction between human activities, river and hill slope dynamics, of the risk scenario identification

(ii) Potential for practices mentioned to be transferred/applied to other regions with geophysical and socio-economic characteristics)

The alert system can be replicated in regions experiencing a high incidence of flash floods. However, the success of the system would depend on the extent to which necessary observation data can be obtained, the capacity of information technology systems and communications systems available, and the extent of cross sectoral integration prevalent in a given location.