

### The Hydro-Geological Management Plans (P.A.I.) in the Veneto Region – Planning and Management of Hydraulic Risk in Urban Areas

#### BACKGROUND

Hydraulic protection is the preliminary and essential basis for a sustainable development without which water will always represent a serious menace to populations and economics.

#### PROBLEMS

- Need to preserve the urban areas and populations from natural risks and from emergencies
- Necessity to encourage a deeper consciousness on the topics of natural risk and a correct use of the land, in order to enhance the receptiveness and ability to communicate and cooperate between subjects and institutions



Source: [www.provincia.vicenza.it/img/leogra3.gif](http://www.provincia.vicenza.it/img/leogra3.gif)

- Need to prepare a qualified staff with the strategic capacity of tackling risky conditions

#### SOLUTIONS

The Veneto Region experienced an instrument, aimed at predicting risky situations, starting off disaster prevention actions and encouraging an emergency management culture, which can bring about efficient risk management policies.

This instrument is structured in 4 different levels:

1. The first level, through the P.A.I. (Hydro-Geological Management Plans), provides for the identification and delimitation of the areas subject to hazardous hydraulic conditions by means of a mathematical model that can: (i) simulate flood propagation; (ii) determine where these are likely to overflow due to inadequate river beds; and (iii) assess the resulting effects on the surrounding areas. The subsequent preventive action takes shape into regulations which set different limits to building sustainability according to the flood extent.
2. The second level, at a local scale, gives prominence to local hazardous conditions and checks whether urban development decisions and plans are appropriate. Each development action must be complemented by a study, assessing how the new development provisions can interfere with the existing hydraulic conditions and evaluating whether they can cause variations of the hydrological regime.

3. The third level aims at identifying effectual solutions for flood preventions, even in a deeply urbanized environment.
4. The fourth and last level tackles risk protection through an emergency management and alert system, which requires the involvement of the different concerned subjects and actors.



The Veneto Region. Source: [www.visititalia.it](http://www.visititalia.it)

The P.A.I. preliminary activities are organized in three subsequent stages:

- In the first stage, all available information on hydro-geologic conditions is collected.
- In the second stage, hazardous areas are delimited by means of a bi-dimensional model and the necessary protection measures are determined.
- The last stage involves the scheduling of risk mitigations actions.

Thus, a series of cognitive, working and activity plans for emergency management are outlined.

To have a practical example of application, see the Best Practice concerning Vicenza's metropolitan area.

## BENEFITS

The experience was founded on the participation, at various institutional levels, in a hydraulic risk prevention and forecasting action. The P.A.I. consists in the realization of risk maps and of regulations governing hazardous areas.

Implementation rules represent an effective land protection and preservation instrument, since they allow to prevent risk intensification, through land use prescriptions and development models, which are compatible with the rivers' hydrological regime.

Thanks to the risk maps local communities can establish the areas affected with flood risk and decide priority actions.

At a local level, the indications provided by the P.A.I. are helpful for the definition of development plans that take into account the site capability to receive the new building, considering how these can interfere with the existing difficult hydraulic conditions and the possible alterations which can affect the hydrological regime.

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