



## **Risk Perception Analysis Related To Existing Dams In Italy**

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In the first part of this work, the progress of Italian National Rules about dams design, construction and operation are presented to highlight the strong connection existing between the promulgation of new decrees, as a consequence of a dam accidents, and the necessity to prevent further loss of lives and goods downstream.

Following the Gleno Dam failure (1923), a special Ministerial Committee wrote out the first Regulations and made the proposal to establish, within the High Council of Public Works, a special department that become soon the "Dam Service", with the tasks of control and supervision about construction and operation phases of the dams and their reservoirs.

A different definition of tasks and the structure of Dam Service were provided in accordance with law n° 183/1989, which transferred all the technical services to the Office of the Prime Minister; the aim was to join the Dam Office with the Department for National Technical Services, with the objective of increasing the knowledge of the territory and promoting the study on flood propagation downstream in case of operations on bottom outlet or hypothetical dam-break.

In fact, population living downstream is not ready to accept any amount of risk because has not a good knowledge of the efforts of experts involved in dam safety, both from the operators and from the safety Authority.

So it's important to optimize all the activities usually performed in a dam safety program and improve the emergency planning as a response to people's primary needs and feeling about safety from Civil Protection Authority.

In the second part of the work, a definition of risk is provided as the relationship existing between probability of occurrence and loss, setting out the range within to plan for prevention (risk mitigation), thanks to the qualitative assessment of the minimum safety level that is suited to assign funds to plan for Civil Protection (loss mitigation).

The basic meaning of the reliability of a zoned earthfill dam is illustrated by defining the risk analysis during its construction and operation. A qualitative "Event Tree Analysis" makes clear with an example the probability of occurrence of the events triggered by an earthquake, and leads to a classification of the damage level.

Finally, a System Dynamics (SD) approach is presented to investigate possibilities of a preventive planning in relationship to the risk, so that it's possible to establish shared procedures to achieve the correct management in any crisis phase.

As a qualitative result of a SD application, figure 1 presents a flow-chart about a case study on the same dam so to illustrate the emergency planning in a step by step procedure according to the Regulations.