Editorial by **Michele Mossa**

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Floods in Pakistan and around the world. What can we expect in the future?

Five years ago my home city of Bari (Italy) and its neighbouring towns were hit by a serious flood. Five people were killed in an embankment collapse on a road, another victim was swept away in his car, and the severe weather also caused two railway accidents and 22 passengers were injured. Material damage resulted in major road collapses, damage to agricultural crops, and to electrical networks. On the occasion of that flood the previous Editor of the Journal of Hydraulic Research, Prof. Marcelo Garcia, invited me to write a forensic article on the history of floods in Bari highlighting the last one of 2005. The main aims of that article were to point out essentially the historical and technical aspects and the errors, which have unfortunately been repeated in the anthropogenic action in the territory, sometimes in spite of the preceding tragic events that should have taught us better.

With a sort of bottom-up procedure, using the analyzed case study, I think that the paper contains many warnings of general character and its conclusions might be applied to floods in other parts of the world. Video clips and photos of the 2005 Bari flood are freely available on the IAHR Media Library, the IAHR web resource of multimedia material (www.iahrmedialibrary.net). Those images and video clips prove the severity of the facts and, above all, some repeated engineering errors.

One of the last devastating floods in the world, which unfortunately hit a much larger area and was far heavier than the previously mentioned, occurred in Pakistan. This flood began in July 2010 following heavy monsoon rains in the Khyber Pakhtunkhwa, Sindh, Punjab and Balochistan regions. On 20 September the official number of deaths was put at 1,752, the damaged homes 1.8 million and 12% of the 166 million population and 20% of the land area were affected.

It is well known that the extreme consequences of floods can be attributed to extreme and intense precipitation, geological, morphological, and hydro-geological conditions of the ground upstream of the inhabited areas. But we also know, even if at times we might forget, that our planet is “alive”. Therefore, we must always consider that the risks of floods, hurricanes, earthquakes are not evil spells of dark gods craving sacrifices, but phenomena of a living planet. Nevertheless, we should also consider the possibility that the number of these phenomena have increased over recent decades and that human activity could be in some way responsible of this increase. Furthermore, these catastrophes could also be due to the necessity to inhabit larger areas of our planet. In fact, sometimes these areas, which are characterized by many territorial risks, attract settlements, since they could be particularly prosperous (such as, for example, the ground around volcanoes, which is generally very fertile).

In this issue, Hydrolink looks at the causes and consequences of the flooding of the Indus river in Pakistan. As previously noted, one of the questions is what the main cause of the intense rainfall was. Was it the weather, or climate change? According to meteorologists an unusual jet stream in the upper atmosphere from the north intensified rainfall in an area that was already in the midst of the summer monsoon. In the case of Pakistan, could the high population growth rate have contributed to a rapid deterioration of the country’s natural environment? If so, does this include extensive deforestation and the building of dams for irrigation and power generation across tributaries of the Indus river? Could it be that years of political unrest have also left their mark with the result of further extra danger? How can Pakistan better prepare for floods? How will have also climate change affect the region in the future?

The Hydraulic community should also debate if human activity unsupported by correct hydraulic constructions exacerbated the flooding, or if a higher level of attention should have be given to better protect the territory in order to avoid high risk situations. Furthermore, it is important to highlight that, once hydraulic constructions have been realized, they must be successively maintained in order to continue their efficiency with a correct territorial planning.
All these questions and themes are partly handled in this issue with the article by prof. M. Hanif Chaudhry (Mr. & Mrs. Irwin B. Kahn Professor, Associate Dean, College of Engineering and Computing, University of South Carolina) and in prof. Ana Maria Da Silva’s interview (Department of Civil Engineering, Queen’s University, Kingston, Canada) with Dr. Daniel Kull (Senior Officer, Disaster Risk Reduction, International Federation of Red Cross and Red Crescent Societies (IFRC).