



Urban Resilience to severe storms. An Italian case-history of local community response to natural disasters.

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Tyrrhenian Liguria, a region in north-west Italy, is characterised by complex orography, storms, heavy rainfall (due to orographic lift) and flash floods. The subsequent flooding problem impacts the heavily urbanized coastal zone that resides at the exit of any inundated catchment. Heaviest rain occurs in early autumn, when tropical-storm-type convective cells develop due to the high sea surface temperatures experienced offshore of this region. The resulting storms can discharge more up to 500-600 mm of rain in 24h, at rates of up to 100 mm/h. Locally, annual rainfall of up to 2000 mm are typically recorded for the 200 km length of coast between Savona and La Spezia. Across this region as much as 948 mm of rain have been recorded in 24h, as during the 7-8 October 1970 event (this being the highest rainfall ever recorded in Italy, and is the second most extreme rainfall event recorded in Europe).

Beginning at 07:00 on 4 October 2010, the municipality of Varazze (which hosts 14 000 inhabitants over 47 km²) was hit by extraordinarily heavy rainfall. The storm had a peak rate of 30 mm/15min and 96 mm/h, to caused 300 mm of rainfall in 6h. The resulting flash flood and debris flows inundated the coastal plain to cause extensive damage and problems for the local residents. However, during this event, the weather forecast agency failed; alert status remained at lower levels, and regional authorities were incapable of supporting technical and information needs. On the other hand the local community responded immediately, providing people for digging and pumping, cooking up meals for civil protection volunteers, housing for evacuated families, and funding for initial needs of damaged residents.

Although there was no loss of life, material and economic damages were high. While damage to public infrastructures (streets, bridges, sewage, electricity and gas lines) was reported to be more than 15 M€ private and commercial claims for restoration expenses were more than 10 M€ further 10 M€ is required for risk reduction, and the Italian government has contributed 3 M€ to this, with local funding for the first relief efforts being about 1 M€.

According to IPCC, climate change is leading to more concentrated rainfalls, higher sea surface temperatures and sea-level rise. These three effects will lead to higher hazards along the Ligurian coastline and other Mediterranean regions. Disaster risk reduction (DRR) is hampered by poor funding, lack of areas for re-location of displaced populations and new building pressure. The only alternative is thus to raise the resilience of the local population.

This recent event highlighted the characteristics and mentality of small Italian town populations that contribute to resilience. Strong family ties, wide neighbourhood relationships, and substantial civil protection volunteer groups permitted Varazze's population to face the disaster and to (mostly) recover their normal way-of-life within 48 hours. Local television and radios had special importance, allowing rescuers and people in danger to be connected, facilitating official communications and informing the population to allow situational awareness.

This paper uses the Varazze experience to discuss a community-based disaster risk reduction strategy. This strategy comprises preparedness; covering holes left by planning mistakes, misunderstanding of first relief issues and poor recovery projections. It also outlines best practices for improving resilience in local communities, across which web 2.0 tools can enhance information strategies and emergency management. Finally we ask whether this is a strategy appropriate for European countries only, or is it suitable to non-European countries?