

Drowning mitigation in swift water situation at Parana State, Brazil

Mr Icaro Greinert¹, Ms Virginia Turra¹

¹Parana State Fire Department, Curitiba, Brazil

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According to the intergovernmental climate change panel, the world temperature will increase up to two-Celsius degrees in one hundred years. The higher global temperature probably going to cause extreme weather scenarios like flash floods. Urban growing and soil impermeabilization are others important factors associated to the swift water phenomenon, as inordinate city growing too. All of those scenarios facility the human susceptibility to the natural disasters. Parana shore, South Brazil, is too much susceptible to flash floods according different factors: there are a lot of mountains and rivers in the area and a high-standardized precipitation index. A research realized at the local fire department data base between 2005 January until 2015 March, have shown that third one (31) people died from drowning in swift water situations (floods or not) in Parana shore rivers. The average is three persons each year, almost all of them in the same town, Morretes.

For a long time, in Parana shore, there was not countermeasures systems like: monitoring, alert and alarm system to predict flash floods. In 2011, a big disaster happened in the area, when landslides and floods hit the local population, while the authorities and community were not completely prepared for that. As a result, studies and researches were realized and many disaster mitigation improvements started:

- 1) The Parana Civilian Defence partnership with Estate Meteorological Institute developed a precipitation and hydrological monitoring system. Currently, in the state shore, there are twenty seven (27) monitoring stations, providing real time information;
- 2) Also, the Parana Civilian Defence created the web tool On Line Contingency Plan; the municipalities are able to insert all of disaster relevant issues and possibly answers in these plan;
- 3) Three: The cities strengthened their local Civilian Defence by low;
- 4) Four: All of flash food susceptible areas were indexed on contingency plan.

The Parana shore fire department is the regional civilian defence agency and for this reason, implemented important actions to drowning flood mitigation:

- Swift water technical equipment's were acquired;
- Half of personal had specific swift water training;
- A flood alert and alarm protocol was created;
- Flash floods risk areas are signalized.

All of these actions certainly keep contributing to flood drowning mitigation in Parana Shore. However, the present scientific article identified some good practical to decrease flood drowning like:

- Community education and sensitization improvement;
- More public information about the flash floods risks;
- And Community risk areas training.

Finally this article, bring some relevant information about floods drowning. For many years, the local authorities and population only carry about ocean drowning, now we propose a new point of view about flood and flash floods drowning, over view the mitigation.