



PROGRESS REPORT ON THE DETAILED GEOHAZARD MAPPING OF TALOMO AND MATINA-PANGI WATERSHED AREAS, DAVAO CITY

Salvio B. Laserna and Raymundo I. Villones Jr.***
Lands Geological Survey Division
Mines and Geosciences Bureau – Central Office

ABSTRACT

The Matina-Pangi and Talomo Rivers in Davao City, Mindanao Island have experienced extreme flooding events with disastrous consequences in June 28 to 29, 2011 and June 2009, respectively, thus making them “killer rivers” in Region XI. In particular, the flashflood event that devastated the residential areas at the downstream portions of Matina-Pangi River in Bgy. Matina-Pangi, Davao City (causing 30 deaths and properties worth millions of pesos destroyed) was a rare occurrence since its catchment area was small compared to other flashflood prone rivers in Davao City, such as Talomo and Davao Rivers. As part of the National Geohazard Mapping and Assessment Program (1:10,000-scale) of MGB-DENR, the watershed areas of the Matina-Pangi and Talomo Rivers were thus subjected to detailed geohazard assessment in terms of flooding and landslide.

Based on the geohazard survey, the extreme flash-flooding during June 28-29, 2011 heavy rainfall event at the Matina-Pangi watershed area was aggravated by several factors, but mainly due to the artificial damming of floodwaters and debris at the constricted channel wherein the abutments and bridge structure of Pangi Bridge are sited. The eventual destruction of the Pangi Bridge caused the temporarily dammed floodwaters to rush downstream along the main river channel and along the upper banks due to backflow and diversion of the flow, inundating roadways, subdivisions, townhouses and other structures. The conditions of this extreme flooding event are considered to be similar to the previous flash-flooding at Talomo River in June 2009.

* *Supervising Science Research Specialist*

** *Senior Science Research Specialist*



The areas affected by the recent flash-floods in the Matina-Pangi River and Talomo River were classified by MGB – XI as moderate and moderate to highly-susceptible to flooding, respectively.

The major factor that triggered the disastrous floods within the Matina-Pangi River and Talomo River watersheds is the excessive levels of precipitation from rains of high intensity for a short duration (“cloudburst”), or long duration.

The other factors determined in the geohazard study that make the said watershed areas very prone to flash-flooding are the high drainage density, high relief and ruggedness, thin soils in the headwaters, increasing degree of urbanization, decreasing vegetation cover and natural restriction of river flow due to sedimentation/siltation and river-tidal convergence of the mouths of both the Matina-Pangi and Talomo Rivers that exit along Davao Gulf.

With respect to landslide geohazards, the Matina Hills Shrine sloping ground and vertical faces of the Alonzo Quarry in Bgy. Matina-Pangi, and the hills and ridges in Bgy. Langub were delineated to be susceptible to critical. Examples of critical areas occur along the Diversion Road wherein cut-slopes with evidences of sliding are unfortunately also inhabited by informal dwellers. In the Talomo River watershed area, some portions along the abandoned river banks of the river located east of PRC Village and in the Davao Greenheights Subdivision in Mintal have moderate to high landslide susceptibility due to the steepness of the slope.

The following are recommended to help mitigate or avoid a repeat of the extreme flooding events in both the Matina-Pangi and Talomo Rivers, and to avoid impacts of landslides in the watershed areas:

- The local government officials should be strict in the implementation of their land use plan. Residential areas should not be located or established within flood prone areas especially along abandoned river channel or inside the curve of a meandering river channel;
- The provisions of the DENR regarding the buffer zone or easment of five (5) meters on both sides of the river bank should be implemented. There should be no construction of houses along this zone;



- The detailed geohazard map produced by MGB should be used as a reference by the city government in land use zoning to identify possible relocation areas, in the site selection of a community and prior to the construction of subdivisions. Areas with low to moderate susceptibility to landslide and flooding are recommended for community development but should be supported by slope stability measures and appropriate drainages;
- The city government of Davao should conduct dredging at the mouth of Matina-Pangi River to prevent the development of sand bars that blocks the flow of water coming from Matina-Pangi River;
- The mouth of Talomo River should be re-channeled to its former location near Shimric to prevent flooding in the Bangkal area;
- All types of development at the headwaters of both watersheds should be subjected to detailed environmental impact study with respect to the hazards of flooding and landslides;
- An intensive information drive on geologic hazards particularly mass wasting should be conducted to advice the residents living along the footslope of Matina Shrine Hills on the landslide vulnerability and risks of living in their area;
- Balusong Bridge should be reconstructed to a much higher level like the one constructed at the Diversion Road where Matina-Pangi River flows. The bridge being constructed at lower elevation and narrow spaced concrete post have constricted the river channel making it prone to debris damming;
- The MGB Region XI and the City Environment Office should imposed the construction of siltation ponds in the quarry areas to prevent siltation from going into Matina-Pangi River. Benching and other slope-stabilization measures should be done along any vertical quarry face to prevent landsliding.
- Rain gauges should be installed at the upper watershed of both rivers to forewarn residents living below whenever unusually higher precipitation is observed. A warning system should be set-up so that upstream communities of the river can immediately warn communities downstream regarding the presence of dammed river channel that could result to flash-flooding;
- Monitoring of landslide prone areas should be done to warn residents regarding the development of tension cracks and other landslide manifestation.