

## Description of the Problem

During the period 25-31 October 1998, 565.5 mm (22.3 inches) of rainfall fell at the town of Tela, located on the north coast of the Country. The heavy rainfall caused widespread flooding throughout the Sula Valley. In the Choloma area, levees constructed by the Sula Valley commission overtopped and breached in several locations along the Rio Chamelecon resulting in high velocity flows and destruction of housing. Landslides were not a major factor in Choloma.

## Landslides

Landslides were not an issue at Choloma due to its location in the alluvial plain of the Sula Valley.

## Flooding

Flooding at Choloma was part of the overall flooding, which occurred throughout the Sula Valley. The Sula Valley lies at the confluence of the largest rivers in Honduras including the Rio Chamelecon with a drainage area of 4,250 square kilometers (1,639 square miles) and the Rio Ulua with a drainage area of 21,700 square kilometers (8,368 square miles). These drainage basins receive over 1600 mm (60 inches) of rainfall per year. Due to the large drainage into the valley, and the flat, alluvial nature of the Sula, most of the Valley is susceptible to frequent, widespread flooding. Additionally, at Choloma, the Choloma River enters the Sula Valley from the west providing an additional source for flood flows.

## Mitigation Measures

- *(Short Term)* It is recommended that the levees that were breached in the area of Choloma be repaired as soon as possible, preferably prior to the next rainy season.
- *(Short Term)* Both levee breaches we observed were at locations where small communities were present. Because a levee breach is a violent occurrence, characterized by high velocity flow and extreme sediment movement, the potential for death and destruction is greatest in the area immediately adjacent to the breach. For this reason, the levee should be re-built such that the height and strength of the levee is strongest at those locations where communities are located immediately adjacent on the interior side. It appeared that at Choloma, the levees were the lowest and weakest at the locations where the communities were located.
- *(Long Term)* Due to the large size, and economic importance to Honduras of the Sula Valley, it is recommended that any proposed Civil Works for Choloma be a part of an overall flood control plan for the entire Sula Valley. This plan may contain provisions for upstream dams and reservoirs to store flood waters and sediment, a system of levees to protect key locations, and channels and floodways to efficiently pass flow, to name a few. This problem is so large as to require a long-term, comprehensive approach to mitigating the impacts of flooding within the valley.
- *(Intermediate Term)* Most structures in the Choloma area, and particularly those areas closest to the Rio Chamelecon, are constructed on the natural grade of the land. Since this entire area



is in the floodplain and subject to periodic and frequent inundation, it is recommended that new construction be elevated 1-2 meters above the floodplain. This will greatly mitigate the loss of property and life when the inevitable flooding occurs.

## Evaluation of Proposed Housing Sites

No housing sites were proposed or evaluated at Choloma.

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## El Progreso

### General

El Progreso is in the Yoro District and the municipality is located at the confluence of the Rio Pello and the larger Rio Ulua. The Rio Pello and the Rio Corocol run through town, but the Rio Corocol does not converge with a larger channel. Instead, it empties into a low gradient area within the town limits. The Rio Pello watershed area is approximately 20km<sup>2</sup>, and the headwaters of the Rio Pello provide approximately 60% of the city's potable water; the remaining 40% comes from water wells. Flooding associated with the Rio Pello caused spatially variable erosion and deposition that damaged or destroyed hundreds of homes. Relocation sites for the displaced residents were

limited by the extensive private land holdings surrounding the municipality.

### Description of Problem

The Rio Pello, and the much smaller Rio Corocol produced flooding in the municipality. The Rio Corocol caused shallow flooding (<0.30 meters) but did not cause extensive damage. On the

other hand, the Rio Pello widened its channel by as much as 200 meters, and it produced up to 3.5 meters of bed aggradation. Sedimentation and the fate of sediment are the immediate issues that need to be addressed here. Local engineers estimate the sediment accumulated in the river basin at 250,000 m<sup>3</sup>.

