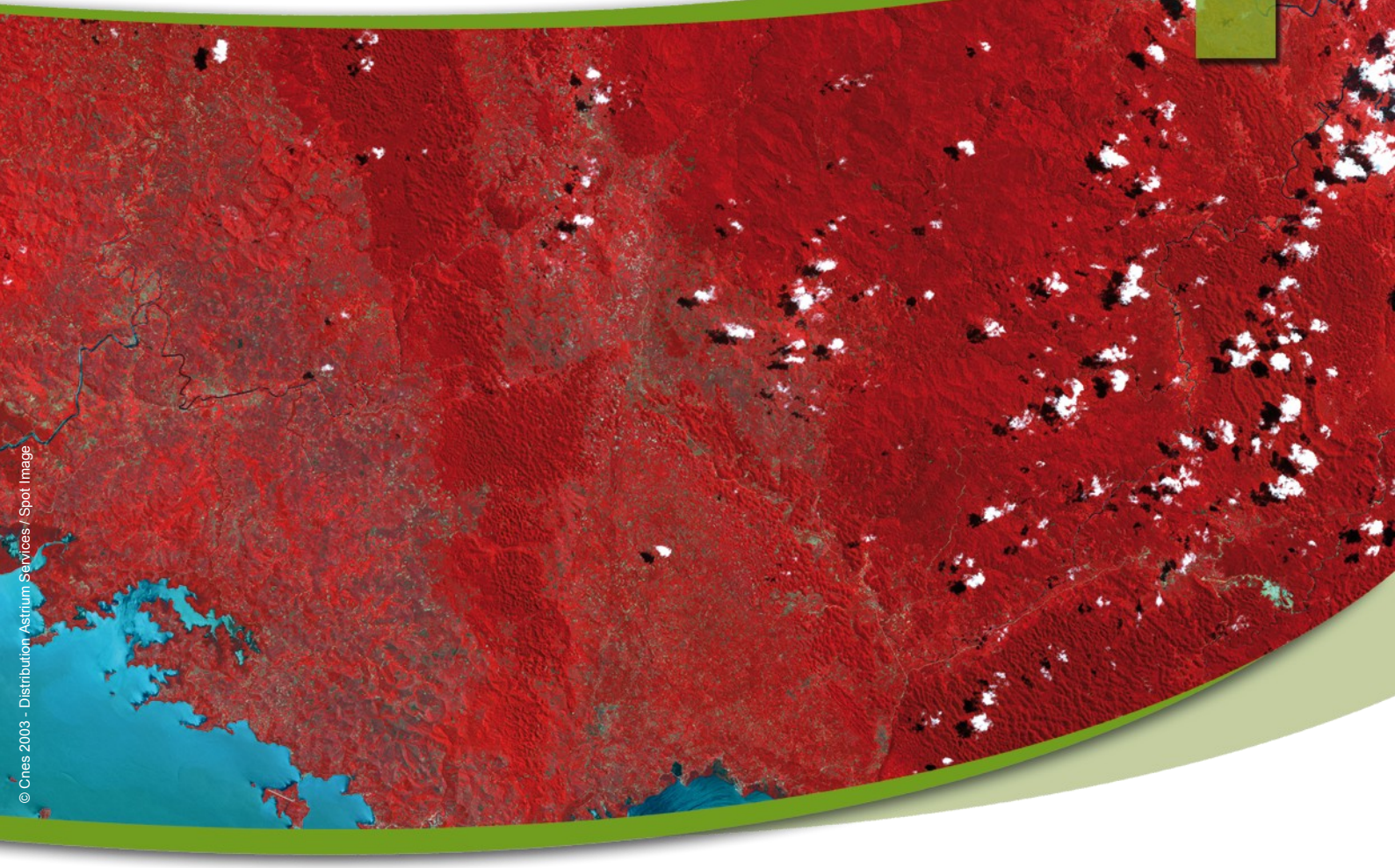
Early Warning and Early Action Through Landscape Mapping

Human Issues

Project



The Philippines, especially the Eastern Visayas region, are increasingly forced to cope with natural hazards like tropical cyclones and floods, making it one of the most disaster-prone countries in the world. For GTZ, early action is the key to reducing the number of human casualties and the extent of damage. Help can be targeted if the exact locations of vulnerable populations and areas are known.

Partners

- Institute for Geo-Information Science and Earth Observation (ITC).
- Regional Environmental Information System (REIS).
- University of the Philippines, Tacloban Campus.

Project Stakeholders

GTZ (Gesellschaft fuer Technkische Zusammenarbeit) is a federally owned organization and has operations in more than 130 countries worldwide. It works in the field of international cooperation for sustainable development.

gtz Disaster Risk Management in Development Cooperation

planetaction

Reducing Flood Risks in the

German Technical

What Can we do in the Face of a Disaster Like a Flood

Using all available sources of information is essential for early actions including prevention. This means working closely with local communities to assess and address the root causes and determine the appropriate risk-reduction measures. A first key step is to provide vulnerability and risk maps to establish an environment strategy that can help reduce the vulnerability of populations (planting trees against landslides, raising houses on stilts, etc.).

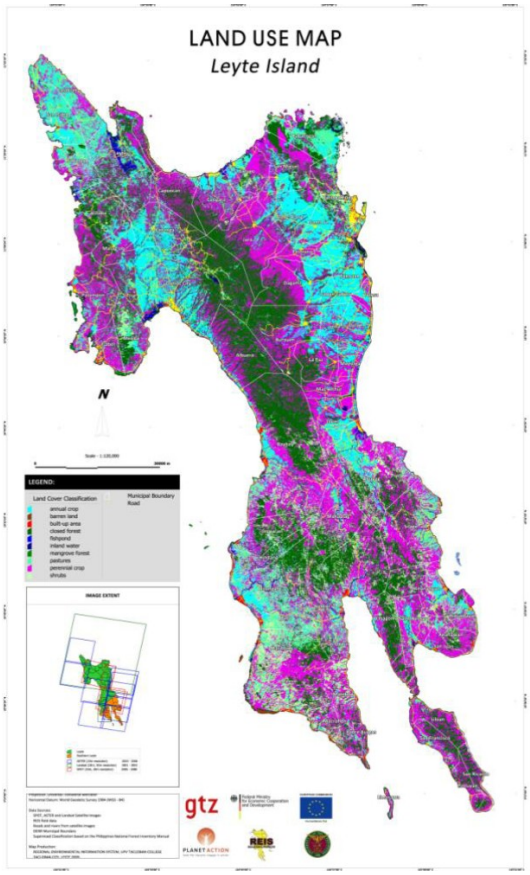
Evaluating and Mapping Vulnerability

Detailed land-use/land-cover maps are needed and can be generated by combining satellite imagery (SPOT, Aster and Landsat) and field survey data. In this project, ITT Envi image processing software facilitated the accuracy and recognition of elements. ESRI ArcGIS software was used to generate a complete database linking surveys and any georeferenced data to the land-use/land-cover maps (see map opposite).

Local data and information from experts on the vulnerability to natural hazards (floods, typhoons, landslides, etc.) of different forms of land use and land cover (settlements/urban areas, crops, forest, etc.) were collected and a vulnerability level attributed to each.

For example, the map on the right shows the vulnerability of Leyte Island to flooding.

For each form of vulnerability identified, an expected damage cost was calculated in Philippine pesos (see table).

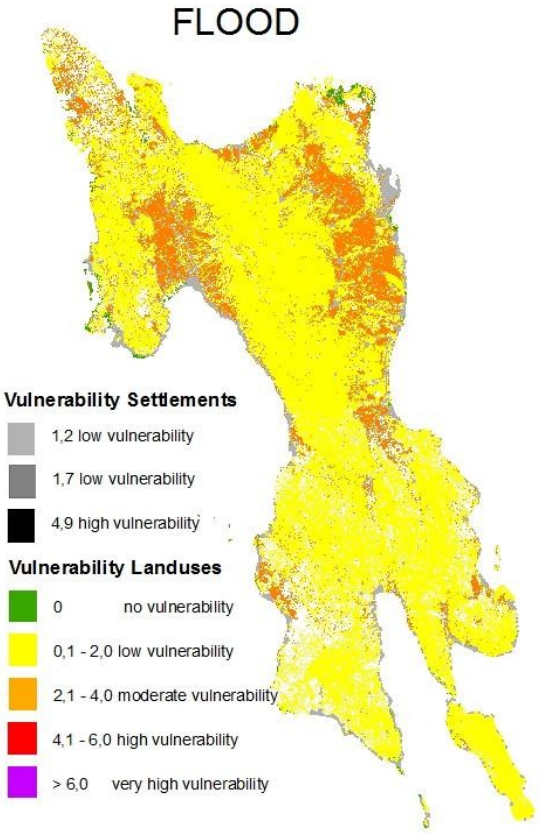


Tech Corner

- Land use describes human changes to the natural environment or wilderness, such as croplands, pastures and forests. Land-use information helps to develop better management, for example to reduce the vulnerability of populations to floods.
- Land cover describes physical material on the surface of the Earth, including forest, bare ground, vegetation and water bodies.

Eastern Visayas, Philippines

Cooperation (GTZ)



Is it Possible to Assess Likely Damage Due to a Future Hazard ?

Hazard data and maps from various sources were gathered to produce quantitative maps for the most severe hazards concerning Leyte, like typhoons, rain-induced landslides and river floods.

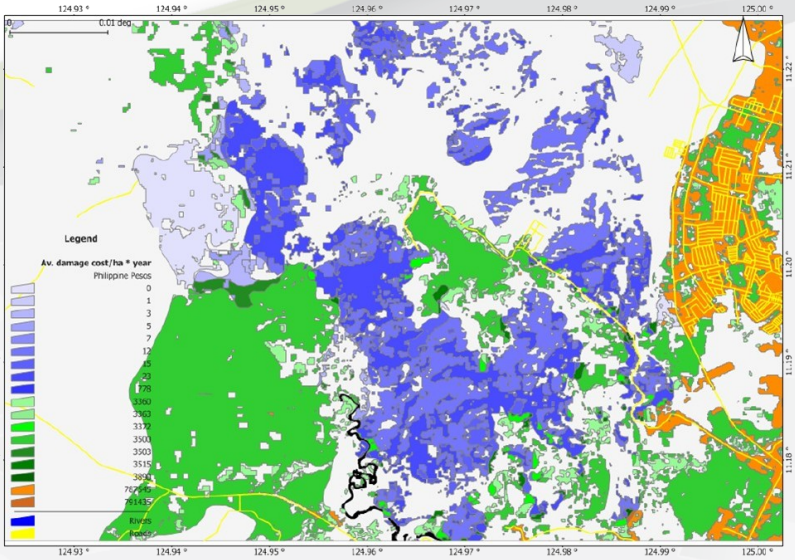
Vulnerability and hazard maps were overlaid to produce risk maps for the different hazards (see figure below). They reflected the expected annual combined material losses for each municipality in Philippine pesos (see table).

Land use	Replacement cost per hectare in Philippine Pesos
Annual crops	
Rice	30,000-40,000
Corn	18,000-24,000
Perennial crops	
Coconut	27,000
Banana	36,300
Natural sites	
Mangroves	15,700
Closed forest	51,200
Settlements	
High quality houses	9,900,000
Low quality houses	3,850,000

What Local Actions are Being Taken ?

The resulting risk maps are being used in at least 15 municipalities and 2 cities in Leyte Island.

Political decisions to identify priority areas for mitigation or prevention measures and to reduce the exposure of persons and material values in the future can be now taken objectively.



Map of expected average damage per hectare, per year caused by rain-induced landslides and floods (GTZ).

"We used satellite imagery provided by Planet Action to produce land-use maps of two provinces in the Philippines (Leyte and Southern Leyte) and then calculate a replacement cost for the different land uses. With these maps, we were able to create vulnerability maps corresponding to each type of hazard and then multi-hazard risk maps. These last are important tools for planners, as they can identify hot spots where urgent action is needed."

Olaf Neussner, Chief Advisor for Disaster Risk Management, GTZ

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