

Mapping of forest cover and assessment of ecosystems and ecosystem services related to local livelihoods

*Cucubá River micro-basin,
department of Quiché, Guatemala.*

The municipality of Santa Cruz del Quiché, located in the Quiché Department of Guatemala, is characterized by degraded natural resources and a population highly vulnerable to climate change impacts. As part of the Partners for Resilience programme, Guatemalan Red Cross and Wetlands International conducted a study to map the forest cover and ecosystems of the Cucubá river micro-basin in Santa Cruz del Quiché. The study also describes the ecosystem services that are crucial for local livelihoods, disaster risk reduction and climate change adaptation.

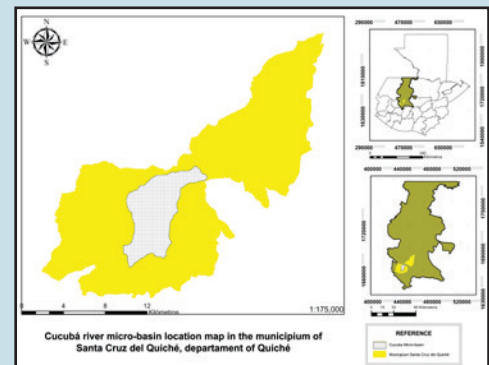
The study concludes that:

- 53.27% of the micro-basin displays adequate land use, but one third (29.28%) is being overused. The primary use is agriculture, despite the low yields of the used land due to its forest vocation.
- Threats and risks exist of natural, human and mixed origin (socio-natural) origin.
- The ecosystem services (both provision and regulation) in the micro-basin are highly interdependent with local livelihoods.

The study proposes zoning for land-use planning with a climate change adaptation approach in the micro-basin's high risk and degraded areas, as well as in areas generating hydric recharge and other ecosystem services.

The Cucubá river micro-basin

- Area: 34.50 km².
- Perimeter: 31.42 linear kilometers.
- Part of the Motagua river basin, which flows into the Caribbean Sea.
- Geography: subtropical low montane moist forest.
- Main uses: agriculture, mixed forest, agricultural crops and scattered trees.
- Land-use: appropriate (53.27%), in overuse (29.28%) and sub-used (11.95%).
- Forest cover: 56% without cover, 20% mixed forest, 18% intercropping and 6% coniferous mixed with crops.



The population of the Cucubá river micro-basin:

- Inhabited area: 5.33% of the micro-basin.
- Population: 21,073 inhabitants.
- Livelihoods: mainly grain crops for subsistence.
- Main economic activities: surplus sales of agricultural crops (corn and beans), domestic animals, services and labour.
- Services: public and private health, education, security, transportation, drinking water, sewage and garbage collection, mainly in urban areas.
- Organizations: Community Development Councils (COCODE), deputy mayor, as well as women, parents and water committees.

Cucubá micro-basin ecosystem services

The ecosystem services are highly interdependent with the livelihoods of micro-basin's inhabitants. These ecosystem services are:

- Provision: food, drinking water, construction materials and fibres, fuel or energy use, wildlife habitat, pollination of economically important crops, etc.

- Regulation: liveable climate, water and air quality, maintaining of soils and their fertility, buffering of extreme weather events, events, etc.
- Social, cultural, spiritual, aesthetic, recreational and educational services.

Threats and risks

The existing threats and risks are of natural, human and mixed origin (socio-natural). The main risks are: winds, landslides, forest burning and fires, deforestation, erosion, flooding, pollution, mining, and drought. These occur mostly in areas that are susceptible to erosion, which are: a) areas with steep slopes, and b) surface soils without vegetation cover and/or with little or no use of the land or soil.

Micro-basin management for climate change adaptation and disaster risk reduction

The study proposes zoning for the development of a *Land-Use and Microbasin Management Plan* in order to maintain the appropriate balance between the conservation and use of the micro-basin's resources.

The zoning is based on a biophysical and socio-economic analysis of the micro-basin, as well as on identification of the following conditions: risks and threats, land use capacity, use intensity, and critical areas (related to current uses, potential erosion, relief, slope, presence of streams, etc.).

The *Land-Use and Microbasin Management Plan* consists of several programmes with the aim of promoting research and natural resource conservation of the micro-basin; and to strengthen communities' management and reduction of risks and threats through sustainable and non-polluting production activities, public participation, and the production and dissemination of information.



The Cucubá river micro-basin has severely damaged natural resources.
Photo: ECODESSA

Proposed recommendations for key actors in the micro-basin

- The creation of a Micro-basin Committee for the monitoring and evaluation of management activities within the micro-basin comprised of community representatives, the municipality and support organizations.
- To ensure the implementation of programmes for micro-basin management:
 - Promote the involvement and empowerment of all existing actors related to the conservation and management of the micro-basin's natural resources (COCODE, deputy mayor, local committees and organizations) for the generation of ecosystem services.
 - Apply the following approaches transversely: watershed or basin approach, gender, institutional participation, multi-culture, opportunities for the improvement of living conditions, trans-generational, sustainability and precautionary.
- The micro-basin communities are currently being affected by climate variability (heavy rainfall, prolonged droughts and extreme frost), causing crop failures and problems in the conservation of natural resources. These communities can benefit from a programme that includes reforestation, and the management and conservation of forests.
- Develop effective communication mechanisms between the organizations in charge of natural resource management in the micro-basin and the local population.

Proposed recommendations for key actors in the micro-basin

