

Sustainable tourism and clean water project for two Guatemalan communities: A case study

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Abstract

The close proximity of two Guatemalan villages to the turquoise lagoons of Sepalau in Chisec, Alta Verapaz, made these lakes the communal washing site for over 200 families. As a result, the lagoons were contaminated with soap and bleach chemicals. Community members, with the help of a Guatemalan sustainable development organization (Fundacion Solar), the United States Peace Corps and Sandia National Laboratories, designed an electric submersible water pump system used to fill cement communal washing station tanks that were to be built in the jungle surrounding the lagoons. The proposal was prepared and submitted with a detailed budget to the United States Agency for International Development's (USAID) Mission in Guatemala in 2004. As part of the project, "Artificial Wetlands" were built in a series of three drainage ponds connected to the washing station by tubing, designed to treat the soap and bleach contaminated wastewater with native plants before it flowed back into the lagoons. These plants are very effective in removing chemicals associated with soaps. The project's implementation successfully improved the environmentally destructive washing practices of the women who had been washing for many years in the lagoons, and has raised the health and economic status of community members. To ensure project sustainability, payment and washing schedules were established in a 2-month training course for the community members after construction. Currently, the community uses funds from a small washing fee that is collected to repair the pump and maintain the site.

Keywords: Guatemala; Contamination; Treatment; Wash; Indigenous; Sustainable; Constructed wetlands; Governance; Training

1. Introduction and background

Chisec, Alta Verapaz is found 76 km north of the city of Cobán, 289 km north of Guatemala City, in the

jungles of one of the most remote regions of Central America. Its landscape is dotted with porous limestone towers, hundreds of caves where Mayan pottery was broken during ceremonies that took place over a thousand years ago, and thick jungle forest that is still virgin in many parts of the area. The county of Chisec is a

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Fig. 1. Karst mountain formations in Chisec.

2000 km² area of this green mountainous terrain where karst (Fig. 1) formations like sinkholes, caves, lagoons and rivers are common [1].

The term karst describes a distinctive topography that indicates dissolution (also called chemical solution) of underlying soluble rocks by surface water or ground water. Although commonly associated with carbonate rocks (limestone and dolomite) other highly soluble rocks such as evaporates (gypsum and rock salt) can be sculpted into karst terrain. Understanding caves and karst is important because ten percent of the Earth's surface is occupied by karst landscape and as much as a quarter of the world's population depends upon water supplied from karst areas. Although karst processes sculpt beautiful landscapes, karst systems are very vulnerable to ground water pollution due to the relatively rapid rate of water flow and the lack of a natural filtration system. This puts local drinking water supplies at risk of being contaminated [2–5].

Until 2003 when the road was paved, getting to Chisec was a full day trip from Cobán, and a walk to any of the municipality's 200 villages was like a 500 year trip back in time, where foreigner presence and the Spanish language were extremely rare. Q'eqchi Maya is spoken as the primary language of the region, and Mayan customs still reign today in everyday life [6–8].

The Lagoons of Sepalau are four turquoise lagoons 12 km east of the town of Chisec (Fig. 2). They are fed by an underground river and are surrounded by jungle and white limestone cliffs. The communities of Sepalau and Sepoc II have settled close to these

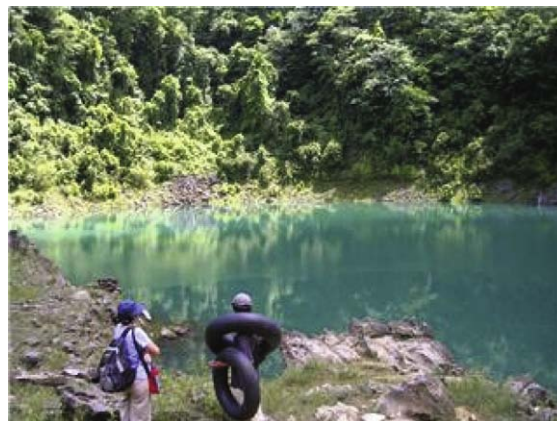


Fig. 2. Lagoons of Sepalau: ecotourism paradise.

lagoons as a water source because potable water is still absent in most of the villages of Chisec [9]. With the help of a United States Peace Corps volunteer, the lagoons of Sepalau opened as a community ecotourism site in 2002. Initial administrative challenges included legalization of the community ecotourism venture as a business under Guatemalan law, creating a small protected area surrounding the lagoons where farming would be illegal, training community members as tour-guides, and agreeing upon where income obtained from visiting tourists would be invested to benefit the whole community.

Environmental challenges also initially affected the ecotourism venture, especially in the months of March to August, when the temperature in Chisec approaches 115 F and rainfall is scarce. The barrels and bags that community members use to catch rainwater dry up quickly during this season. The lagoons drop 50 m in depth, and the women are forced to wash all clothing in the lagoon because household water from rainfall is no longer available. When the women wash clothing, they use soap and bleach, and leave certain regions of the crystal blue lagoons creamy white in color with contamination.

2. The project

By 2004, the communities had recognized the need to protect and conserve these lagoons, but at the same time, they were still forced to utilize the lagoons as a source of water for drinking, bathing and washing

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