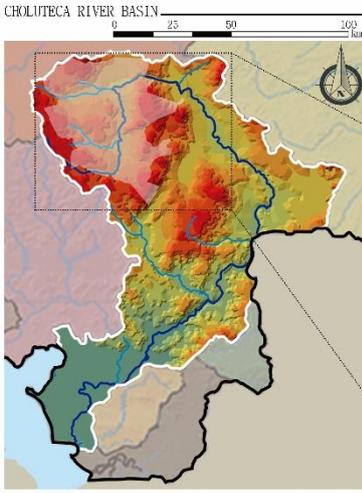
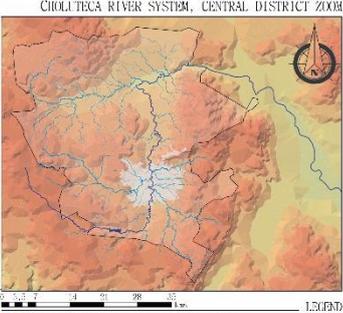


WWCH 2018 PROBLEM DESCRIPTION

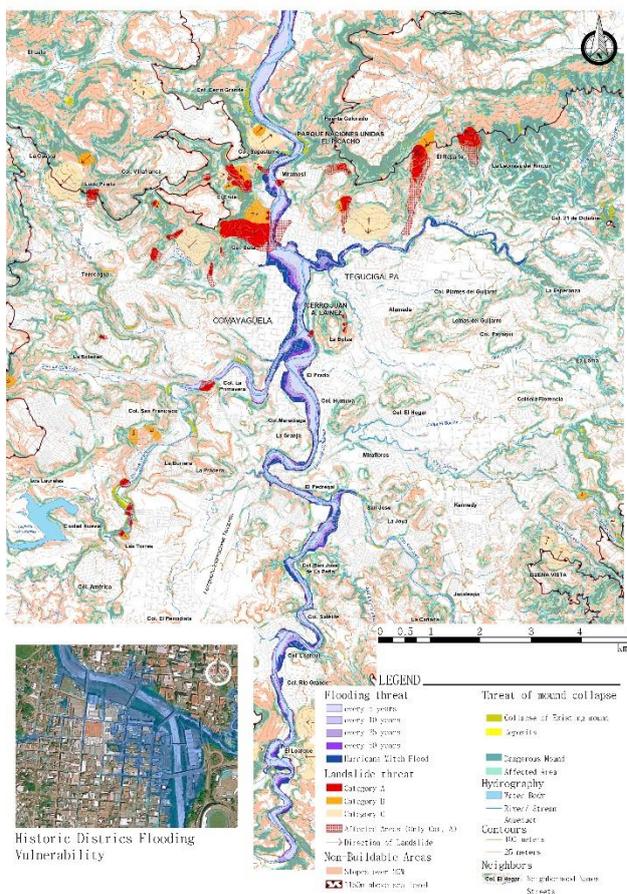
Problem Title	
Choluteca River “Mad Waters”	
Contact Information	
Name	Jessica Margarita Barahona Aragon
Country	Honduras
1. Basic information	
<p>The segment of the Choluteca River –locally known also as Big River (Rio Grande)- that runs through the Metropolitan Area of Tegucigalpa is part of the Major Choluteca River basin that encompasses part of the central and south regions of Honduras. Nearly 1.56 million of inhabitants -around 20% of the total population of the country- are located in the Choluteca River basin. Around 30% of it lives in rural areas and 70% lives in urban areas, including the capital city Tegucigalpa. For this reason, the basin has become in one of the most important and one of the most populated among the 21 river basins that cover the territory</p> <p>The river is fed by several watersheds of tributary rivers such as Del Hombre River, Guacerique River, Concepción-Choluteca River, Sabacuante River and Chiquito River. The watersheds of these rivers feed the Choluteca main branch and are therefore of great environmental importance to the River System. Not in the least, they are important sources of potable water for the Capital city. As a whole, the watersheds that surround Tegucigalpa have a production capacity of 225 million cubic meters per year.</p>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  <p style="font-size: small;">CHOLUTECA RIVER BASIN</p> </div> <div style="width: 45%;">  <p style="font-size: small;">CHOLUTECA RIVER BASIN LOCATION</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;">  <p style="font-size: small;">CHOLUTECA RIVER SYSTEM, CENTRAL DISTRICT ZOOM</p> </div> <div style="width: 45%;"> <p>Because of the unplanned urban expansion of Tegucigalpa, Comayagüela, there has been a continuous deforestation in the surrounding areas in order to clear land for housing, industries, and other facilities, and to provide firewood for domestic use. Additionally, every year during the dry season, forests fires, that leave top soil without vegetation cover making it prone to erosion, affect the capital. Yet, deforestation and forest fires is not only concentrated within the city boundaries as it also spreads in the surrounding watersheds. All watersheds of the area present severe and irreversible reduction of native fauna species of the original system in its lower, medium and highlands. The degradation and deterioration of habitats due to agriculture, livestock, industry, and urbanization activities have fragmented the forest in such a way that the animals have migrated to remaining forest remnants. Moreover, the removal of forest vegetation –as seen in the region- presents itself as a great issue as it decreases evapotranspiration and increases stream flow. Increases in the base and storm flows resulting from deforestation are generally proportional to the area and extent of vegetation removal. Therefore, the accumulation of deforested areas within the drainage network of the Choluteca River might be one of the biggest cause of Tegucigalpa’s flooding.</p> </div> </div>	
2. Water Circumstances (Optional)	
<p>The river – essentially black in color and with emanation of offensive odors - has become a place of waste disposal, where, untreated residual water goes directly into the river and common garbage runs down into the river due to rain. For many</p>	

years, the river has served as an open sewer for discharging untreated wastewaters from all type of uses: domestic, institutional, commercial and industrial. Recent Studies indicate that the biological oxygen demand of the river is 74 tons per day with a concentration of 8mg/l, which makes the Choluteca the second most polluted river of the country.

3. Problem description

Honduras is considered as one of the most vulnerable developing countries to natural phenomena caused by climate change. The city of Tegucigalpa , capital of Honduras, has been exposed to diverse natural catastrophes, which have enormously affected its urban development. According to the Honduran Magazine Let's talk Clearly (Hablemos Claro), since 1906, the "mad waters" of the Choluteca River have imposed fear in the inhabitants of Tegucigalpa city. By 1998, six hurricanes had already left an undeniable mark on the history of the city. Although the number of hurricanes and tropical storms that have affected Tegucigalpa has been high in numbers, two of them have been the most lethal: hurricane Fifi in 1974 and hurricane Mitch in 1998. These two incidents have remembered us that natural phenomena are cyclical and they will be repeated without a doubt eventually with equal or worse consequences.

The Hurricane Fifi and its passing through the country left severe damages, uncountable deaths, and enormous economic losses. Particularly, Tegucigalpa city was affected by the floods of Choluteca River. This climatic phenomenon, that occurred more than forty years ago, is considered one of the most devastating and destructive in the 20th century, until the passage of Hurricane Mitch in 1998. In 1998, while the hurricane crossed the Honduran territory, it discharged more than 600mm of rain for five consecutive days causing the massive overflow of rivers. The Choluteca River alone reached up to six times its normal width. The flooding destroyed some of the bridges that connected Tegucigalpa and Comayagüela and buried in mud countless residences and state properties located in the historic districts and nearby areas. Although, since Mitch, the capital has not been able to fully recover, a great deal of diagnostic analyses and action plans –supported by the international community- have had their genesis on the aim of first of all, the size the risk and vulnerability of Tegucigalpa and second by to, formulate plans in benefit of its sustainable development.



With the increasing flooding issues in the riverbanks of the Choluteca River and nearby areas that are constantly leading to big economic losses, losses of properties and life, the Government has started developing project proposals for the regeneration of the area. . Yet, previous and currents plans for the River mainly focus on the river and the historic districts of Tegucigalpa. However, large-scale disturbances initiated in the watershed areas are reflected in the lower regions of the river system. Therefore, land-use and vegetation changes in such watersheds –either with positive or negative impact- are directly proportional to the Urban Choluteca River. Hence, it cannot be emphasized enough that the issue will not be solved in the river alone as environmental issues are also generated in the catchment areas. On the other hand, during summer the capital is affected by the drying up of its water resources, so that long water rations have been prevailing already for many years. With the aim to diminish the drought periods of the capital city, the Government has been carrying out studies and plans to build more dams in the watersheds; yet, particular concern has been expressed on the effects of large dams on the river systems downstream of them. This concern is justified in that

the dams would probably alter the river flow and transport sediment downstream.

The city of Tegucigalpa has failed to see the negative impacts that human activities have had on the river. Major human activities such as land mismanagement, unsustainable use, pollution of resources, and especially the unconsciousness of the inhabitants have affected the riverine ecosystem.

Due to its location, the river can work as a structural connector within the urban fabric and create an impact for the more than 1.2 million inhabitants of the city. The importance of this natural feature in the urban system is precisely why its regeneration is a catalytic factor for the transition of the capital city to a sustainable city. The river is the key to develop a new cultural narrative towards ecological, social, and cultural sustainability that will increase awareness among every citizen including the poor and politicians.