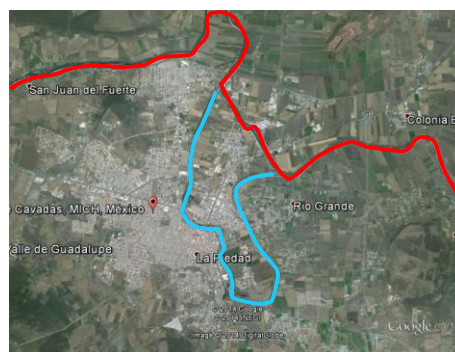


## **Recovery of the water flow in the tributaries of the meander of the Lerma River.**

"The Lerma River is the longest of Mexico's inland currents, it is 708 kilometers long and drains a basin of 47 116 km<sup>2</sup>, it originates in the State of Mexico and crosses Michoacán, Guanajuato and Jalisco to flow into Lake Chapala. On its way it receives rubble and garbage of all kinds, and is currently very polluted.

On its way through La Piedad, Michoacán, it takes the form of a meander, which covers a large part of the conurbated area of the La Piedad-Pénjamo Metropolitan Area. During the whole life this zone was flooded frequently, until, in the flood of 1973, several people presented the project of drawing a relief drain to avoid it, as it happened, only that, to date, very little or no water circulates in the bed of the meander and it has become a river with garbage, during the dry season.



For the last 5 years, several organizations, gathered in the Metropolitan Citizen Observatory (including the Rotary Club of La Piedad), have dedicated themselves to carrying out research so that from an integral perspective the rescue and sanitation of this meander, in an extension of 12.5 kilometers, is sought. Why should the project be located only in the 12.5 kilometers of the meander? for the simple reason that covering the entire basin would be an impossible task at this time, but if we start this meander, we will be able to identify areas of opportunity and replicate lessons learned in other territories of the basin and with other Rotary clubs and interested organizations”<sup>1</sup>

<sup>1</sup> Rotarians: Rescue and integral sanitation of the meander of the Lerma River in La Piedad, Michoacán, México. Contest document sent to WASRAG by José García León, Rotary Club La Piedad.

The main need of the project is ***the recovery of the water flow of the tributaries in the meander of the Lerma River in La Piedad, Michoacán***; since every day it has been drying up due to multiple factors, among which the following stand out: the need to redirect the water to the large urban centers (Mexico City and Guadalajara), the overexploitation of the aquifers and the pollution, in addition to the increase of the cultivable areas in the basin.

The integral project to clean up the meander of the Lerma River in La Piedad is integrated by several nodes, and the stages to develop it require working project by project, without this having to do with the chronology of its realization. The following are cited as specific projects:

- Ticuítaco Mill Park.
- Water Museum.
- Botanical garden "Presa Cinco de oros".
- Farms and technology: San Francisco hydroelectric plant.
- Site and park museum: Waterfall of El Salto.
- Andador del Lerma.

The Ticuítaco Mill Park is a proposal that tries to rescue the history of the driving force of water, used in colonial times for the grinding of grains. There are vestiges of the mill and a proposal has been made to establish a theme park between the Ticuítaco Dam and the mill, designed by students of the Architect Engineer degree from the University of León, La Piedad campus. With the theme park is considered the integration of the circular curtain dam, built in 1746 as one of the points of interest for the Water Route. In the margin of the dam and to one side of the neighboring road to Los Lopez, the Rotary Club of La Piedad has made the plantation of 80 ahuehuetes (sabinos) with the intention not only of setting a micro region but also as an area of sensitization so that the neighbors commit themselves in the conservation of the trees and they are the main motor for their care. The project considers the possibility of feeding it during the dry season with the runners of the Ticuítaco Dam that feeds on the water that comes down from Cerro Grande: it is the first tributary to clean up the Lerma River.





In the Cinco de oros Dam, with the participation of the organizations that make up the Metropolitan Citizen Observatory, flora studies have been carried out to determine the species that can be used for forestation; there has also been support from the College of Architects to draw the contour lines and the Rotary Club of La Piedad to achieve and carry out the planting of 30 ahuehuetes and native trees (10 mezquites and 10 guamúchiles); with the support of students from different institutions (UNIVA, Instituto Tecnológico, Cobaem, Conalep) and different groups of volunteers; as well as the collaboration of students from the Juana de Asbaje School to maintain the trees planted. The La Piedad Potable Water and Sewerage System (SAPAS) has provided support for the draining of the dam and the repair of the curtain to collect water and not allow it to be lost. In this way the collected water can be managed for the municipal nursery and the surplus to feed the meander of the river Lerma constituting a second tributary of the river Lerma.



"At the proposal of the Metropolitan Citizen Observatory, the construction of a "Sendero" (walker) is being carried out to serve, among other things, as a track to support urban mobility by bicycle, or as a walker to walk for pedestrians. It is currently 50% advanced.



On the occasion of World Water Day (March 22, 2018) the Rotary Club invited students from the Instituto Tecnológico, the Universidad del Valle de Atemajac and Conalep to clean up the "Sendero" along the left bank and the river bed, removing 23 tons of garbage, which with the support of Municipal Public Services and vehicles from the Instituto Tecnológico, were taken to their final destination in the sanitary landfill<sup>2</sup>. This activity is part of the objectives of "The social appropriation of the banks of the Meander", because an important part of society has found a comfortable place to throw their waste in the river, without considering the damage it is causing and to perform the cleaning inviting them not to continue doing so, is how little by little can be clean, not so much for the cleaning but because they stop receiving the waste. It also supports the recovery of the meander as a natural area in flora, fauna and land uses appropriate to the prevailing ecosystems. Of course, it also collaborates in the recovery of the meander's biodiversity, by promoting the balance of ecosystems, respect for the variety of life forms, considering that human action is the main threat. By inviting different universities and civil and government organizations to participate, coordination begins with the different levels of seeking the commitment to participate, since a project of this nature requires joint participation and the financing costs are very high.<sup>3</sup>

During the month of May 2018, a second cleaning campaign was carried out in the river diversion, located in the municipal limits of La Piedad (Michoacán) and Pénjamo (Guanajuato), with students from the Colegio de Bachilleres del Estado de Michoacán, from the Instituto Tecnológico and authorities of Santa Ana Pacueco, Gto, 5 tons of waste were extracted (within them approximately 2 tons of tires). With this, the social appropriation of the project has been consolidated in the student sector as a diffuser of the project, towards society, starting with their families.

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<sup>2</sup> The operative phase of the project has been started with cleaning and simultaneously work of the general construction of the project, as well as studies to achieve the megaproject of the rescue of the meander of the Lerma River in La Piedad.

<sup>3</sup> Idem

According to SAPAS reports, 95% of urban and rural wastewater is treated in the two existing plants: El Cuitzillo and Ciudad del Sol. Thus the left bank of the river shows a great advance, missing the right bank that corresponds to Pénjamo.

During the month of March 2019 different activities were carried out on the occasion of World Water Day:

- A photography contest entitled "El Lerma y sus secretos" (The Lerma and its secrets), 16 photographs having been received.
- Talk-workshop on "Reforestation Protocol".
- Ahoyado as initial phase to carry out the reforestation in the "Presa Cinco de oros" and in the Presa de Ticuítaco.
- Conversation entitled "El Lerma: possibilities for his recovery".

Students and collaborators from Colmich, UNIVA, Instituto Tecnológico, CBTis no. 84, Conalep, Cobaem, as well as Municipal Government agencies (SAPAS, Ecology and Environment Coordination, Public Services Directorate) participated in the different activities.



As great strengths are the different organizations integrated into the Metropolitan Citizen Observatory: The College of Michoacan (Public Center CONACYT), The Technological Institute, The College of Architects, The University of Valle de Atemajac, University of Leon, The Rotary Club, The National Chamber of Commerce, The offices of the City Council of La Piedad: Instituto Municipal de Planeación, El Sistema de Agua Potable y Alcantarillado, Dirección de Servicios Municipales, several independent citizens what makes a mosaic of professional profiles and wills willing to offer the best of themselves, before thinking about themselves.

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