Universidad Autónoma de Tlaxcala

PROJECT

Water sources, community, care and sanitation: An Approach To governance and Bioculturality

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Introduction

The state of Tlaxcala has been suffering decades of degradation of its water sources caused, among other reasons, by institutional inattention to preservation and by forgetting its responsibilities regarding sanitation and cleaning, which has also been a matter neglected by the citizens themselves. Special attention has been paid to the preparation of diagnoses on the surface water that runs along the Zahuapan River channel, since its notoriety has grown due to the countless samples of contamination it manifests. However, it is becoming increasingly necessary to direct attention to the entire basin, since pollution problems are not only related to surface waters, including rivers, streams, dams and lagoons, but also to the waters that refill phreatic mantles.

Regarding the care that must be taken in the recovery of components of the basin, it is urgent to put in place the actions that can be carried out by combining the efforts of citizens—individually, in organized groups or in community intervention processes—since their presence In all regions, is basic in the solution of a problem that already causes severe damage to human and existing ecosystems health and life.

To put into perspective the approaches of a project that addresses the concern for preservation, seen from the relationship that exists between the cultural components of various communities with local meanings, practices and knowledge, and the options for combining efforts between groups of researchers, scientists and community groups belonging to the municipality of Tlaxco in the state of Tlaxcala, it is necessary to know a set of cultural elements that are important because they can implement practices that offer guarantees of solving primary needs for the use of water through harvesting rainwater, contribute to conserving bioforms of water capture in forested soils or that were forested and have to be recovered, recover their vegetal cover, introducing gray water sanitation and its use, among others, are steps to achieve recovery of the health of the basin.

The experience of research and intervention work in the upper basin can be carried out and expanded in sites in the middle and lower basin.

This is a conceptual framework that aims to open space for community participation, initiate processes of social management of scientific knowledge and focus not only on water, its uses and problems but also on cultural elements useful for achieving consensus about preserving environmental resources.

1. Conceptual - Theoretical Background

1.1 Governance

It is positive that various diagnoses have been carried out and very different official and unofficial entities have participated; these efforts have been recognized by different government administrations at the three levels concluding that it is necessary to carry out remediation, preservation and improvement activities on the basin. However, It is discouraging that there's a lack of realistic programs, since just a few resources are invested in human, material and economic resources; Additionally, it is observed that the legislation is not sufficient in terms of its compliance, if at all it has occurred, does not reveal how it contributes to the rescue and preservation of the basin's resources.

These factors that come together and cause damage to water sources and communities, have to be addressed with policy and government action perspectives that encourage and include communities, not only to inform but to participate from the analysis of the problems themselves. problems, rescue local knowledge, apply various techniques to improve water provision, apply techniques to make more careful use, encourage citizen and political participation to disseminate actions and put pressure on authorities to commit to do more than diagnoses and statements.

An approach that opens possibilities for the above is the concept of governance, which implies a set of interacting elements whose purpose reflects institutional and citizen responsibilities. The definition adopted by Rodríguez (2010) is the following:

> ...the notion of governance, when applied to water management, refers to 'the capacity of society to identify its problems and challenges, design appropriate solutions and implement the institutional framework that allows it to efficiently respond to and overcome said problems and challenges' (Corrales, 2002). This concept includes the ability to design public policies (effective, socially accepted and aimed at the sustainable use of water) and manage sufficient resources for their implementation. (p.26).

The concept does not encourage a governmental institutional intervention as if it were necessary and/or depended on it to address the problems, it is rather about the involvement of a community or a population in the identification of the same and in the development of management and care capacities. to build solutions or alternative solutions.

For some time now, the set of problems related to the use and management of water for its use, management and sanitation is no longer conceived as a matter that requires the powers of different official and governmental bodies, given that the effects on the basins reflect a complexity not easy to understand, since it does not depend only on studying and/or diagnosing, it: beyond that, now it is necessary to integrate considerations for the design of programs—research and intervention—of different nature: economic, political, social and cultural that are in a direct trajectory not only locally but at a global level, as Rodríguez (2010) expressed it.

At a global level, in the specific case of environmental issues, including those related to water resources, the visualization/conceptualization of the existing problem and consequently the way in which it is analyzed and alternative solutions proposed, from the perspective of globalization processes. economic, financial and sociocultural, has led to the emergence of comprehensive proposals that consider the addition of social, cultural and economic aspects to the merely technical aspects, which in theory are more appropriate, but in fact their implementation is extremely hard due to the diversity and complexity of factors to take into account (Casola-Clarisó, 2003).

Then, involving groups, communities, organizations and citizen actions constitutes a central starting point for the operation of conservation, management, recovery initiatives and those that are capable of achieving achievements whose benefits are extended since they do not only affect in favor of the actors in action but to all those who make use of the water resources of the basin.

Rodríguez (2010) also mentions in his study that the time in which the only concern was distributing and guaranteeing access to water for the populations has been exceeded given the difficulties and damage experienced by the national basins, particularly the Zahuapan-Atoyac basin. It clearly already shows alert levels due to pollution, which is why a new comprehensive approach has become necessary. Integrated Water Resources Management (IWRM) is presented as an alternative and complements the governance approach:

Integrated water resources management (IWRM), as a new approach to water management, emerges as a proposal at the international level to stop the deterioration of water resources, assuming the existence of a liberal democratic framework, which allows societies to influence the decision-making processes that benefit or affect them. IWRM within the framework of democratic societies whose decision-making processes refer to the existence of good governance, is characterized by greater interaction and cooperation between the State, its institutions and civil society, implies a change of direction of the government, from the vertical hierarchical (or pyramidal) control model, towards a new horizontal decision-making model (p.25).

As you can see, it is not only necessary to set technical objectives but also to begin the work of identifying cultural values and customs to understand their influence on the community's

determination to ensure their right to water, assimilating their own experiences and learning to recognize the resources. citizens who can mobilize. An important vein to develop actions is aimed at the search for essential scientific and technical knowledge, which can be translated into simple terms and, subsequently, be used by the inhabitants of the communities to understand their specific situation with which, later, they will design plans. to widely and decisively manage the water they possess and/or are capable of obtaining from various sources, rain mostly. We are talking here about all the water that can be dedicated to daily activities in homes or in economic activities that are specific to them within certain limits and, in addition, about the contribution they can make to conserve or clean what is necessary to preserve a healthy environment.

The author already cited indicates that it is also necessary to understand the functioning of the supply and sanitation processes to know the respective regulatory frameworks, certainly homes and the use of water for irrigation adhere to well-known and constant needs in the quantities necessary to perform required work, including those involving irrigation of crops. The regulatory framework has the purpose of making the respective institutional plans and programs effective, thus the National Development Plan (PND) must govern the execution of, for example, the National Water Program (PNH), as well as the State Development Plans, which aim to do the following:

> 1. Solution of problems associated with water supply, drainage and treatment.

> 2. Access to water as an inalienable right.

> 3. Guarantee the comprehensive management of water resources with the co-responsibility of the three levels of government and society (Rodríguez, 2010 p. 31).

Likewise, state development plans must contemplate what corresponds to the above for the operation of their programs, added to the fact that the different entities such as the National Water Commission (CNA), the state entities that are in charge of distributing and caring for sanitation, as in the case of Tlaxcala, the Secretariat of Public Works, Urban Development and Housing (SECODUVI) and the General Coordination of Ecology (CGE), have to coordinate to achieve the programmatic goals and ensure compliance with the respective laws, in especially the National Water Law (LAN).

However, the institutional functioning for the coordination of efforts and achieving compliance with the law has achieved little in terms of care and sanitation, as is palpable in the Zahuapan River channel, in such a way that legal and institutional actions must be Adding, perhaps most importantly, social participation both in the aspects of care of water supplies and in those of sanitation, additionally, the pressure on the institutions and officials who must be in charge of the respective matters, puts it this way:

Social participation implies a level of organization and integration, which may or may not exist; social participation is only possible through the organization of interests (interest groups, social

movements, non-governmental organizations), supported by a set of informal values or norms shared among the members of a group that allow cooperation between them, which constitutes the social capital of the group in question. Social capital is made up of networks of social relationships such as the family and certain features of an institutional culture such as trust in institutions or compliance with norms, which affect the meaning and possibility of individual and collective action (Natera, 2004).

The propaganda practices of politics, on the contrary, can be transformed and constitute references regarding the potential involved in the organization and implementation of initiatives to improve public life, public spaces and services.

Participation grows and strengthens the more it is used, the same happens with social capital that focuses on the formation of social networks based on principles such as solidarity, reciprocity and trust, which alert and enrich community life. At the same time that universities build knowledge, they can be a source of resources for community training in more ways than one. Access to expert knowledge is undoubtedly necessary in aspects of health, environment and culture, among others, each of them potentially positively impacting people's well-being and coexisting with local knowledge and knowledge, we are not referring to colonizing communities with the implementation of foreign knowledge, but to the coexistence and dialogue of knowledge that contributes to enriching community life, and avoiding deviations towards the construction of new meanings that weaken the ties between its inhabitants and introduce individualistic habits and practices, which break down long-standing institutions. Preserved and useful not only for social life but also to preserve the relationship with nature.

1.2 The bio-cultural approach

Paradigm that refers to the historical recognition of diversity, both biological (agricultural, habitats, species, genomes and landscape) and cultural (genetic and cognitive) (Toledo V and Barrera N, 2009).

> Biological diversity refers to the diversification (speciation) of organisms throughout the planet. Biodiversity (variety of landscapes, vegetation, species and genes). The maintenance and conservation of biological diversity focuses on the conservation of the genetic variability of wild organisms, crops and domesticated animals (Toledo V and Barrera N, 2009).

> Biodiversity is much more than the sum of all the organisms on the planet, it is a network of relationships and processes that we continue to investigate today (Higher Council of Scientific Research, 2010 p. 1).

Toledo (2015) launches the most integrative concept of "Bio-cultural Halo" to define the binomial made up of the biological and the cultural (linguistics considered language as the greatest indicator of a culture) that form a spatially and temporally locatable totality, as a set or

system that is autonomous and that has the capacity to self-regulate (Ortiz, B and Vieira de Carvalho, A 2021 p. 3).

Thus, the concept of bio-culture refers to the interrelationship between man and nature, where the latter is not perceived as a simple resource, but rather finds a symbolic relationship with it, attributing a shared value between the community and the uses and customs that affect it. its system of social organization in addition to the conservation and cultural expression of biological diversity.

Knowledge about nature reflects the survival of a group of human beings and the manifestation of knowledge transmitted orally and by its putting into practice. This cognitive dimension was perfected over time, referring to them as traditional and that today they are threatened by modernity and overconsumption that appropriates natural goods and services in the midst of accelerated processes of urbanization and industrialization.

Leff (2004) proposes recognizing the relationship between culture, nature, the social and the political. The material is a manifestation of the symbolic and combines knowledge, meanings and identities. The concept of bio-culture has a scientific foundation that gives presence to the confluence of disciplinary knowledge of biology, ecology or geography, as it gives access to the understanding of the biological diversity of the planet (Toledo, Barrera and Boege, 2019). At the same time, knowledge and perspectives of linguists, anthropologists and ethnologists coincide, contributing to connecting social and cultural knowledge with biology, the physical territory and the study of the care and preservation of ecosystems.

It is easy to understand that we are not a specie separate from nature and that none of the countless manifestations of human action occur separate from the manifestations of life on the planet. However, it is also clear that as a species we have assumed that the mastery of knowledge that is applied to the entire socio-cultural life enables us to dominate nature and use it for the production of economic wealth, which has had devastating consequences for ecosystems.

The environmental crisis begins at the moment in which man separates himself from his natural history and begins the decline of life as the loss of meanings that entails the reification of the world and the commodification of nature. Environmental rationality is constituted by contrasted with the theories, thought and rationality of modernity, it is built on the social processes of reappropriation of nature, applying them in the construction of sustainable societies and communities guided by the entrepreneurial spirit, and sustained by the technological potential detached from ecological conditions, from production the power of science and technology, and the power of knowledge are mobilized by differentiated social interests and diverse cultural values towards a sustainable economy (Leff, 2004).

In the biocultural approach, several aspects that relate the environment to the territory are integrated, but emphasizing nature conservation. Thus, the conservationist vision of natural

spaces, indigenous peoples and local communities prevails in the rescue of ecosystems, the expressions of their ways of life, the provision of their resources as sustenance of their culture, so that the community remains in force. its comprehensive vision, as a legacy of knowledge and social practices.

Recognizing the concept of heritage is the foundation for linking the concepts of society, territories and historical times, and ethical and moral values. Biocultural heritage took off in 2005, given the concern of indigenous groups, local communities and researchers about unconventional agricultural practices that undermine the protection and promotion of cultural expressions.

All forms of knowledge are the manifestation of resources to face global challenges such as climate change, these turn out to be collective property that is transmitted through language, rituals, agricultural and horticultural practices, their cultivation methods and cultural manifestations. .

Reality has clearly imposed itself with manifestations of increasingly palpable and increasingly serious damage regarding the destruction of ecosystems. However, it is also strongly expressed that there are alternatives both to approach the problems, as well as to think about palliative alternatives that necessarily involve including the cultural forms that are located in the territories with resources to preserve the good environmental state or to remedy the damage. caused, the cultural environment can constitute a set of resources to produce a virtuous relationship with the natural environment. The knowledge, the socio-environmental movements, the project designs alongside communities with high cultural density, determination and autonomy are possessed by the indigenous populations and comparable communities that live in the centers of origin of agriculture, which have domesticated, diversified and dispersed The agrobiodiversity species that today make up the global food system (Boege, 2021) are forms of social life that make collaboration possible to establish dialogue between disciplines, since the plundering of natural organic and/or mineral resources, culture and the relationship with nature must face the invasive and extractive action of powerful companies that massify their production at a very high social and natural cost.

The bio-cultural knowledge and wisdom of family producers are still valid and play an important role in the formation of diverse agricultural systems called "traditional knowledge"[1] (Boege E, 2021).

Although in Mexico the rights, historical practices and traditional knowledge of the Indigenous Peoples and Local Communities (PICL) are recognized, as well as their importance in the conservation of the country's biodiversity, it is still necessary to articulate conservation and sustainable use actions that integrate the IPLC knowledge, innovations and traditional practices. Nor are there policy guidelines to regulate the protection of traditional knowledge associated with the use of biodiversity (Sixth national report of Mexico to the convention on biological

diversity. Summary for decision makers National Commission for the Knowledge and Use of Biodiversity CONABIO, 2019, p. 22)

Confident in the conceptions of development imposed by the capitalist economic system, which since the years after World War II has cared little or nothing about the limits involved in the disposal of natural resources, furthermore, even with the support of the Organization of the United Nations, forms of "rescue" of indigenous communities have been promoted: saving them from "poverty", "ignorance" or "backwardness" without consideration for their ways of life, but seeking to destroy their cultures to integrate them into the capitalist development. World trends driven Due to the so-called green revolution, they promoted industrialized agriculture, which was characterized by increasing technology and mechanization of production processes, as well as the need to use external inputs such as commercial seeds, pesticides, herbicides and fertilizers.

What the above has implied is that both the existence and the cultural forms that were (some still are) successful in preserving nature are disregarded. Thus, to understand what elements are involved in a research and intervention position, with an approach oriented to the care, preservation and recovery of ecosystems, it has become clear that bio-culture makes visible both those factors that cause an impact on the environment, as well as on the life of the inhabitants in a territory.

What do these inhabitants contribute and what is manifested in their cultures: ancient traditional knowledge, a different way of approaching work that not only involves the production of wealth but also elements for the construction of identity and the meaning of life; community agreements, social and environmental resources of the communities, the construction of community lives with a divine and sacred foundation that makes little difference between work, artistic production and the meaning of life. In the relationship with the source of natural wealth we find the connection of knowledge, beliefs and artistic skills that can range from the arts to food production.

The scope of the project has modest purposes and seeks to make contributions to improve problematic situations that may be afflicting communities, the orientation is towards achieving the recovery of cultural forms that have given solidity to social relationships, recovering the strength of values, traditional customs and practices in order to rescue solidarity, trust, reciprocity that revitalizes links and adds actions in favor of concerns about the environment, for which it is necessary to make contributions from scientific knowledge and establish dialogues aimed at integration with local knowledge, from the management of knowledge and social capital and quality education for all. UNESCO works to create inclusive knowledge societies and empower local communities by increasing access, preservation and exchange of information and knowledge (para. 1).

In this sense, Max Weber proposes a concept related to the social responsibility of knowledge and reveals three important dialectical tensions in this process:

(a) First of all, the need for a new pact or social contract between Science and Society is evident.
(b) Secondly, the interaction between Science and Society places the process of "knowledge appropriation" at the center of the analysis.
(c) Thirdly, this interface is also based on the development of social learning processes, through which the various social actors not only use knowledge, but also generate and systematize it, managing to create the capacity they require to respond successfully to the challenges they confront (Weber, cited in Chaparro, s/f, pp.6-7).

This is the reason why training processes that emanate from the various educational levels, but especially from higher education institutions (HEIs), must have a view that strengthens learning communities for the appropriation of Westernized knowledge, but valuing and rescuing the diverse knowledge that arises from the localities, turning said information into a public good and important inputs for the processes of creativity and significance of cultural knowledge, with the aim of empowering communities, contributing from the framework of social capital with the intention of raise the quality of life in society.

Therefore, there's a basement that generates wealth (knowledge and knowledge) not only for educational centers but also a synergy between both contexts, which, by the way, is still an arduous journey that universities have not dared to analyze. Because other ways of looking at the university curricular construction are required, seeking with this its own identity. Therefore, the invitation is to look for ways to reflect on an education oriented toward "learning to learn" and not based on memorization processes. The above implies profound reforms in the education system, such as the teaching of science and analytical thinking at various levels of the educational process, in order to develop creativity both in the person and in society (Chaparro , s/f, p, 2).

For this reason, we cannot overlook those skills and cognitive abilities that can be generated in students so that they have the possibility of continuously dialoguing with the world of knowledge and, consequently, with the world of technology.
While it is true that formal education is the space in which publicly accepted knowledge is presented and that both science and technology are present, it is also a space in which various skills and attitudes must be generated. that question the purpose of these large dimensions and their impact in real contexts.

Changing schools today has a lot to do with reviewing their relationships with science and technology. Educational transformation requires that we seriously ask ourselves how what happens in the world of science and technology affects what happens in school (Cullen, 2000, p.70).

Consequently "it is about, in the academic debate, asking ourselves about how to build socially and theoretically relevant knowledge, at the same time communicable and useful to the different agents involved, as well as to society as a whole" (Carrizo, s/ f, p.1). Educational institutions should no longer only train in knowledge for the sake of

knowledge itself, this assertion is no longer valid for the moment that humanity lives today, it is required, as Carrizo states, that knowledge be pertinent, relevant and transcendent. for the contribution to the development of social capital and the benefit of communities.

Public opinion is attentive to what the university institution does and says. Citizens are no longer oblivious to what happens in the "academic courts." It challenges, discusses, and assists in a leading way in these movements: the university classroom is projected into the social agora (Carrizo, s/f, p.1).

This projection of the university to the social agora allows establishing other relationships with those other spaces external to the classrooms from where knowledge makes sense, this being a catalyst for sustainable development, however, an important question arises within the institutions of Higher education, what capabilities become the scaffolding for a graduate of its educational spaces to respond pertinently to the demands that the context itself requires to achieve the suggested relevance? The answer is not simple, however, critical and reflective thinking becomes the common thread of this process between the university and society.

What constitutes reflective thinking is the active, persistent and careful examination of any belief or supposed form of knowledge in light of the foundations that support it and the conclusions to which it tends (Dewey 1989 p. 25).

Developing this type of thinking in students will strengthen their ability to establish a much deeper contact with everything that is presented to them and, therefore, establish much more reasoned actions. The important thing lies in one's ability to engage in a continuous search for the truth. For such action, it is necessary to establish processes that question the facts.

Reflection begins when we begin to ask ourselves about the veracity, about the value of any indication; when we try to prove its authenticity and see what guarantees there are that the existing data really point to the suggested idea, in such a way as to justify the acceptance of the latter (Dewey, 1989, p.27).

The conceptual proposal would be incomplete if it did not specifically focus on the potential imbued in local knowledge and local cultures, in order to reintroduce ancestral practices that are respectful of the resources that are free in the environment but that, we know very well, are not inexhaustible and suffer significant losses when the basic forms that give rise to their creation and conservation are lost, for example, deforestation and disappearance of the vegetal layer of forests destroy the permeability of the soil, accelerate runoff in the upper basins and They cause water scarcity in the middle and lower basins. Making rational and balanced use of forests guarantees the permanence of other associated resources in other areas and regions. The biocultural approach focuses on cultural forms and their impact on the conservation of natural resources.

Once the most outstanding conceptual elements have been raised and which will allow us to focus on the observation options, it is necessary to consider how we are going to collect information and what the most important stages are.

2. Methodology

With this project we will be able to carry out work that will delve into both outstanding aspects of local culture and its influence on the conservation of environmental redoubts, for this it is necessary for us to resort to both the identification of the contextual features of the locality in the which the diagnosis will be carried out prior to the preparation of the intervention project and the intervention itself.

The research we propose up to this point has an exploratory nature, which is defined as follows:

In this type of research, both qualitative and quantitative methods can be used. In the exploratory scope, the research is applied to phenomena that have not been previously investigated and there is an interest in examining their characteristics. (Ramos-Galarza, C, 2020, p. 2)

Its main objective is to capture a general perspective of the problem. It is normally carried out when the objective is to examine a research topic or problem that has not been previously studied or that has not been addressed previously. These studies identify potential relationships between variables and set the tone for subsequent, more rigorous research. They are much more flexible in their methodology compared to descriptive or explanatory studies, which are more structured and complex. They are also broader and more general than these other two types.

Exploratory studies serve to become familiar with a relatively unknown phenomenon. (Salinas and Cárdenas, 2009, p.60) Using statistical resources, the population context, natural and cultural features are illustrated through statistical data collected; Likewise, we do not rule out as a possibility that in the full development of the project the need to design a quantitative instrument for observation may arise. The diagnosis will be carried out through qualitative methodological resources, such as observation of the natural environment, recognition tours of natural and cultural resources, interviews with selected actors and holding workshops.

3. Objectives:

General Objectives: Articulate elements of community life with technical and technological processes that allow organizing participation both for the identification of sources and resources of the environment, water in particular, as well as community practices that lead to their preservation, through carrying out diagnoses of the situation that, in turn, provide the opportunity to collect information to design and execute intervention projects.

Specific objectives:

● Identify sources of water resources as well as the daily life and economic needs of the community, opportunities for development and social organization, working capital, through the diagnosis of the communities.
● Identify natural resources (forest, fauna, flora) as the community's natural wealth in order to work on their conservation.
● Identify symbolic elements of cultural life to link environmental care work with values and significant figures as sources of solidarity, reciprocity and trust, through ethnographic research.
● Preserve by developing or enhancing commitment, cooperation and collective and individual responsibility, through training and dialogue with members and local groups
● Promote community organization and interaction with state institutions so that the needs, problems and shortcomings of the community are part of the public agenda

4. Delimitation and context:

4.1 Geographic context

This section addresses the general geographical contextualization of the state of Tlaxcala, then the municipality of Tlaxco and, finally, the community of El Rosario, Tlaxco.

IMAGE. 1. Geographic location of the state of Tlaxcala and the municipality of Tlaxco Fountain. Recovered from Google. Illustrative image of the state of Tlaxcala and its municipalities.


The information included was recovered from the National Institute of Geography and Statistics and from the official website of the Government of Mexico.

The state of Tlaxcala occupies 0.2% of Mexico's land area, with an area of 4,060 square kilometers. Its extreme geographical coordinates are the following: to the north 19° 44',

to the south 19° 06' north latitude, Preeast 97° 38' and west 98° 43' west longitude of the Greenwich meridian. Located in the central - south - eastern part of the country, on the transverse neovolcanic axis, Tlaxcala is bordered to the north by the states of Hidalgo and Puebla, to the east and south by Puebla; and to the west with Puebla, México and Hidalgo.

In 2020, the population in Tlaxcala was 1,342,977 inhabitants (48.4% men and 51.6% women). Compared to 2010, the population in Tlaxcala grew by 14.8%, and ranks 28th nationally for its number of inhabitants, the same place as in 2010.
Below is a graph that establishes the population panorama by municipalities of the state of Tlaxcala.

Graph 1. Municipalities with the highest and lowest population
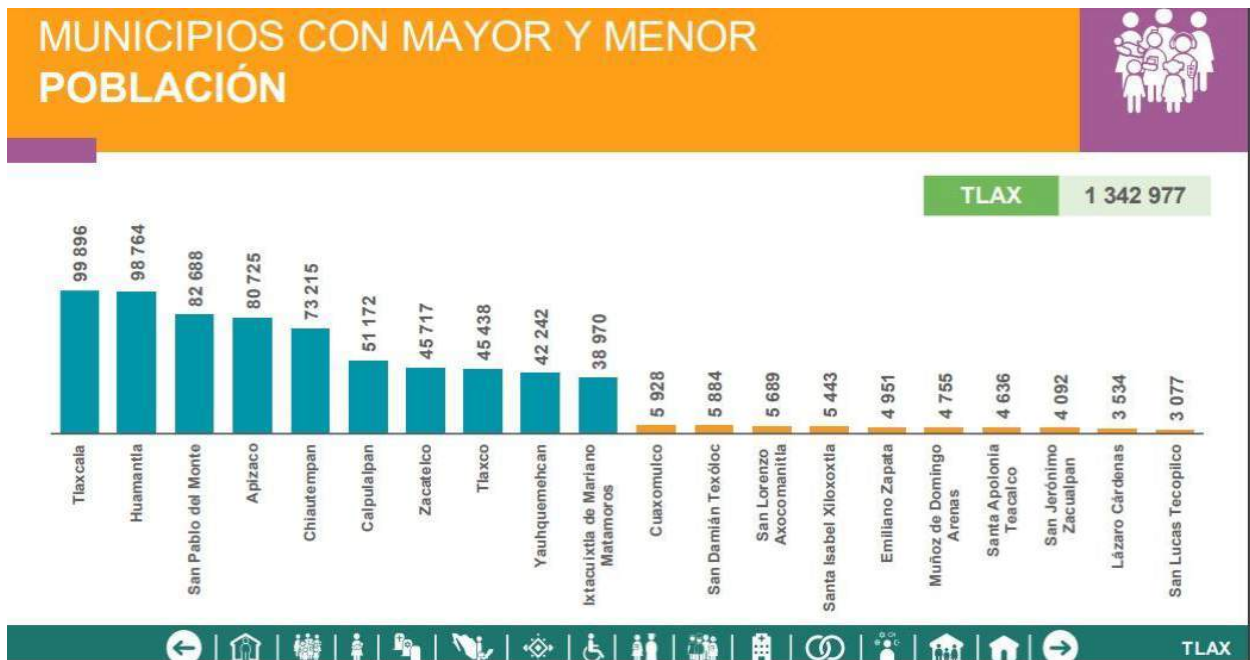
Source: INEGI (2020) presentation of results, Tlaxcala.

4.2 Flora and Fauna

Based on information recovered from the National Institute of Statistics and Geography (INEGI, 2020), the flora that predominates in the State are coniferous and oak forests. In the plains where the soils are not very humid there are bushes and grasslands and in the upper parts of the volcanoes, below the so-called "perpetual snows", which have now disappeared, the high mountain meadow is located; Agriculture occupies 74% of the state surface.

For its part, the fauna includes animals such as quail, squirrel, badger, salamander, tree frog, spotted opossum and bat. In the bush: black-tailed hare, hawk, coyote, white-winged dove, rabbit, cacomixtle, Skunk and rattlesnake. In aquatic environments: river frog and carp. Animal in danger of extinction: eagle.servar developing or enhancing commitment, cooperation and collective and individual responsibility, through training and dialogue with members and local groups to promote community organization and interaction with state institutions so that the needs, problems and shortcomings of the community are part of the public agenda.

Within its hydrography, the main rivers, lakes and dams of Tlaxcala are the following:
5 rivers: Atoyac (born from the melting of the Sierra Nevada in the state of Puebla, and enters Tlaxcala; then returns to Puebla territory to irrigate the extensive valley of Puebla-Tlaxcala), Zahuapan (tributary of the Atoyac), Xonecuila, Apulco and Altzayanca.

3 lakes: Jalnene, Zacatepec and Acuitlapilco.

2 dams: Atlangatepec and Lázaro Cárdenas.

4.3 Municipality of Tlaxco

Tlaxco is a typical city of Tlaxcala inhabited by Otomíes since the 14th century and obtained the status of municipality in 1866.
Extreme geographic coordinates: North 19°44\ south 19°31' north latitude; to the east 97*58' and to the west 98°23' longitude West.

This municipality borders to the north with the states of Hidalgo and Puebla; to the east with the state of Puebla and the municipalities of Terrenate and Tetla de la Solidaridad; to the south with the municipalities of Tetla de la Solidaridad, Atlangatepec, Domingo Arenas and Hueyotlipan; to the west with the municipalities of Hueyotlipan, Lázaro Cárdenas and the state of Hidalgo.
Based on INEGI microdata (2020), the total population of this municipality is 45,438 people, of which 23,361 are women and 22,077 are men. The total population of the municipality in 2010 was 39,939 people, representing 3.4% of the population in the state.

● In the same year there were 9,356 households in the municipality (3.4% of the total households in the entity), of which 2,018 were headed by female heads of family (3.3% of the total in the entity). The average size of households in the municipality was 4.3 members, and in the state the average size was 4.3 members.
The average educational level of the population aged 15 years or older in the municipality was 7.2 in 2010, compared to the average educational level of 8.8 in the entity.

In 2010, the municipality had 54 preschool schools (6.3% of the state total), 53 primary schools (6.7% of the total), 28 secondary schools (8%) and nine high schools (5.7%); a technical professional school (4.2%) and a work training school (1.1%). The municipality did not have any indigenous primary school. There were 18 medical units in the municipality (6.4% of the total medical units in the state). The medical staff was 95 people (3.4% of the total doctors in the entity) and the ratio of doctors per medical unit was 5.3 compared to 10 in the state.

By continental surface, the largest municipality is Tlaxco, which occupies 14.4% of the state surface.

3.3.1 El Rosario Community

The information collected from the community of El Rosario is developed below:

At an altitude of 2692 meters above sea level, the community of Rosario has a latitude of 19°39'29.454" N and a longitude of 98°13'41.868" W.

IMAGE. 2. Geographic delimitation of the community of Rosario, Tlaxco, state of Tlaxcala.
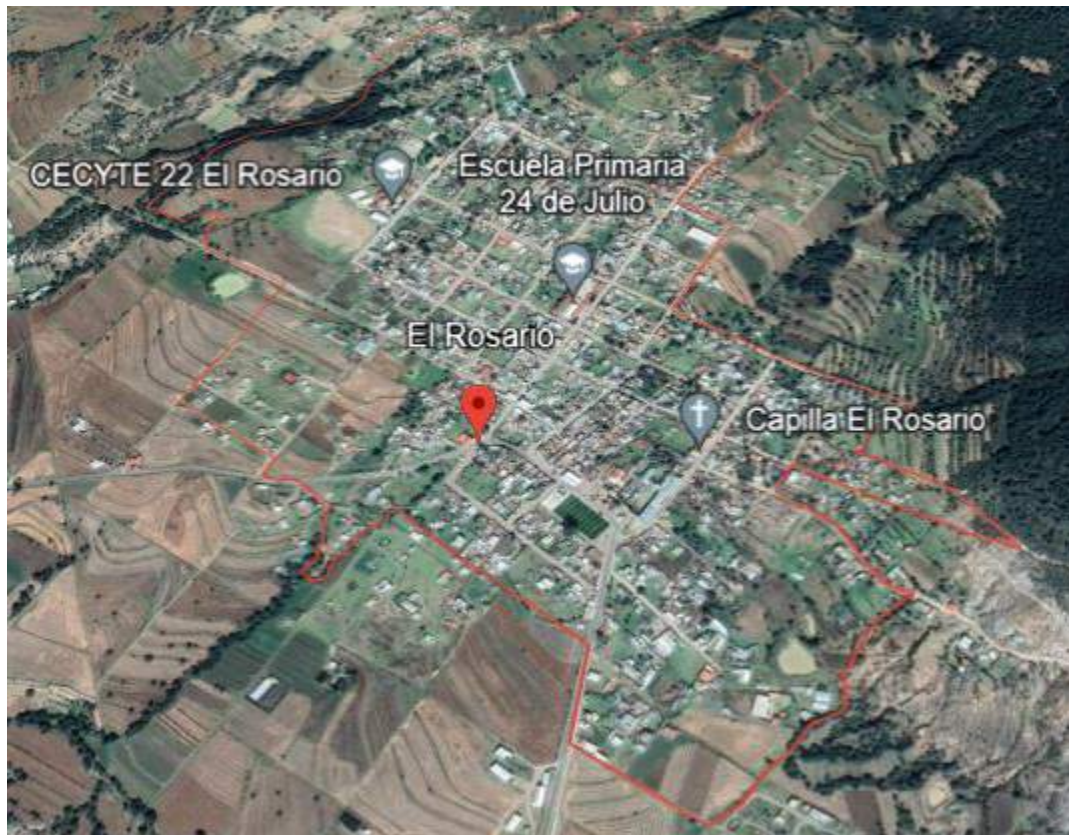
Source. Design in Google Earth of the geographical delimitation of the community of Rosario, Tlaxco.or of its hydrography, the main rivers, lakes and dams of Tlaxcala are the following:

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2 dams: Atlangatepec and Lázaro Cárdenas.

4.3 Municipality of Tlaxco

Tlaxco is a typical city of Tlaxcala inhabited by Otomíes since the 14th century and obtained the status of municipality in 1866.

Extreme geographic coordinates: North 19°44\ south 19°31' north latitude; to the east 97*58' and to the west 98°23' longitude West.

This municipality borders to the north with the states of Hidalgo and Puebla; to the east with the state of Puebla and the municipalities of Terrenate and Tetla de la Solidaridad; to the south with the municipalities of Tetla de la Solidaridad, Atlangatepec, Domingo Arenas and Hueyotlipan; to the west with the municipalities of Hueyotlipan, Lázaro Cárdenas and the state of Hidalgo.

Based on INEGI microdata (2020), the total population of this municipality is 45,438 people, of which 23,361 are women and 22,077 are men. The total population of the municipality in 2010 was 39,939 people, representing 3.4% of the population in the state.

● In the same year there were 9,356 households in the municipality (3.4% of the total households in the entity), of which 2,018 were headed by female heads of family (3.3% of the total in the entity). The average size of households in the municipality was 4.3 members, and in the state the average size was 4.3 members.

The average educational level of the population aged 15 years or older in the municipality was 7.2 in 2010, compared to the average educational level of 8.8 in the entity.

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