

Water Management and Governance in Yashanal and Tzajalchen, Tenejapa, Chiapas (2015-2020)

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To quote this article:

Girón Guzmán, C. M., & Oliva Velas, A. Gestión del Agua y Gobernanza en Yashanal y Tzajalchen, Tenejapa, Chiapas (2015-2020). *Espacio I+D, Innovación más Desarrollo*, 13(38). <https://doi.org/10.31644/IMASD.38.2024.a05>

— Abstract —

The use of water in Mexican towns for domestic, backyard and agricultural activities demands modern forms of governance according to the circumstances of each one. Therefore, this study analyzes the settlements of Yashanal and Tzajalchen, in the municipality of Tenejapa, Chiapas, with respect to their management of the resource coming from the spring located in the Yashana territory, sacred for the Mayan ancestors and of current community use, concretized with agreements that result in a viable structure for the beneficiaries. As noted, the differences block the distribution of the element.

Water is treated as a public good through the concepts of governance, community governance, actors and management, comparing how it is managed in the two settlements to evaluate the efficiency in the establishment of norms. The struggles between localities are analyzed, observing the behavior of public and private actors, whose decisions are complicated by the fact that they have not established rules of interaction due to cultural and organizational changes.

Keywords:

Governance; community governance; water management; Yashanal and Tzajalchen; Tenejapa; Chiapas

The use of natural resources is of interest to all societies and is an especially relevant issue in the municipalities of Chiapas. Water is essential for human survival, a promoter of development and sustainability in social, economic, and environmental ecosystems, and fundamental for health, productive activities, energy, education, and territorial projection. According to the National Water Commission ([CONAGUA], 2015):

In Mexico, water is recognized as a strategic and national security issue, today it has become a central element of environmental policy, and even more, a key factor of social development policy and economic policy; its availability conditions the possibility of development of some regions of the country and its quality is a determining factor for the health and well-being of the population (p. 4).

The access, supply, sanitation, use, and ownership of water require adequate management and administration, which is why management involves the participation of public and private actors, both at the local and federal levels, based on the consensus of the beneficiaries. Human rights, collective management, and governance are fundamental to ensure an equitable distribution of water among indigenous peoples, practicing norms and terms. This research examines how these practices develop in the two localities, compares their organization, and how local actors engage through social and power relations between the city and particular heterogeneous practices.

This article contains four sections. The first addresses the theoretical framework of the concepts of governance and community governance, analyzing the categories raised by Naser (2021), Raw (2005), Guy and Pierre (2005), Prats (2005), Rhodes (2005), World Bank (2022), and Shiva (2007) to link the two cases and explain the interaction of public and private agencies, as well as describe the geography of Yashanal and Tzajalchen. In the second, the work methodology is presented and details the distribution possibilities obtained in the field and cabinet work. In the third, the results and discussion are presented, where the actors involved, the community rules and the functions of the resource operators are shown; and finally, in the fourth, the conclusion.

THEORETICAL FRAMEWORK

Community Governance and Governance

Local development in the Yashanal and Tzajalchen communities of the municipality of Tenejapa is analyzed through the theoretical concepts of governance and community governance. In social research, the term gover-

nance is used to express conflicts in which private, public, and social actors intervene in the management of public affairs. According to the Royal Spanish Academy ([RAE], 1992) governance is "the art or way of governing that aims to achieve lasting economic, social, and institutional development, promoting a healthy balance between the State, civil society, and the market economy" (Rae, 1992, p. 8). For Naser (2021), governance is understood as:

The realization of relationships between various actors involved in the process of deciding, executing, and evaluating matters of public interest, a process that can be characterized by competition and cooperation where they coexist as possible rules; and that includes both formal and informal institutions (citizenship and its different mechanisms of temporary and/or spontaneous organization). The form and interaction between the various actors reflect the quality of the system and affect each of its components as well as the system as a whole (e.g. 14).

Governance means cooperation between public and private actors to deal with public affairs. It is also a social process in which authorities assume positions, interests, objectives, values, beliefs, or needs in a territory, which sometimes generates conflicts due to cultural, economic, social, and political factors. In addition, this concept applies to both public and private institutions. According to Raw (2005), the central government has lost the ability to govern and now acts as the one who authorizes interaction to resolve public affairs.

Governance presents a complicated situation, in modern society, the government remains responsible, but, in turn, is less able to act alone. It is interesting to see that the new governance, which displaces political power much more than the new governance does, does not have much difficulty in solving these problems. In the new public management, citizens can demand accountability through channels other than traditional ones; for example, through the free choice of the consumer or stakeholders (Guy & Pierre, 2005, p. 54).

Regarding the responsibilities assigned to the government in this process, Rhodes (2005) and Prats (2005) mentioned:

In a world where governance increasingly operates with less government involvement, where lines of authority are increasingly informal rather than formal, and where legitimacy is increasingly marked by ambiguity, citizens are increasingly able to defend themselves knowing when, where, and how to take part in collective action (Rhodes, 2005, p. 118).

The key to governance is to know how to organize a deliberative public space based on procedural rules that feedback and confidence in the structure of interdependence. Today we know that no one has enough knowledge to

unilaterally resolve complex issues. Aware of the limits of our knowledge, we know that we must interact to seek interim solutions following procedures that allow us to learn permanently and adapt to learning outcomes (Prats, 2005, p. 159).

Regarding water

This section analyzes how communities process the use of the resource, considering the degree of scarcity and the distance to the sources of the liquid. Governance appears when you try to improve the capacities of civil society through dialogue and practice of their rights, contributing to the construction, monitoring, and audit of public policies. Meaning conceptual alternatives. According to The World Bank (2022), it defined:

Impartial and transparent management of public affairs, through the creation of a system of rules accepted as constituting legitimate authority, to promote and value matters desired by individuals and groups (p. 18).

Shiva (2007) pointed out that water management appears as a social alternative when the inhabitants become actors in the process, that is, indigenous communities, peasant organizations, neighborhood groups in urban areas or civil society, recovering community practices or abiding by rules to meet the needs of the resource without the logic of corporate governance.

Geography of Yashanal and Tzajalchen

According to the National Institute of Statistics and Geography ([INEGI], 2020), in Chiapas there were 1,459,648 people over the age of three speaking the original language; where the Tseltals make up the largest group; secondly, the Tsotsiles; in third place, the Choles; and in fourth, the Tojolabales.

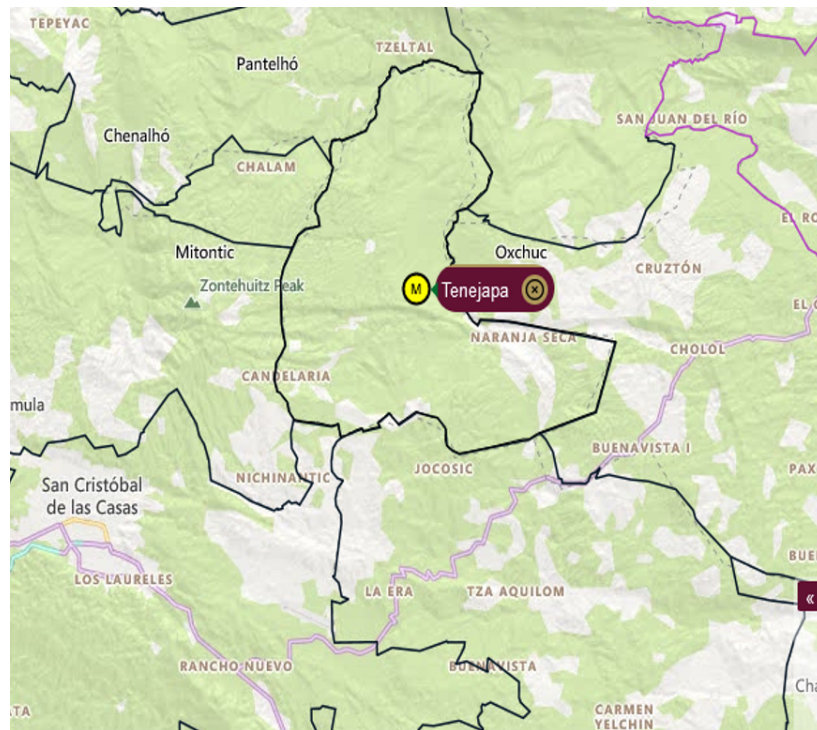
The original groups inhabit diverse biophysical environments that produce knowledge, customs, and beliefs. In this case, the main activity of the Tseltal communities is agriculture, although not as a main source of income, since seasonal wage labor is essential for the social reproduction of many families (Rodríguez, 2014, p. 92).

In Nahuatl, *Tenejapa* means "calcareous river", and in Tseltal it translates as *Tenel japa* (surrounded by mountains with a flat surface), according to the State Committee for Statistical and Geographical Information ([CEIEG], 2017).

The Population and Housing Census (2020) reported 48,162 inhabitants in the municipality; of which 51.6% are women, with 24,854; and 48.4% are men, that is 23,308. The most numerous age levels are 5 to 9 years (6,928), 0 to 4 years (6,606), and 10 to 14 years (6,403). These ranks make up 41.4% of the total.

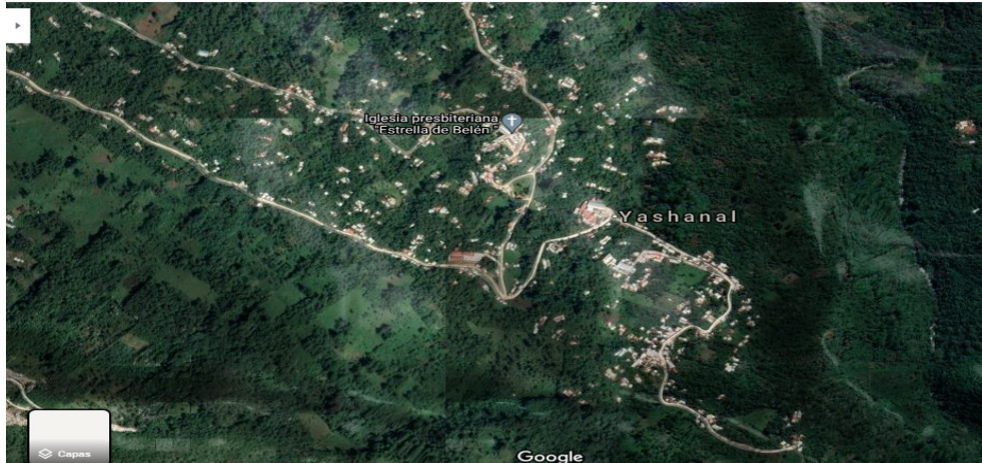
From San Cristóbal de Las Casas you can access Tenejapa by the state road and the branches to San Juan Cancuc and Oxchuc. Radio communication covers 66 localities and rural telephony has little availability, but satellite internet antennas connect them to the world.

Yashanal and Tzajalchen are located in the municipality of Tenejapa, as shown in Figures 1, 2, and 3. The first community has 2,125 inhabitants, occupying the fifth place in population among all the communities of the municipality, and is located at an altitude of 1,737 meters. The second has 2,962 inhabitants, is the second most populous community in the ranking, and is located at 1,556 meters high (CEIEG, 2017).



Note. Chiapas State Government Chiapas Geographic Map, 2022.

Figure 1. Location of the municipality of Tenejapa, Chiapas



Note. Taken from Google Earth. <https://windmap.gosur.com/es/mexico/?ll=16.825756305601118,92.45369804636493&z=15.455495555861784&t=satellite>

Figure 2. Overview of Yashanal, Tenejapa



Note. Taken from Google Earth. <https://windmap.gosur.com/es/mexico/?ll=16.841364731705752,92.46073129725983&z=15.568949024853994&t=satellite>.

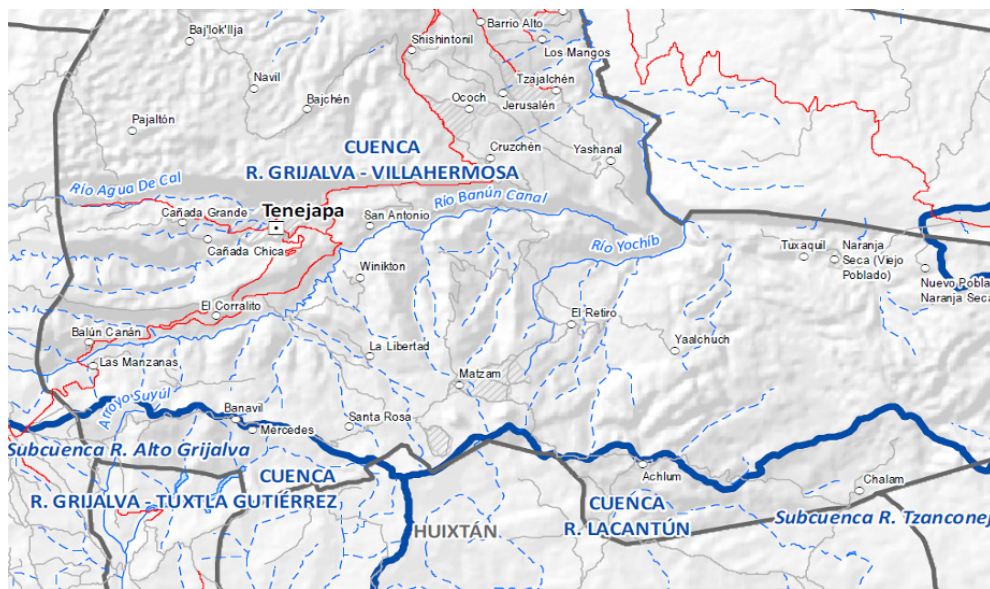
Figure 3. Overview of Tzajalchen, Tenejapa

Tenejapa is a traditional community where a high percentage of its inhabitants practice ancestral beliefs. As in other regions of the Chiapas Highlands, the office system plays an important role that gives prestige and social ranks.

Some people who have risen in religious political rank are called principals, and these people continue to have almost the same social roles, but yes, each administration is looking for a new position in the City Council because of the experience they already have. Usually, this group is made up of people of reasonable age and surround themselves with the cultural context of the

inhabitants of Tenejapa. The main ones constitute the most respected, consistent, and moral hierarchy group that acts as mediators when there are internal problems in the localities (CEIEG, 2017).

The municipality of Tenejapa is located between the sub-basins of the Chakté current, in the vicinity of the Grijalva river basin and the sub-basins of the Tzaconejá and the Azul, which flow into the Lacantún riverbed (Chiapas Geographical Map, 2021), as shown in Figure 4. Its tributaries are Jomanichim, Paktetón, Majosik, Tzajalchen, Yashanal, Río Banul Kanal, Río Agua de Cal, Arrollo Suyul, Los Chorros, Río Yaxgemel, and Yochi'b (San Juan Cancuc).



Note. Taken from the State Committee for Statistical and Geographical Information [CEIEG], Government of the State of Chiapas. Regional Maps, 2022.

Figure 4. Waterbodies in Tenejapa, Chiapas

A large area of the territory is located in the Grijalva drainage sub-basin, which feeds the tributaries to the Yochi'b River, on the limits between Oxchuc and San Juan Cancuc.

There are 715 inhabitants.¹ in Yashanal and 800 in Tzajalchen. Both have schools, a health home, and churches, being the communities with the largest infrastructures in the municipality. Four councilors make up the city council. In addition, they are conservative localities that inherit land only from men.

1 Cooperante: Persona con derecho a servicios como agua y luz, apoyos municipales y servicios comunitarios.

METHODOLOGY

The perspectives of the actors were investigated through qualitative research and direct observation in the area of the spring. Through field trips, it was verified that the communities organize themselves in community assemblies to choose their representative each year.

In February and March 2022, the drinking water committees interviewed a total of 15 people. In each community, 30 questionnaires were applied. Two field trips were made: one in the Yashanal basin; and another, in Tzajalchen, where pipes were observed crossing the lands of the inhabitants. A meeting with the Partido Verde committee was also scheduled. Ecologist from Mexico Tzajalchen. Key players in this community have been City Council officials, such as a young man who works at the Casa de la Cultura, who introduced us to those who could inform us about rules and mechanisms regarding water management.

The documentary research was based on the bibliographic review of academic foundations and statistical databases.

DISCUSSION AND RESULTS

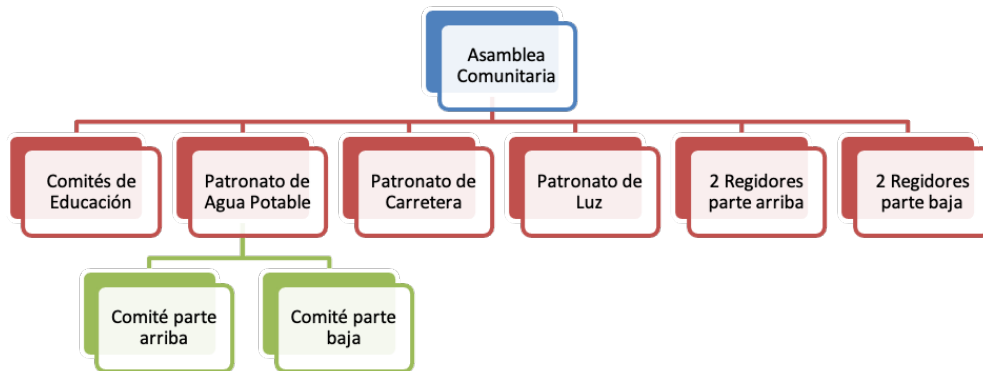
Participants in water management in Yashanal and Tzajalchen and levels of governance

In the towns of the municipality of Tenejapa, community assemblies are the highest authority, made up of cooperators who act as representatives of families, usually men, although female participation is increasing. This is how decisions are made on the issues that the community considers, analyzing the ideas. Ordinary meetings are held every two months. Whoever assumes the highest hierarchy as committee president, requires prestige and years of service to the community. Those who do not continue with their studies begin community work at age 12 and stop at age 50. The tasks of the Water Committee are to manage, maintain pipelines, inform, and organize the needs of users. The community assembly delegates management responsibilities to the Education Committee and the Drinking Water, Road, and Light boards, with specific tasks in services for the cooperators, such as connections to the electricity and water network systems, opening roads, and verifying liquid leaks in the network. All positions are temporary, usually with a duration of one year; and during their management, the person does not receive a salary, it is free community work. By assuming their functions as authorities, people abandon their economic activities and spend their savings or go into debt to support their families.

For this reason, the actions of the actors of the towns from 2015 to 2020 were analyzed. This period was chosen because there was a management that in the end became a dispute between both localities and state news. Through interviews with the authorities of Yashanal and Tzajalchen, the activities in water management were known, where the main sources are, the forms of distribution and organization, and the rules of use.

In Yashanal they are organized to deal with the access and maintenance of the spring, for which they build and preserve the hydraulic works. Each locality controls the resource according to the levels of organization. With the data collected from actors over the age of 60, stories were recreated about the study area to identify those who were members of the water committees, treasurers, and some who worked in the City Council.

Regarding the range of players, the practices, interests, and commitments of those involved in water management processes were considered. In Yashanal, a former municipal president and a former construction director, now a servant at the City Council, were interviewed. In Tzajalchen, key figures were identified, such as members of the National Action Party committee and an official from the Welfare Secretariat. These actors were asked what their sources of income are when they perform community service or public office. In this way, the actions of the two settlements regarding water management were analyzed. For example, in Yashanal every May 3, the authorities hold a Mayan ceremony to thank nature for the abundance of water. Thus, the role of each player in the cult was identified, as can be seen in Figure 5. Knowing the hydraulic infrastructure, it was verified that the houses have storage tanks.



Note. Based on direct observation.

Figure 5. Participants organization in Yashanal, Tenejapa

In Tzajalchen, six traditional councilors elected by the Community Assembly represent the population. Its Water Committee is composed of a president, a secretary, a treasurer, and four members. In the lands of the inhabitants, the pipes of the 17 communities pass through. To get to the spring, one needs to cross the settlement.

Upon assuming a position, relationships are established with the local, state, and federal levels to process economic resources and infrastructure. The identification of players aims to observe who is involved and identify their strategies, how they abide by and enforce the rules about use, rights, obligations, and application of fines and sanctions for not complying with them. Non-governmental organizations cease to be and do not act on the matter. According to users, they no longer care about creating alternatives to distribute and conserve the resource, since during the period analyzed there was no investment in this regard.

In this case study the resource is abundant, as the spring satisfies productive activities and human consumption, although access rights through inter- and intra-community negotiation processes are unstable, causing poor coordination and contention among the operating committees in the communities. Consensus is negotiated in an assembly with rules for efficient management.

The horizontal method of the actors is positive in the management of a public matter, in which transparency and accountability of those in charge condition the community decision. Good governance transforms the procedures for using a resource and meeting objectives through consensus among players toward appropriate management that will be passed on to future generations.

One of Tzajalchen's achievements was the completion of a project to modernize the potable water distribution system, which has been underway since 1998. To this end, the Tzajalchen committees went to Yashanal, where the spring is located, meeting with the community authorities and presidents of the Education, Drinking Water, and Road committees. Following customs and traditions, they carried soft drinks with Coca-Cola glass containers, bread, and pox. Once they met, they agreed to undertake the work in the spring, but Yashanal asked Tzajalchen to install a "three-phase" transformer to extend the distribution of energy because the intake is in their territory, which was denied because it would lower the power of the service in the houses of their community, undoing the approval.

The conflict worsened in Tzajalchen on November 26, 2015. The president of the Drinking Water Committee noticed at night that he had no liquid in his house. The next day he discovered that the people of Yashanal had cut off their supply, so he summoned all the inhabitants to an extraordinary meeting. The absent cooperant would be fined.

The issue occurred when Tzajalchen did not allow the extension of the network. In retaliation, Yashanal suspended their water supply for 20 days and Tzajalchen cut off their power and blocked the road so that they could not transport their products. The companies that supplied the small grocery stores could not enter.

On December 15, 2015, at 10:50 a.m., residents of Tzajalchen arrived at the municipal presidency and took two officials (councilor and liaison) to pressure the Partido Revolucionario Institucional (PRI) mayor to address the problem. The detainees were held at the community center.

The municipality sent pipes to Tzajalchen while the parties negotiated, but more than 800 cooperants (one per family) needed to be supplied. In Yashanal, primary and secondary school students were affected because classes were suspended, as teachers were unable to reach their work centers due to the road blockade. The community governance between the two localities could not find a solution and it was easy to blame the municipal and state authorities because there was a lot of tension after more than 20 days without drinking water and electricity.

The authorities of Tzajalchen were trying to solve the conflict peacefully, but as they saw no way out they called a press conference on December 17, 2015, setting an ultimatum to the government bodies of 24 hours to address the issue, arguing that in their territory pass the pipes of 17 other localities, including the municipality of San Juan Cancuc, and threatening to suspend drinking water.

After 20 days of water and electricity shortages, the public and private actors of both towns agreed that Yashanal would not extend its electricity system to its users and that Tzajalchen would have its water supply. There was multilevel governance of the institutions and the problem-solving capacity and legitimacy of each actor was noted. Once the conflict was resolved, Yashanal thought about how to modernize the electric power system so that coffee growers, balcony workers, carpenters, and those with nixtamal mills and grocery stores could work properly. In Jerusalem, a nearby community, it was agreed to extend the service.

Since pack animals and people were still being used for transportation to the roadside, the road from Yashanal to Naranja Seca was built to transport personnel, materials, and agricultural products in vehicles, as shown in Figure 6. The scarce participation of federal, state, and municipal actors in the management of public affairs left the task to the communities, but the alternatives were insufficient and provoked inter-community conflicts with the interference of churches and political parties.

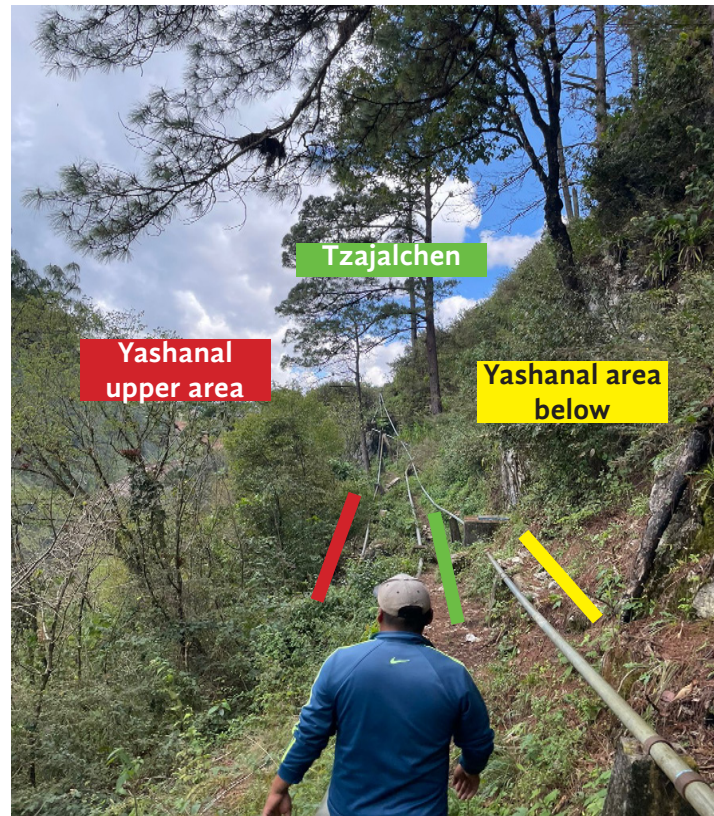


Note. Taken from Autónoma de Pedro Girón López, on February 18, 2022.

Figure 6. Road opening from Yashanal to Naranja Seca

As the spring is sacred to the communities, only people from the municipality and the drinking water committees can access the site. It is approximately 45 minutes away, on a muddy and rocky bridle path, and is difficult to travel in rainy weather.

There are three hydraulic lines, as shown in Figure 7.



Note. Taken by Carlos Manuel Girón Guzmán, Yashanal, Tenejapa, on February 18, 2022.

Figure 7. Description of case study pipelines

The one marked with a red arrow supplied Yashanal and Tzajalchen, but the fights caused the former to divide into two groups and the latter to determine its supply. The lack of coordination among the Water Committees led to problems, such as with the small works at the source. In a single line, it would be economical and the supervision and maintenance time would be reduced, but, as observed, they place concrete bases on the pipelines and mobilize more human resources for repairs. Water from the spring is conveyed by gravity through the slopes of the land, with an adequate flow and reducing costs. Inspection is required.

The spring flow *Bo't K'in Ja* of Yashanal connects with that of the Red River (*Tsajal Ukum*) at Yaalchuc. As shown in Figure 7, the liquid is taken from the source of the stream because it is cleaner. A member of the Water Committee pointed out strategic points in rivers and streams where they filled their amphorae to take to the houses, a task commonly done by women as a division of labor.

Later, a tank was built with concrete and stones to supply the houses of the two towns with a network of hoses, but the struggles between the

groups from the lower and upper parts of Yashanal and Tzajalchen caused the system to stop working. Next to that tank, there is another cylinder-shaped tank with a capacity of 5,000 liters donated in 2013 by Misión Integral para el Desarrollo de México, A. C., a civil organization whose purpose is to improve the living conditions and the environment of the neediest sectors in Los Altos de Chiapas. Erecting joint tanks and distribution systems caused problems between localities, although they had sufficient capacity to satisfy users.

According to the interviews, those who boil water consider that they affect nature because they consume more firewood and pollute, so sometimes, despite the risks, they choose not to do so because the process involves a high cost and they are aware that in the long term they will have health problems.

One question in the user questionnaire was: Is the water you drink treated? Most of them answered that they do not accept disinfection with chlorine because of the change in taste and odor, a matter for the institutions to attend to since they suffer from gastrointestinal infections due to drinking contaminated water. Many do not boil the water, arguing that it comes from the spring and its quality is very good. Interviewee 2, a member of the Water Committee, commented that the Secretariat of Social Development (Sedesol) used to train women in health and family planning, among other topics, but with the change of government the assistance disappeared and the work was abandoned.

The two localities have 24-hour access to the resource for consumption by backyard animals, family gardens, during the coffee harvesting season, and for basic family use. Septic tanks are available for sewage treatment. They have better services than other towns in the municipality due to the number of inhabitants and the management power of their community authorities. They are in short supply from February to May, but not very much. The supply is constant, although with low pressure due to the low capacity of the source. To solve this problem, they use plastic tanks or concrete tanks.

CONCLUSION

The federal, state, and municipal governments are not obligated to provide piped water to rural communities or to manage and modernize the systems. In this case, the populations studied resolve their needs through community organization, establishing informal rules for the disposal of the resource, and governance faces obstacles to achieving supply, especially when the sources are not in their territory because the communities recognize the spring as their property and not that of the nation, and access to its flow requires solid agreements.

The intervention of public actors is marginal in water management because CONAGUA cannot give away concessions. The state government has no budget for the service systems and the municipality, whose constitutional obligation is to set up the operating agencies, fails to perform this function in rural communities. The case study shows how, due to religious and political differences, the agreements to share the storage tanks that supplied the two communities did not come to fruition and three groups were formed to manage the service, complicating access to the spring, which requires permanent negotiation. The tanks stopped working and this affected drinking water users in the treatment, causing gastrointestinal infections, cholera, and salmonellosis.

Because of the division between the communities, public resources were wasted as the pipelines ceased to serve. Installing a water distribution system in each town was once again an expense for the users, disregarding the historical efforts of the cooperators in the foundation and maintenance of the network. Improving water governance is complex because it involves the participation of public and private actors, and communication, interests, and responsibilities are often unclear between government and local agencies, resulting in struggles over the management and use of the resource source.

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