

Water management and access to drinking water in Tabasco

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ABSTRACT: *The objective of this research is to analyze how water management has been in Tabasco for the achievement of the human right to water during the period from 2013 to 2018. The implemented method was explanatory by which it was possible to investigate how the process of management of the vital liquid and how it has been provided by the government of the state of Tabasco and the municipalities that oversee said service; Obtaining that there is a lack of management by the State as a lack of social participation for the supply of drinking water.*

KEYWORDS: *government, administration, right, south, water*

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I. INTRODUCTION

Tabasco is a federal entity located in the geographical south of the Mexican Republic that has a diversity of ecosystems that promote the development of flora and fauna in the region and its rivers make up a water network that feeds other states in the country. It has been established that this entity has a wealth of water that leads it to support various economic activities in the most important resource for human life: water.

Given the importance of this natural resource, various national and international legal instruments have been created that include water as a fundamental human right for the existence of people, which is why its guarantee and management emerges as a subject to observe and monitor. in all its aspects.

In this present article, general elements such as the natural and geographical composition of the state of Tabasco are analyzed to later start from the history of public water administration as a state and municipal service. The study of the main legal references regarding the management of resources is made to end with the approach of said management as a human right.

II. METHODOLOGY

For the objective of this article, the implemented method was explanatory by which it was possible to investigate how the process of management of the vital liquid and how it has been provided by the government of the state of Tabasco and the municipalities that oversee said service.

III. DISCUSSION

Geographical and demographic aspects

Location

The Tabasco territory is in the south of the country and has extreme geographic coordinates 18°39'03" to the north; to the south 17°15'03" north latitude; 90°59'15" west; and 94°07'48" west longitude. Its extension is 24,731 square kilometers and covers 1.3% of the national total. It borders to the north with the Gulf of Mexico and Campeche; to the east with Campeche and the Republic of Guatemala; to the south with Chiapas; and to the west with Veracruz de Ignacio de la Llave (INEGI, 2017). Villahermosa is the capital of the entity, which concentrates a large part of the population and the main industrial and commercial economic activities.

Climate

Tabasco has an annual rainfall of about 2,750 millimeters, most of the territory is part of the southern Gulf coastal plain region (García, 2013). The climate in Tabasco varies between "warm humid with rain all year round; Hot humid with abundant rains in summer and warm sub-humid with rains in summer" (INEGI, 2017,

25). With preponderance mostly at temperatures that exceed 30 degrees Celsius when it is hot season. During the cold seasons, the temperature is between 23 and 17 degrees Celsius.

Territorial division

Tabasco has 17 municipalities —Cárdenas, Comalcalco, Conduacán, Huimanguillo, Paraíso, Centro, Jalpa de Méndez, Nacajuca, Jalapa, Tacotalpa, Teapa, Centla, Jonuta, Macuspana, Balcan, Emiliano Zapata and Tenosique— and with two economic regions called Usumacinta and Grijalva, from which the Ríos subregion, Chontalpa subregion, Centro subregion, Pantanos subregion and the Sierra subregion emerge, thus covering all the municipalities of the entity.

Main economic activities

The classification of economic activities is primary, secondary, and tertiary. The primary is one that is dedicated to agriculture, livestock, forestry, hunting, and fishing; secondary is the one that is developed through construction, manufacturing industry and extractive industry and electricity; Finally, the tertiary is the one that deals with trade and other exchanges of goods and services (INEGI, 2017). In this sense, the Grijalva region supports its economy in the extraction of hydrocarbons, trade, and the provision of services; while the Usumacinta is dedicated to agriculture and livestock (OCapdepon & Marín, 2013).

In addition to the above, data published by the Ministry of Economy (SE) indicated that in 2017 the state Gross Domestic Product (GDP) represented 2.96% and was positioned in 13th place of the country's total. Likewise, he pointed out that among the main activities of economic spillover are oil mining with 52.4%; real estate services and rental of intangible personal property 7.7%; manufacture of products whose raw material is oil and coal; chemical, plastic and rubber industry 5.8%; retail trade 5.5%; and wholesale trade 4.4%. Which together represent 75.8% of GDP in the state (Secretaría de Economía, 2019).

Population

The growth of the population in Tabasco, as well as that of the country and the world, is part of a transformation process triggered by the development and consolidation of various elements such as the economy, the improvement of medical, educational, and food services, among others. The following table shows the dynamics of demographic increase that has occurred in the entity since 1990.




	1990	nineteen ninety five	2000	2005	2010	2015
 Men	750,305	872,243	934,515	977,785	1,100,758	1,171,592
 Women	750,878	876,526	957,314	1,012,184	1,137,845	1,223,680
 Total	1,501,183	1,748,769	1,891,829	1,989,969	2,238,603	2,395,272

Table 1. Tabasco Population

Distribution of water resources

a) *Hydrological regions, basins, and sub-basins*

Tabasco is one of the entities of the Mexican southeast with the greatest abundance of water resources, it is located in the Hydrological-Administrative Region "Frontera-Sur", which in turn is divided into the Hydrological Regions "RH 29 Coatzacoalcos" and "RH30 Grijalva- Usumacinta"; same that integrate four basins «Río Tonalá and Laguna del Carmen and Machona», «Río Usumacinta», «Laguna de Términos» and «Río Grijalva-Villahermosa». These have various sub-basins such as «Laguna del Carmen y Machona», «Río San Pedro», «Río San Pedro y San Pablo», «Río Chacamax», «Laguna de Pomi y Atasta » «Río Chumpán » «Río Grijalva», among others (INEGI 2017). Likewise, it has numerous surface water bodies and currents, and eight natural discharge aquifers –Huimanguillo, La Chontalpa, Samaria-Conduacán, Centla, La Sierra, Macuspana, Los Ríos, and Boca del Cerro–.

b) *Availability and use of water*

According to CONAGUA data, in Tabasco there is an estimate of 31,941 hm³/year cubic hectometres per year of renewable water; and an approximate of 13, 137 m³/inhab./year cubicle meters per inhabitant per year of renewable water per person; Likewise, it is estimated that by the year 2030 it will decrease to 11,885 m³/inhab./year. The uses of water resources in the entity are divided into self-supply industry with 17%; public supply 36%; and agriculture with 47%, the latter being the main consumer of water (CONAGUA, 2019).

Decentralization of the drinking water service

In article 65 of the Political Constitution of the Free and Sovereign State of Tabasco (2020), municipalities are empowered to carry out compliance with various public services, such as lighting, through the town halls; the cleaning, collection, transfer, treatment and disposal of its residual waters; the municipal and traffic preventive police; conditioning of streets, parks and gardens; traces; pantheons; markets and supply center; as well as the service of potable water, drainage, sewerage and the treatment and disposal of its residual waters. However, this was not always the case, because a process of decentralization of services related to drinking water was carried out; from being administered by the federation, they passed to the states, and these in turn to the municipalities, with the proviso that collaboration must be tripartite.

From centralism to decentralization

In order to better understand the functioning and operability of the drinking water service, it is necessary to do a bit of memory and historically contextualize how it has changed; since, from being a centralized service administered by the federation, it became a faculty whose compliance corresponds to the municipalities.

In 1948 the Secretariat of Hydraulic Resources (SRH) was the commissioner for the administration of the drinking water and sewerage systems in the country. On March 5, 1949, the regulations of the Federal Drinking Water and Sewerage Boards were published in the Official Gazette of the Federation (DOF) , thus giving way to the participation of the municipalities with the existence of operating agencies that were represented by the municipalities, although the federation was the one that controlled the rates and the administration of the entire system (CONAGUA, 2018).

The drinking water service had significant achievements in the fifties and sixties, obtaining by the seventies a coverage of 61% of the homes, this thanks to the credits of the National Mortgage Bank and Public Works -currently Banco Nacional of Public Works and Services-, investments from the SRH, and later loans from international organizations (Soares, 2007).

This centralist process was in force for almost three decades, until the SRH disappeared in 1976; this was due to the national introduction of urban development issues (Pineda, 2002). Therefore, in that same year, the functions of the SRH were distributed to the Secretary of Agriculture and Hydraulic Resources (SARH), and to the Secretary of Human Settlements and Public Works (SAHOP); the latter being in charge of dealing with matters related to drinking water and sewerage.

At the beginning of the eighties, the ability of the federal government to face the fulfillment of the service began to be questioned, this due to the economic crisis that the country was going through, together with the ineffectiveness of the potable water policy (Soares, 2007); This formed the perfect scenario that led the federation to the process of decentralization of services, ceding control and execution to the federal entities and in some cases to the municipalities, under certain operating standards that sought to achieve self-sufficiency.

This change formed a new perspective in the way of managing and administering water. From then on, the state governments created different operating organizations, some of which were municipal. The reform to constitutional article 115 of February 3, 1983, consummated decentralization at the legal level, by establishing that the municipalities oversaw the drinking water and sewage service, therefore, being a federal public service, it became state, and finally municipal.

The unification of services in Tabasco (1980-2012)

Because of the decentralization of water management, local governments found it necessary to issue legislative and administrative provisions to standardize the legal framework in accordance with the criteria established by the federation. In Tabasco, the first rapprochement took place under the administration of then-governor Leandro Roviroso Wade, on September 13, 1980, through the agreement by which the Tabasco State Drinking Water and Sewerage Services (SAPAET) body was created, published in supplement 3965 of the Official Newspaper of the State of Tabasco (POET). Among the functions that were conferred on it, the supply of drinking water to almost the entire territory of the state stands out; systems administration; planning to work with the federation and municipalities, among others (Government of the State of Tabasco, 1980).

Two years later, in April 1982, the Law for the Provision of Drinking Water, Drainage and Sewerage Services of the State of Tabasco was issued, published in decree 2155 of the POET, which unified the federal criteria for decentralization of services. This law contemplated the coordinated participation between the

municipalities and the state of Tabasco for the provision of services; Likewise, article 37 mentions for the only time the state agency called the Drinking Water and Sewerage System of the State of Tabasco, better known by its acronym SAPAET, whose legal status was not fully defined in the law.

In this sense, it was only empowered in a general way to carry out the "construction, rehabilitation, expansion, administration, operation, conservation and maintenance" (Government of the State of Tabasco, 1982, art. 37) of all the infrastructure of the systems of drinking water, desalinated water, drainage and sewerage, as well as the treatment of residual waters and the corresponding collection of each municipality. Although it is true, this precept points to joint work, it does not make the role that corresponds to each municipality entirely clear.

During the government of Roberto Madrazo Pintado, on January 10, 1998, supplement B 5775 was published in the POET, which contained the internal regulations of SAPAET, which in its first article established that it was a decentralized public body, with legal personality and own patrimony (Government of the State of Tabasco, 1998), sectorized to the Secretariat of Social Development and Environmental Protection (SEDESPA). This instrument indicates the functions of each of the administrative units that made up SAPAET.

One year later, through the agreement dated April 17 published in POET 5907, the legal nature of SAPAET changed, becoming a decentralized body, preserving its administrative affiliation to SEDESPA (Government of the State of Tabasco, 1999). On December 16, 2000, supplement 6081 was published in the POET, which issued a new internal regulation of SAPAET (2000), through which a new organic structure was established, and its functions were modified.

Twenty-three years after the promulgation of the first law regulating drinking water services, the Tabasco State Water Use Law (LUAET) was issued, which was published by decree 069 dated May 21, 2005, in the supplement 6543 C, of the POET, under the administration of then-governor Manuel Andrade Díaz, which has been reformed five times. This law has the particularity of not mentioning SAPAET, but a new figure that was the Water Institute of the State of Tabasco, of which there is no history of external regulation of operation, only that this order conferred powers like those it retained. SAPAET.

Continuing the mandate of Andrade Díaz, decree 220, dated December 16, 2006, was published in supplement 6707 C, of the POET, reforming the Organic Law of the Executive Power of the State, where in its article 35 a brief mention was made of the Institute of Water, in addition to passing the drinking water, drainage and sewerage services to the Secretariat of Settlement and Public Works (SAOP), which would be governed by the State Planning Law (2006).

In 2009, during the government of Andrés Rafael Granier Melo, SAPAET was resumed, issuing a third internal regulation, which restructured its functions. However, its validity was very short, since in that same year the LUAET (2009) was reformed by decree 204 in the supplement "L" of the POET, creating the State Water and Sanitation Commission (CEAS), with legal personality and own patrimony, which replaced SAPAET. In this sense, the first transitory of the reform declares the abrogation of decree 2155 relative to the first law related to drinking water, drainage and sewerage services of 1982, while the third transitory clearly states that the functions of the Services will be assumed by CEAS, among which are: the integration of the state water plan, the administration of waters under state jurisdiction, advising municipal and inter-municipal operating agencies, promoting a culture of water and monitoring accounts.

During the last year of Granier Melo's term, supplement 7242 B was published in the POET in February, which contained the regulations of the Water Use Law of the State of Tabasco. This ordinance consists of 83 provisions, which regulate specifications on the waters of local jurisdiction; Likewise, it regulates the operation and exercise of the CEAS, since this is the entity in charge of monitoring, executing, directing, and planning actions for potable water, drainage, sewerage, treatment and disposal of wastewater services. Finally, in November of that same year, in supplement G of POET 7325, the CEAS internal regulations were made known, and the SAPAET of 2009 was repealed.

The municipalization of services

a) Center, Tabasco

In 2001, the Honorable Constitutional City Council of the municipality of Centro, requested the head of the Executive of the government of the state of Tabasco, the transfer of drinking water, drainage, sewerage services, as well as the treatment and disposal of residual waters; request that was granted. Due to the foregoing, on May 3 of the same year, in supplement L of the POET, the agreement creating the decentralized body of the municipal public administration called the Water and Sanitation System (SAS) was published, to which the faculties such as establishing guidelines, criteria, norms for the provision of services; coordinate, plan, project and execute the works necessary for the provision of services; municipal water supply, among others (Ayuntamiento de Centro, 2003).

b) *Macuspana, Tabasco*

On October 15, 2005, the coordination agreement was published in the POET in which the state government transferred the drinking water, drainage, sewerage, treatment, and disposal of wastewater services to the municipality of Macuspana; this prior request made by the council through official letter 86/2004 dated January 10, 2004 (Government of the State of Tabasco 2005).

c) *Balancán, Tabasco*

On February 11, 2005, the Balancán City Council, through official letter PMB/044/2005, requested the head of the state's Executive Power to transfer the drinking water, drainage, sewerage, treatment, and disposal of its wastewater services; Official letter that was answered on May 2 of the same year with the transfer program, for which the coordination agreement for the transfer of state services to the municipality was signed (Government of the State of Tabasco, 2006).

d) *Jonuta, Tabasco*

In the same way, in 2013 the Jonuta City Council requested the state executive to transfer the services through official letter PMJ/146/2013, which was answered with its approval in July. Adding with this the decentralization of the service in four municipalities in charge of the CEAS (Government of the State of Tabasco, 2015).

Legal references in resource management

The National Water Law as a legal reference in the management of the resource

In Mexico, the National Water Law (LAN) regulating article 27 of the Political Constitution of the United Mexican States, published on December 1, 1992, in the DOF, whose last reform is from May 11, 2022; consists of 124 articles; whose provisions regulate the use, exploitation and exploitation of surface and groundwater belonging to the nation, as well as its distribution, control and preservation in quantity and quality.

It is important to emphasize the fourth article, empowering the Federal Executive Branch as the authority and administrator of national waters, as well as its public assets, with the proviso that it may exercise it directly or indirectly through CONAGUA.

In the LAN, CONAGUA is initially mentioned as responsible for enforcing the mandates delegated to it by the federal executive, which is conceived as a decentralized administrative body of the Ministry of the Environment and Natural Resources (AMBIENTE), with a double modality for the performance of its functions, one at the national level and the other at the Region-Hydrological-Administrative level. Likewise, it is pointed out that CONAGUA will be assisted by the Basin Organizations, which in turn will be supported by the Basin Councils, the latter would have Consultative Councils; these were established for better management of the integrated management of water resources in basins and hydrological regions.

Next, others such as the Mexican Institute of Water Technology are mentioned as a decentralized public agency of AMBIENTE, which focuses more on research, development, adaptation, and technology transfer for water conservation and rehabilitation. In matters of complaints and denunciations, the Federal Attorney for Environmental Protection (PROFEPA) is established.

In article 14 BIS 5, the principles by which the national water policy will be guided are established, among which the importance of the vital liquid as a public good stands out; watershed management; the participation of federal entities, municipalities and social sectors; conservation, preservation, protection and restoration of water in quantity and quality; economic generation of the use or exploitation of water resources; penalties for those who pollute water or misuse it; promotion of the culture of water and the preference always for urban domestic and public use over any other.

At the national level, there is the National Water Program, which oversees CONAGUA; water programs by hydrological basins; and the specific, regional, hydrological, aquifer, state and sectoral subprograms; and special emergency programs.

According to the LAN, it means the implementation of the resource in an activity that implies its use, either partially or totally. The law regulates the following: a) agricultural use: refers to the use of water in activities related to food production; b) environmental use: water as a preservative to maintain balance in the ecology; c) consumptive use: a certain volume of water that is used for a specific purpose; d) use in aquaculture: activities aimed at the controlled reproduction, pre-fattening and fattening of species of flora and fauna; e) industrial use: focused on the elaboration of materials that human beings demand for their development; f) livestock use: raising cattle and other farm animals; g) domestic use: it is the water destined to satisfy the needs of the home; and h) urban public use: use of water in population centers and human settlements through the municipal network.

As previously mentioned, urban public use has a preference for being the main agent for satisfying the basic needs of the population, in article 44 of the LAN, it is indicated that both the exploitation and the use or

exploitation of the resource are It will be carried out by means of an "assignment", which will subsist at all times, even when the drinking water service is provided by parastatal or paramunicipal entities.

In article 46 of the LAN (2020) it is determined that, by prior agreement or agreement with the federal entities, and these in turn with the municipalities, the collection, storage, conduction and treatment or purification for water supply.

Water Use Law of the State of Tabasco

The LUAET (2020) is made up of 117 articles, whose purpose is to promote the conservation, restoration, regulation and control of the waters belonging to the Tabasco territory. The interpretation, surveillance and application of its compliance is a power that must be exercised by the head of the Executive Power of the State, but which in turn will be delegated to the Ministry of Environment and Natural Resources.

a) Provision of public drinking water supply service

Article 8 of the LUAET establishes that this service can be provided by municipal, inter-municipal and regional operating organizations; likewise, by the CEAS; and by individuals, the latter if they have one or more previous contracts. In the case of operating agencies, they are configured as decentralized public entities, with legal personality and their own assets, and their administration, structure, and operation will be governed by the LUAET, its regulations, and other applicable provisions on the matter (LUAET 2020).

The operating agencies that are in charge of said service must carry out a) the studies, projects, budgets, constructions, rehabilitations, improvements, administration, operations and conservation of both the systems and those of purification, conduction, storage and distribution of water; b) provision of the service to all population centers of competent jurisdiction; c) integrate and update the user registry; d) previous study, proposal and approval by the State Congress, collect the rights and rates of the service; e) enter into contracts and agreements that contribute to the improvement of its activities; f) promote in users and in the rest of society a culture of water as an indispensable resource, this through the dissemination of its economic, social and environmental values that raise awareness of its importance; g) prepare, direct and monitor their work programs and annual budget; and h) create the pertinent programs to promote the efficient use of water.

Next, in article 18 of the LUAET, the causes for which the operating agencies may not provide the service are stated, as in the case that the State Congress declares that they lack both technical and human materials to carry it out. the efficient achievement of the service (LUAET 2020).

Forms of distribution of drinking water

If a piece of land is located or is located near water distribution pipes, the owners of the property, in order to have a drinking water service, must request it from the provider agency. In the cases of real estate such as condominiums, apartments, offices, businesses or shops, a socket and meter will be installed per user; and the contracts entered for the provision of the service must be approved by the Federal Consumer Attorney's Office. In each property there will be a water intake that will be independently and two discharge –wastewater and rainwater–, and for domestic users the agencies will install a register or well on their own (LUAET, 2020).

IV. FINDINGS

Accessibility to drinking water in Tabasco

Distribution of drinking water in 2010

Data from the 2010 Population and Housing Census provided information on the situation of Tabasco and its municipalities regarding the availability of water that was available. For the purposes of the census, the following indicators were applied:

Piped water inside the house. It considers homes in which the water comes from the public service network and the home has a system of pipes that reach the kitchen, toilet, bathroom or other similar facilities;

Piped water outside the house, but inside the land. When the water comes from the public service network, but the pipe only reaches a tap or faucet within the land occupied by the dwelling;

Piped water from a public key or hydrant. If the occupants supply themselves with water by carrying it from a public tap;

Piped water that they carry from another house. The occupants do not have piped water and, therefore, bring it from another house;

Pipe water. If the occupants are supplied with water through the service of a pipe (public or private). It is generally stored in cisterns, sinks, drums, buckets or other types of containers; and Water from a well, river, stream or other. If the occupants are supplied with water that comes from a well (own or community). When the occupants supply themselves with water by hauling it from the river, stream, lake, canal, dam, etc. (INEGI, 2013).

An estimated 558,882 inhabited private homes were distributed throughout the entity, with the municipalities of Centro, Cárdenas, Comalcalco, Huimanguillo and Macuspana concentrating more than 50% (354,157) of the total homes of the entity while the municipalities from Emiliano Zapata, Jonuta, Jalapa, Tacotalpa and Teapa had the least amount. Regarding the availability of piped water, only 7 of its 17 municipalities had a percentage higher than 80%, which were Emiliano Zapata (93.2%); Center (92.8%); Nacajuca (87.03%); Jonuta (85.01%); Tacotalpa (83.28%); Jalpa de Mendez (82.12%); and Paradise (80.92%). The rest is located above 30% and below 80%.

Regarding the totality of the entity, the distribution of piped water inside the dwelling was 290,531 (51.98%); and outside of it, but inside the land was approximately 120,028 (21.47%), thus obtaining 73.45% of piped water safely. The rest of the houses, some 148,323, obtained it by haulage in the following ways: 37,692 (6.74%) from some public key; 10,986 (1.96%) from another dwelling; 1,868 (0.33%) pipe; 95,411 (17.07%) from a well, river, stream or other. The last data of 2,366 (0.42%) of homes does not have precise information on how they access water.

	Intubated availability			Availability of water by haulage			
	Piped water inside the house	Piped water outside the house, but inside the land	Piped water from a public tap (or hydrant)	Piped water that they carry from another house	pipe water	Water from a well, river, lake, stream or other	not specified
Estimate of inhabited private homes with availability	290,531	120,028	37,692	10,986	1,868	95,411	2,366
	51.98%	21.47%	6.74%	1.96%	0.33%	17.07%	0.42%
Total	73.45%			26.52%			

Table 2. Total of entity 2010

How did Tabasco manage drinking water as it is a human right (2013-2018)?

The human right to drinking water is established with the characteristics of availability, accessibility, quality, safety, and admissibility and must be guaranteed for all people, citizens, moral subjects, peoples, and all forms of society of people so that they can live accordingly. in a fair manner, with development and in a democratic environment under the principles of dignity, equality and freedom (Islas Colín, 2021).

In addition to these principles, the public service must act under the principles of evolution, continuity and equality of public services with social content, that is, in which the State as a protective entity responds to social demands and needs through its public policies. and specific actions. Guaranteeing the human right to drinking water through public service allows, in turn, a dignified life under the assumptions of other economic, social and cultural rights (Islas & Cornelio 2022).

In the case of Tabasco, the right to access drinking water was incorporated in September 2013 shortly after its national recognition, at the beginning of the six-year term of Governor Arturo Núñez Jiménez. Article two, section XXXVII, states that every individual has the right to access, disposal and sanitation of drinking water for both personal and domestic consumption, under the characteristics of sufficiency, healthiness, acceptability, and affordability (Congress of Tabasco 2013). As a result of this pronouncement, problems related to water have acquired relevance in government work. In the State Development Plan 2013-2018, it was mentioned that:

Water is today a matter of national security and an essential element in all areas of human endeavor, a fundamental factor in achieving the sustainability of society. The current physical conditions of the piped water, drainage and sewage systems make it impossible to keep them in continuous operation. State coverage in drinking water service is 87.79%, in sewerage 55.63% and only 40% of wastewater treatment and sanitation is covered ((Government of the State of Tabasco, 2013).

Given the problems in question, the management of water resources for the supply of drinking water began to emerge, for this reason, goals related to the improvement of drinking water services in the entity, the

implementation of support and monitoring programs were set. to infrastructure maintenance, modernization of water treatment processes, technology implementation, among others ((Government of the State of Tabasco, 2013).

Following this position, the state government published in September 2014 the Special Program of the State Water and Sanitation Commission 2013-2018, which set out the guidelines that would guide the administration to expand the coverage of drinking water services, sewerage, drainage, and sanitation; this in accordance with the State and National Development Plan. Among the main public policies outlined are to extend the coverage of drinking water; rehabilitate, build, and improve the infrastructure of services; outline new financing projects to improve infrastructure; and the creation of a state public body for the benefit of the population (CEAS, 2014).

In the first government management report of Núñez Jiménez –2013–, in terms of drinking water, financial support was announced for the construction of drinking water systems in localities, although the scope of the population or under what conditions were not stated. enabled, likewise, economic allocations for programs and system maintenance are mentioned. The second report –2014– affirmed more construction of systems, greater federal and state economic contributions, and the process of transferring the public service to the municipality of Jonuta.

The 2015 Intercensal Survey released new data on the availability of piped water in the state and its municipalities. In this survey, a different criterion was applied to the 2010 Population and Housing Census, the main indicators were the same –piped water inside the house and outside the house, but inside the land– and the sub-indicators for both were "public service, community well, private well, pipe, another dwelling, another and unspecified place".

From this, it was obtained that the private homes inhabited in the municipalities of Centro (98.6%), Comalcalco (92.4%), Emiliano Zapata (97.2%), Jalpa de Méndez (91.0%), Jonuta (92.4%), Nacajuca (97.1%) and Tenosique (90.4%) have more than 90% availability of piped water inside the house and outside the house, but inside the land. On the contrary, Balancán(87.6%), Cárdenas (84.7%), Cunduacán (82.5%), Jalapa (88.7%), Macuspana (84.2%), Tacotalpa (89.0%) and Teapa (89.9%) are in a range greater than 80% and less than 90%.

	Municipalities	Estimate of inhabited private homes (646,448)	Estimate of water availability inside the house and outside the house, but inside the land	Estimated percentage of water inside the house and outside the house, but inside the land
1.	Balancán	17,156	15,028	87.6%
2.	Cárdenas	68,546	58,058	84.7%
3.	Centla	27,500	18,562	67.5%
4.	Centro	196,623	193,870	98.6%
5.	Comalcalco	51,994	48,042	92.4%
6.	Cunduacán	35,772	29,511	82.5%
7.	Emiliano Zapata	8,434	8,197	97.2%
8.	Huimanguillo	49,190	37,236	75.7%
9.	Jalapa	10,240	9,082	88.7%
10.	Jalpa De Mendez	21,740	19,783	91.0%
11.	Jonuta	8,577	7,925	92.4%
12.	Macuspana	43,764	36,849	84.2%
13.	Nacajuca	37,151	36,073	97.1%
14.	Paraiso	25,388	23,712	93.4%
15.	Tacotalpa	12,201	10,858	89.0%
16.	Teapa	15,282	13,738	89.9%
17.	Tenosique	16,890	15,268	90.4%

Table 3. Availability of municipal water

In relation to the total of the entity, the percentage of houses that had availability of piped water inside the house increased to 65.80% and that obtained outside the land in the perimeter of the house was 24.15%, leaving 10.04% (64,910) without knowing how they obtained it.

Indicators	Piped water inside the house		Piped water inside the house, but outside the land	
	Estimate of private homes	Percentage	Estimate of private homes	Percentage
Public service	425,406		156,132	
	365,934	86.02%	75,864	48.59%
community well	17,314	4.07%	18,251	11.69%
private well	39,392	9.26%	57,550	36.86%
Pipe	170	0.04%	140	0.09%
other housing	765	0.18%	2966	1.90%
Another place	382	0.09%	905	0.58%
not specified	1361	0.32%	437	0.28%
Entity Total		65.80%		24.15%

Approximately 64,910 (10.04%) of inhabited private homes do not have records of their availability to drinking water.

Table 4. Availability of drinking water in Tabasco

Through the government reports of 2015, 2016, 2017 and 2018, it is observed that the form of government water management of the previous ones was preserved; that is, the maintenance of works, infrastructure and budget allocations.

Main problems for the effectiveness of the human right to drinking water in Tabasco

In the 2013-2018 CEAS Special Program, a diagnosis was made on the main difficulties that caused the state to have problems distributing drinking water. Among them, they highlighted that one of the busiest is the control of water in the rainy season, because the misused surplus causes flooding that affects the hydraulic infrastructure –mostly occurs in the municipality of Centro– likewise, in dry seasons There is still damage due to not having enough water for collection and extraction (CEAS, 2013). Another point mentioned was the complexity of distributing drinking water in the different irregular population centers, since these have settled in sites considered to be at high risk due to the presence of flooding during the rainy seasons; Given this, there is a high cost for the maintenance of water systems.

Citizens have a deeply rooted "culture of non-payment", thus affecting the service innovation process. This data was also pointed out by the new administration of Adán Augusto López Hernández 2019-2024; In an interview on Telereportaje, the current director of CEAS, Armando Padilla Herrera, pointed out that close to 110,000 users who receive water, only 3,000 paid for it –during the administration of Núñez Jiménez–, resulting in a monetary deficit of more than 600 million of pesos. Thus, he also pointed out that CEAS needs some 688 million pesos for its operation, however, not even a third of the amount was being collected (Telereportaje, 2019). Despite this, a low rate of service to citizens is maintained, since only in Villahermosa is a lower rate paid per cubic meter compared to other states –87 cents–, however, 75 percent of its inhabitants do not pay the drinking water; this as reported by the municipal council itself (Novedades de Tabasco. 2019).

In this sense, Padilla Herrera also indicated that there are areas where settlements were formed –such as the case of the Pomoca housing complex, located in the municipality of Nacajuca– in which at first it was estimated that some 5,000 homes would be housed, but to date It has exceeded that number, being about 15,000 homes between houses and apartments; Therefore, there is a problem of urban planning on the part of the municipal authorities in charge of planning the distribution of housing and the provision of basic services.

It is also important to mention that the abandonment by the authorities in charge of sustaining the infrastructure adds to one more cause of the difficulties for the effectiveness of the human right to water. The coordination of the SAS of the municipality of Centro explained that during the past three-year period (2016-2018) no type of maintenance was given to the water systems, therefore the 18 water treatment plants as well as the 22 wastewater treatment plants they were in very poor condition, which require an estimate of between 10 and 15 million pesos for their maintenance every three years (Novedades de Tabasco, 2018); this caused about 4,200 cubic meters of mud. Among other points, the SAS exposed the same that there are 82subsidences and around 300 leaks, deteriorating grilles and dozens of manholes without covers (Telerreportaje, 2018).

In addition to the above, part of the Tabasco population lacks a culture for the care and preservation of water, which has had the consequence that the resource is wasted indiscriminately. In this regard, the authorities do not promote rational use of water, policies aimed at raising awareness among the population have been limited, little is known about campaigns on care or efficient management in homes, schools, or workplaces. Paraphrasing Denise Soares, it is important that the State focuses on social participation, in other words, the population is required to raise awareness about water preservation, but approach strategies must be established where people with disabilities are involved. the resource. It must know what people think of water, how they perceive it, what their needs are; Hence, proposing strategies to change behaviors and formalize good practices of use (Soares 2012, p. 101).

Regarding the regulatory issue in the state, the laws are not clear in defining responsibilities in the corresponding authorities that oversee the distribution of the resource, that is, it is said that it must be provided, but not what happens if it stops supplying water or if it lacks being consumable.

V. CONCLUSION

Water is a human right recognized in the fourth article, sixth paragraph of the Constitution, this right is configured through a public service that was originally provided by the federation and that after a long history fell into a management obligation that the municipalities had to comply with, with the participation of the federation and the federal entities.

In the case of the state of Tabasco, drinking water services have not been approved, since they are provided indistinctly in some cases by the municipalities, and in others through the operating agency called CEAS. In this regard, of the 17 municipalities of the state, only 4 have decentralized the services, although it is necessary to specify that there is no attached regulation that governs their actions regarding the administration of the resource. For its part, the CEAS adheres to the provisions of its short regulatory framework, mainly through the LUAET, although this is limited as regards the issue of water resource management.

Tabasco, despite being a state with a preponderant water abundance and one of the main territories with the highest annual rainfall, does not have a consolidated water management structure. The foregoing can be verified because, according to data provided by INEGI, there is a considerable percentage of the population that lacks the service safely —this without mentioning that those who have the resource do not always have quality.

In addition to this, it is important to specify that social problems are added around this. Although it is true, the State is the main guarantor entity in society, the participation of the community is important; One of the main causes has been the " culture of non-payment for water " , because it is believed that the hydrological wealth of the entity does not deserve to be remunerated, in this way there is no money to maintain the infrastructures, and another no less important It is the lack of a culture of water, which causes the waste of the vital liquid.

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