

IMPACT OF STRATEGIC PLANNING ON THE MANAGEMENT OF WATER UTILITY OPERATORS (OOA) IN MEXICO

IMPACTO DO PLANEJAMENTO ESTRATÉGICO NA GESTÃO DOS ORGANISMOS OPERADORES DE ÁGUA (OOA) NO MÉXICO

IMPACTO DE LA PLANEACIÓN ESTRATÉGICA EN LA GESTIÓN DE LOS ORGANISMOS OPERADORES DE AGUA (OOA) EN MÉXICO



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ABSTRACT

This study analyzes the impact of strategic planning on the management of Water Utilities (WU) in Mexico and its importance for improving operational and financial efficiency, as well as the sustainability of the service. Through the application of an instrument to 21 WU in the state of Sonora and other states, a significant association was identified between the size of the WU and the adoption of strategic tools ($p < 0.05$). Thirty-three percent lack formal planning processes, and only 10% have a documented plan. WU management is primarily focused on short-term operations (43%) and sustaining daily operations (62%), with little emphasis on long-term projects (14%). A flexible planning model, adapted to the heterogeneity of the Mexican water context, is proposed to support decision-making and contribute to improving institutional performance with a focus on sustainable development.

Keywords: Water Utility (WU). Strategic Planning. Performance Institutional. Public Management. Sustainability. México.

RESUMO

O estudo analisa o impacto do planejamento estratégico na gestão dos Organismos Operadores de Água (OOA) no México e sua importância para melhorar a eficiência operacional, financeira e a sustentabilidade do serviço. A partir da aplicação de um instrumento a 21 OOA do estado de Sonora e de outras entidades, identificou-se uma associação significativa entre o porte dos OOA e a adoção de ferramentas estratégicas ($p < 0,05$). Constatou-se que 33% carecem de processos formais de planejamento e apenas 10% possuem um plano documentado. A gestão dos OOA orienta-se principalmente para operações de curto prazo (43%) e para a manutenção das operações diárias (62%), com pouca projeção para projetos de longo prazo (14%). Propõe-se um modelo flexível de planejamento, adaptado à heterogeneidade do contexto hídrico mexicano, que apoie a tomada de decisões e contribua para a melhoria do desempenho institucional, com enfoque no desenvolvimento sustentável.

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Palavras-chave: Organismo Operador de Água (OOA). Planejamento Estratégico. Desempenho Institucional. Gestão Pública. Sustentabilidade. México.

RESUMEN

El estudio analiza el impacto de la planeación estratégica en la gestión de los Organismos Operadores de Agua (OOA) en México y su importancia para mejorar la eficiencia operativa, financiera y la sostenibilidad del servicio. A partir de la aplicación de un instrumento a 21 OOA del estado de Sonora y otras entidades, se identificó una asociación significativa entre el tamaño de los OOA y la adopción de herramientas estratégicas ($p < 0.05$). El 33% carece de procesos formales de planeación y únicamente el 10% tiene un plan documentado. La gestión de los OOA se orienta principalmente a operaciones del corto plazo (43%) y a sostener operaciones diarias (62%), con poca proyección hacia proyectos de largo plazo (14%). Se propone un modelo flexible de planeación adaptado a la heterogeneidad del contexto hídrico mexicano que apoye la toma de decisiones y contribuya a mejorar el desempeño institucional con enfoque en el desarrollo sustentable.

Palabras clave: Organismo Operador de Agua (OOA). Planeación Estratégica. Desempeño Institucional. Gestión Pública. Sostenibilidad. México.

1 INTRODUCTION

This paper analyzes the impact of strategic planning on the management of Water Operating Agencies (OOAs) in Mexico, institutions in charge of managing drinking water, sewerage and sanitation services. Most of the OOAs are in charge of the municipality (paramunicipal), the state through boards or commissions (state) and to a lesser extent private companies. These organizations face significant challenges derived from water scarcity, climate change, obsolescence of infrastructure and lack of long-term planning. The purpose of the study is to identify the level of strategic planning existing in 21 WOOs; 11 from the state of Sonora and 10 from other entities in Mexico, to estimate their relationship with operational, financial, and institutional performance, in order to promote a flexible model that strengthens the efficiency and sustainability of services (CONAGUA, 2024). (Camacho González et al., 2024)

The background shows that at the global level, water resources are facing increasing pressure due to increased consumption and the effects of climate change. According to UNESCO (2025), the agricultural sector accounts for 72% of water withdrawals, followed by industry (15%) and domestic use (13%), while more than 2,200 million people lack access to safely managed water services. In Mexico, approximately 4.5 million people (3.9%) do not have a formal drinking water service, a situation that is aggravated by the overexploitation of aquifers and the deficiency in distribution systems (CONAGUA, 2024), especially in northern Mexico, where the semi-desert climate aggravates the situation.

In this context, the current state of the problem reflects that the WOs have low levels of performance, deficiencies in administrative and financial management, and weak institutional sustainability (Reyes, 2023). Recent studies indicate that these organizations face a series of structural limitations, including: constant turnover of managers with each change of government, unqualified personnel, insufficient rates, inefficiency in collection, lack of infrastructure maintenance, absence of long-term planning, and boards of directors with a low degree of professionalization (Camacho González et al., 2024). These factors have a negative impact on the efficiency of services and on public confidence.

There are a variety of studies that address the performance of water operators in both developed and developing countries. The most commonly used techniques to make the comparison are non-parametric, while the Data Envelopment Analysis (DEA) model is the most widely used. The authors who have carried out comparative performance analyses include different variables: traditional, quality of service and the human right to water. The DEA technique is a generalized method for evaluating the efficiency of water companies. According to Cetrulo (2020), care must be taken in the application of this type of model in

developing countries since in most cases they only focus on financial volumes and costs, and leave aside other essential variables such as the human right to water, losses, quality of service and water quality. in accordance with Sustainable Development Goal Six (SDG) that promotes the right to clean water and sanitation (United Nations, 2020). (Ablanedo-Rosas et al., 2020; Cetrulo et al., 2020)

Several international studies support the usefulness of strategic planning in the public sector, for example, Vandersmissen et al. (2024) demonstrated a positive association between PE and the perception of performance of both managers and citizens in European municipalities, while Johnsen (2021) who conducted a linear regression study in 128 municipalities in Norway to investigate the relationship between how municipal managers perceive the usefulness of PE In their organizations, it was found that it is conceived as more useful when it is carried out voluntarily and is integrated into existing management processes and not when it depends exclusively on mandatory documents, that is, it was concluded that formal planning is more effective when it is voluntarily integrated into existing management processes. Similarly, in a study carried out in the period from 2007 to 2021, a systematic review was carried out to identify the PE tools used by companies and categorize them according to the type of industry. The analysis focuses only on commercial enterprises, so it invites academics to investigate it in other contexts. Among the 10 most used tools were the following: Porter's 5 Forces Analysis, Customer Satisfaction Analysis, PEST Analysis, SWOT Analysis, Competitor Analysis, Balanced Scorecard Analysis, TQM, CRM and Benchmarking. (Altwaijri & Alhomedan, 2025)

There are other articles that explore the importance of EP tools in the performance of public institutions, such as evaluating and analyzing the official strategic plans of the 66 most populous Canadian municipalities, using a comprehensive set of 30 indicators. It also mentions that local governments are increasingly using strategic planning as a tool to anticipate and address the complex challenges they face. It also defines EP as " Guyadeen et al. (2023) *the process of establishing long-term objectives, prioritizing actions to achieve them, and mobilizing human and financial resources to execute them.*"

Strategic planning (SP) is an essential tool for public organizations, since it guides decision-making towards the fulfillment of medium and long-term institutional objectives. According to Chiavenato (2021), the strategic plan allows for the definition of specific lines of action, assigned resources, and execution periods, contributing to the link between the opportunities of the environment and the internal capabilities of the organization. Its application in OUs favors the alignment of resources with operational objectives, the

improvement of performance and the sustainability of the service (Pari Llanos & Díaz Flores, 2024).

2 RESEARCH PROBLEM

In Mexico, municipalities are responsible for the administration of water services, in accordance with Article 115 of the Political Constitution, generally through municipal, intermunicipal, or state public OOAs (CONAGUA, 2024). However, the lack of institutional continuity and weak strategic culture limit the ability of these organizations to offer efficient and sustainable services (Hernández, 2022).

The supply of drinking water in Mexico is in charge of 2,826 OOA (INEGI, 2020) of which 1,642 provide the service to urban populations and 1,184 to both urban and rural populations. From a legal point of view, 2,613 correspond to the category of public sector services; 108 correspond to civil associations and 105 operate as a commercial company, cooperative or other category. In Mexico, the average expenditure per inhabitant per day is 300 liters, and increases to 500 liters per inhabitant per day due to leaks in the supply and distribution network caused by obsolete infrastructure (FCEA, 2020).

In contrast, in the state of Sonora there are a total of 47 OOAs, of which 16 are considered small (less than 3,300 users), 21 medium (3,300-100,000) and 10 large (greater than 100,000), according to the USEPA classification criteria that takes into consideration the size of the population served (Haider et al., 2014). In Sonora, all the OOAs are decentralized public entities that are mostly in charge of the municipality, only Cananea, Guaymas, San Carlos, Empalme and Vicam are in charge of the State Water Commission of Sonora (CEA, 2022).

According to Camacho González et al (2024), the best performing OOA in Mexico are; The Monterrey Water and Drainage System, the State Public Services Commissions of Tijuana, Aguascalientes and León, and the Intermunicipal Water and Sewerage System of the Guadalajara Metropolitan Area, although it does not mention what the criteria are to determine performance.

Given this panorama, the general objective of this paper is to analyze the magnitude and impact of strategic planning tools on the performance of municipal WOs in the State of Sonora, Mexico. In particular, it seeks: a) to generate a diagnosis of the level of planning of the municipal OOA agencies; b) evaluate the adoption of some strategic planning principles according to David and David (2017): strategy formulation; vision, mission and objectives; c) implementation of strategies: SWOT, Benchmarking, investments.

With this, the study aims to provide empirical evidence and a methodological proposal that strengthen the institutional management of the WOs, promoting a more efficient, transparent and sustainable development-oriented water administration.

3 MATERIALS AND METHODS

3.1 DESIGN

The research adopts a mixed approach, with a predominance of descriptive quantity and qualitative components of contextual interpretation. A non-probabilistic convenience sampling and an exploratory cross-sectional design were carried out (Hernández & Mendoza, 2018).

- A structured questionnaire was applied to managers of the WOs in the period 2020-2022
- Frequencies, relationships and levels of significance were obtained from the questionnaire.
- Statistical contrasts between the surveyed OOA are reported

3.2 REGION OF STUDY

The study region focuses on 9 states of Mexico: Sonora, Mexico City (CDMX), Nuevo León (Monterrey), Coahuila (Saltillo), Jalisco, Sinaloa (Culiacán), Baja California Norte (Mexicali), Zacatecas (Escobedo), Michoacán (Morelia and Quiroga) and Guanajuato (Guanajuato). The selection of the OOA was made taking into account their level of performance.

The unit of analysis consisted of eleven WOs from Sonora (Hermosillo, Cajeme, San Luis Rio Colorado, Huatabampo, Guaymas, Navojoa, Agua Prieta, Caborca, Puerto Peñasco, Empalme and Cananea) and ten from other entities in the country (Mexico City, Baja California, Zacatecas, Nuevo León, Jalisco, Sinaloa, Guanajuato, Michoacán and Coahuila) in charge of drinking water supply, sewerage and sanitation (Table 1). The OOA of other municipalities in the country that were considered in the study are also indicated. All the OOAs considered in Sonora are of the paramunicipal type, with the exception of the municipalities of Cananea, Empalme and Guaymas, which are of the state type, that is, they are administered by the government of the state of Sonora.

The universe of the surveyed AOA (Table 1) clearly shows their heterogeneity, this variability justifies the differentiating treatment in the analysis, since the planning and resources will have different impacts according to the scale of the organization. Small service providers (Quiroga) are observed to large systems such as SACM and Monterrey. According

to the heterogeneity of the OOAs, strategic planning practices may depend strongly on the scale of the service, such as technical and financial capacity, and human resources.

Table 1

Water Operating Bodies Analyzed

Region	Region of study	OOA	Number of connections
North	Baja California	CESPM	352,135
		Agua Prieta	26,741
		Caborca	22,608
		Shut me up	134,929
		Canaanite	11,476
		Splicing	17,048
	Sonora	Guaymas	38,944
		Hermosillo	275,549
		Navojoa	41,224
		Huatabampo	54,738
		Boulder	19,710
		St. Louis	72,546
West	Coahuila	Saltillo	260,598
	Nuevo León	Monterrey (SADM)	1,710,206
	Sinaloa	Culiacán	332,981
Center	Jalisco	SIAPA	1,223,615
	Michoacán	Morelia	246,898
		Quiroga	6,040
Center	Zacatecas	Escobedo	1,976
	Guanajuato	Guanajuato	40,680
	Mexico City	SACMEX	4.5 million

Note: Prepared with data obtained from the survey. OOA= Water Operating Bodies.

The distributions of the size of the OOA service both in Sonora (Hermosillo and Cajeme) and in the other municipalities of the country (Monterrey, Jalisco and Nuevo León) present large service providers and others of smaller size such as Cananea and empalme.

3.3 STUDY SUBJECTS

The study subjects were the directors, administrators and personnel in charge of the commercial and operational area of the 21 OUs contacted, most of whom work as directors or coordinators.

3.4 SIZE OF THE UNIVERSE AND SAMPLE SIZE

The universe is composed of all municipal OOAs in Mexico, which operate at the state and municipal levels. According to data from the National Water Commission (CONAGUA), there are 2,826 operating agencies in the country (INEGI 2020), with variations in their structure and efficiency.

For convenience sampling, those organizations that were accessible and representative in terms of management diversity and size were selected, considering aspects such as:

- Geographical region (north, center, south of the country).
- Management model (public, mixed, concessioned).
- Size of the organism (large cities vs. small municipalities).

Due to the nature of the sampling and the size of the sample, the results are not statistically generalizable, but they do allow us to establish useful interpretative patterns for the formulation of management proposals.

The unit of analysis consisted of 21 directors of the OOA (Table 2), 11 representative of Sonora, and 10 from other states (outside of Sonora). The management model considered was the public one, made up of 6 state and 15 paramunicipal OOAs. State WOOs are those that are administered by local boards or state commissions. On the other hand, the paramunicipal workers are the ones who are in charge of the municipality. This confirms that the sample is intentional and non-probabilistic, which limits the statistical generalization of the results, but allows for a deep contextual diagnosis.

Table 2

Analysis Unit Features by Organism Type and Location

Variable	Unit of analysis	%
Type of organization — Paramunicipal	15	71
Type of agency — State	6	29
Total by type of organism	21	100
Location — Outside of Sonora	10	48
Location — Sonora	11	52
Total by Location	21	100

Note: Prepared with the data obtained from the survey.

3.5 TYPE OF SAMPLING

The type of sampling was non-probabilistic for convenience, also called intentional or directed sampling (Hernández, 2021). Those that best represent the diversity of management

and efficiency in the country were selected, as well as their geographical location, management model, size of the agency and availability of information.

3.6 PRIMARY INFORMATION COLLECTION INSTRUMENT

For the collection of primary information, a survey was used that was applied in the period from 2020 to 2022, because in most cases it was necessary to resort to national transparency platforms to obtain the information since directly in the OOA they did not want to provide it in most cases.

The survey is made up of three sections that are described in a general way below:

- a) **demographic information** of the respondent (general and contact details of the interviewee), general information of the OOA (name, address, telephone numbers, number of taps attended, cubic meters billed, number of employees and type of organization);
- b) adoption of some strategic planning principles according to David and David (2017): formulation of strategies: vision, mission, objectives;
- c) implementation of strategies (SWOT, benchmarking, investments).

The data collection instrument was semi-structured, consisting of 20 items with a type of response: dichotomous that only have two response options (Yes/No), which allows identifying the presence or absence of practices and structures related to strategic planning. Secondly, multiple-choice questions are incorporated in order to characterize processes, those responsible and technical elements linked to planning. Finally, five-level Likert-type response types are used, aimed at measuring the frequency or degree of application of certain actions, with options ranging from "Never" = 1 to "Always" = 5. The validity of the content of the instrument was ensured through the review of experts in water management from the different WOs; Internal consistency is considered acceptable for the diagnostic purposes of the study.

3.7 INFORMATION ANALYSIS PROCEDURE

Once the data collection instrument was applied, the information was coded and captured through matrices built with the SPSS Statistics version 25 statistical software. Subsequently, descriptive analyses were carried out through the use of cross-tables in order to identify distribution patterns among the variables considered in the survey. Similarly, Chi-square (χ^2) and p values were calculated to determine the existence of a significant association between the variables under study (Table 3).

With this analysis, the variables whose responses corresponded to statistically significant relationships were evaluated and identified, which in this case corresponded to the variables, Size of the OOA and some strategic planning tools (Table 3). Regarding the other variables, no significant evidence was found that there is a relationship.

Table 3

Statistical values of χ^2 and p

Variable1	Variable2	Chi square	p
Size OOA	Elements used in EP	20.222	0.003
(Large, Medium, Small)	Major investments	13.493	0.036
	Strategic Planning	13.810	0.031
OO Type (Paramunicipal, State)	Strategic Planning	3.412	0.332
	Elements used in EP	2.864	0.413
Location (North, West and Central Zone)	Strategic Planning	11.546	0.073
	Elements used in EP	2.625	0.854

Note: Prepared by the author with data obtained from the SPSS analysis.

4 RESULTS

The Chi-square test ($\chi^2=13.81$) performed between the variables "size of the operating agency and strategic planning" indicates that, since $p=0.031$ and is lower than the significance level of 0.05, there is a statistically significant association between the size of the operating agency and the level of strategic planning. In the case of the variable "if it has carried out the strategic planning process, what elements do it use", the statistical values found ($\chi^2=20.22$ and $p=0.0025$) also indicate that there is a statistically significant association between the size of the operating agency and the elements used in the strategic planning process. The variables "important investments are mainly made for" and the size of the OOA presented results ($\chi^2=13.493$ and $p=0.036$) that show that there is a statistically significant association between both variables. In none of the other cases were statistically significant associations found.

Regarding the importance of having planning areas in the OOAs, there is a consensus (100%), but institutionalization is incomplete since only 48% of the OOAs have a planning department.

The results obtained show that 33% of the surveyed WOs do not apply a strategic planning process but 38% have planning in progress. On the other hand, only 10% have a completed strategic planning document and 19% only have the budget linked to strategic priorities (Table 4). This indicates that there is a partial and fragmented adoption of planning, where 1 in ten WOs has a formalized plan and less than a fifth link the budget to strategic

priorities, which demonstrates a weak integration between planning and financial allocation, with a significant gap between ongoing planning and formalization.

The results show (Table 4) that small OUs have the greatest vulnerability: 75% without planning processes. On the other hand, the large ones show greater institutional progress: a greater proportion with a plan in progress, completed plans and budgetary linkage. That is, size is associated with the degree of institutionalization of planning: the larger the size, the greater the capacity to document planning and link budget.

Table 4

Declared level of strategic planning

Planning level	Size			Total	%
	Large	Medium	Small		
No strategic planning	1	0	6	7	33
Ongoing planning	5	2	1	8	38
Completed EP Document	2	0	0	2	10
Budget linked to strategic priorities	2	1	1	4	19
Total	10	3	8	21	100

Note: Prepared with data obtained from the survey for n=21.

Figure 1 classifies the AOAs into four levels of planning implementation (in progress, without planning, budget linked to priorities, and completed plan document), taking as a reference the model of Vinzant and Vinzant (1996) cited by Poister (2010) which establishes that at least four levels of successful implementation of strategic planning in public organizations should be considered. Most OOA are located at low to intermediate levels, confirming that planning is not institutionalized. This visualizes the gap between the regulatory expectation (planning area, linked POA) and the operational reality.

Figure 1

Level of strategic planning of the OOA analyzed.



Note: Own elaboration adapted from Vinzant and Vinzant (1996).

The planning elements used in the OOA are: The review of the mission, development of the vision and the goals and objectives. 57% use all three elements of planning. This suggests that, when there is planning, it is presented in an incomplete way, for example, the review of the mission without clear goals, limiting its transformative capacity (Table 5).

Of the AOAs that identified with ongoing strategic planning, it focuses mostly on mission review (22%), vision development (7%), and development of goals and objectives (14%). Large AOAs tend to develop complete and structured processes (89% applied all elements). On the other hand, medium and small OUs apply elements in a more fragmented way. This reinforces the difference in technical capacity and scope of planning by size (Table 5).

Table 5

Planning elements used in OUs

Elements	Size			Total	%*
	Large	Medium	Small		
Review of your organizational mission	0	1	2	3	22
Developing a vision for the future	1	0	0	1	7
Development of goals and objectives	0	2	0	2	14
All	8	0	0	8	57
Total	9	3	2	14	100

Note: Prepared with the data obtained from the survey. *Percentage calculated on valid n (n=14). Of the total of 21 agencies, 7 do not apply because they did not report planning processes.

Regarding the type of operations in the OOA that use strategic planning, it is observed that the largest percentage (62%) focuses on the daily actions that arise on a day-to-day basis. On the other hand, it is only used by 5% of day-to-day operations and long-term projects. As for long-term investment projects, only 14% of the OOA apply it (Table 6).

Small OOA concentrate resources on maintaining operations (88%), which shows a lack of margin for strategic investments. On the other hand, large companies combine sustaining operations with efficiency-oriented improvements, which reflects greater technical and financial capacity for strategic investments (Table 6).

Table 6

Activities where Strategic Planning is applied

Planning level	Size			Total	%
	Large	Medium	Small		
Sustain daily operations	6	0	7	13	62
Long-term projects	0	2	1	3	14
Increase efficiency	3	1	0	4	19
Daily Operations	1	0	0	1	5
Total	10	3	8	21	100

Note: Prepared with the data obtained from the survey.

From the above data (Table 6), it can be deduced that planning is used reactively (daily management) rather than strategically (investment, transformation). This explains why planning does not translate into coherent investments or structural improvements.

There is a predominance of short-term oriented planning at 43%, while long-term planning and with a prospective approach are unrepresentative with 21% and 14% respectively (Table 7). This suggests a tension between operational management of daily

activities and strategic vision, since they focus on solving immediate needs, rather than on establishing institutional continuity strategies.

Large OUs (Table 7) have a more balanced distribution between planning horizons. On the other hand, small organizations focus on short- or medium-term planning and without evidence of the long term or prospective approach.

Table 7

Time-Based Planning Guidance Used by WOs

Type of planning	Size			Total I	%*
	Large	Medium	Small		
Short Term (1 year)	4	1	1	6	43
Medium Term (3 years)	2	0	1	3	21
Long-term (5 to 10 years)	2	1	0	3	21
Prospective approach (>10 years)	1	1	0	2	14
Subtotal	9	3	2	14	100

Note. Prepared with the data from the survey. *Percentage calculated on valid n (n=14). Of the total of 21 agencies, 7 do not apply because they did not report planning processes

Regarding the AOAs that responded to the question of the strategic culture they keep, the largest proportion of them (64%) are in the process of maturing. Large OUs are more representative at advanced levels of strategic culture; small ones are more divided between the maturation process and incipient ones (Table 8). Only 14% have a fully developed culture and the cases are presented in large organizations since they are the ones with the greatest administrative, technical and financial resources.

Table 8

Diagnosis of the strategic culture of the OOA

Culture	Size			Total I	%*
	Large	Medium	Small		
Fully developed	2	0	0	2	14
Maturation process	5	3	1	9	64
Incipient	2	0	1	3	22
Subtotal	9	3	2	14	100

Note. Prepared with the data from the survey. * Percentage calculated on valid n (n=14). Of the total of 21 agencies, 7 do not apply because they did not report planning processes.

5 RECOMMENDATIONS

In accordance with the relationship between the size of the OOs and strategic planning, it is recommended to implement differentiated strengthening programs according to the size of the organization. In the case of small organizations, it is suggested to provide technical support for the development of basic planning structures. For medium and large organizations, it is recommended to strengthen the mechanisms of budget linkage and strategic monitoring.

It is also important to institutionalize the planning areas, train middle management, link the Annual Operating Programs (AOPs) with the budget and establish monitoring and evaluation mechanisms according to the results obtained in the surveys and where everyone agrees (100%) on the importance of having a strategic planning department.

It is proposed to implement a strategic planning model that helps to improve the management and long-term sustainable development of the WOs. The proposed model comprises four main phases ranging from strategic analysis to implementation and control of strategies (Figure 2), as described below and which answers four basic questions:

1. Where is the Operating Body now?

Phase 1. Performance Audit

- a. The Agency.
- b. Corporate Principles
- c. Regulatory and institutional framework

Phase 2. Situational analysis

- a. Internal Analysis
- b. External Analysis
- c. SWOT Analysis
- d. 5 Porter forces

Phase 3. Determination of the Comprehensive Performance Index

- a. Proposal of performance indicators

2. Where does the body want to go and what results does it want to achieve?

- b. Establishing the Mission and Vision
- c. Performance Objectives and Goals
- d. GAP Analysis

3. How could the organism get there?

Phase 4. Formulation, analysis, evaluation and selection of strategies and generation of scenarios to achieve the goals and objectives of the area under study.

Phase 5. Strategy Implementation

4. How to measure performance?

Phase 6. Monitoring, evaluation and adjustments.

- a. Performance evaluation
- b. Monitoring of performance indicators
- c. Settings

Figure 2

Strategic planning model to improve the performance of the OOA's.



Note: Authors' elaboration adapted from Mugabi et al. (2007).

6 DISCUSSION

In the study, an analysis was carried out to identify whether there was a relationship between strategic planning and the types of water operating agencies (WOs) classified as paramunicipal and state. According to the result of the statistical data ($p > 0.05$) it was determined that there is no statistically significant association. Statistical values (Chi-square and p) were also calculated to determine the existence of a statistically significant association between strategic planning and the area (North, West and center) where the AOAs are located, this relationship being negative.

The analysis where it was determined that there is a statistically significant association was between the size variables (large, medium and small) of the OOA and strategic planning where a statistically significant association was obtained according to the values of chi square and p .

The results of the diagnosis show that the strategic culture in the Water Operating Agencies (OOA) in Mexico is in an incipient stage (10%), since only 14% is fully developed, which confirms the need to institutionalize planning in the water sector. This finding coincides with what was pointed out by Camacho González et al. (2024), who identify that the absence of a long-term vision and the lack of permanent technical structures are critical factors that limit efficient water management in the country.

Although 48% of the OOA reported having an area responsible for planning, the use of the strategy is mostly concentrated in short- and medium-term operational actions, which confirms that planning is perceived as a reactive tool and not as a mechanism to guide institutional transformation processes. This trend has been documented in other public sector studies, where planning is used as an administrative compliance instrument and not as a change management process (Johnsen, 2021; Vandersmissen et al., 2024).

WOs that implement formal strategic planning processes have better institutional performance, as mentioned by some authors. The findings showed that agencies with planning schemes present greater operational coordination, continuity in the execution of projects and a better articulation of goals; however, the low proportion of OOA with strategic plans limits the generalization of this positive effect. (Pari Llanos & René Díaz Flores, 2024)

The limited adoption of classic strategic planning tools, such as SWOT analysis, prospective approach or benchmarking, demonstrates a significant gap between the theoretical models widely disseminated in the literature (Altwaijri & Alhomedan, 2025; Guyadeen et al., 2023) and the operational reality of AOA

In this sense, the strategic planning model proposed in this study represents an alternative by integrating diagnostic approaches, tactical formulation, and implementation and monitoring phases. Its flexible nature would allow it to be adapted to different sizes and management models, which is key considering the heterogeneity among the AOA (INEGI, 2020).

7 CONCLUSIONS

The study confirmed that strategic planning is not consolidated in the Water Operating Agencies in Mexico. Almost four out of ten agencies have no planning processes at all, and only one in ten have a formal documented plan. Strategic planning, when it exists, is mostly short-term oriented (43%) and is limited to reactive actions of daily operation (62%), with no link to long-term institutional objectives.

The empirical results confirm that the size of the OOA significantly affects the level of formalization of planning unlike other variables such as the type of agency and location. Large

agencies show greater organizational maturity, presence of specialized departments, and budgetary linkage, while small agencies lack the technical capacity and administrative resources to institutionalize these processes. This inequality highlights the need for differentiated public policies that strengthen planning according to the scale and capacities of each agency.

For the consolidation of strategic planning, three essential conditions are required: (1) the creation of permanent planning units, with trained technical personnel and continuity beyond the political and administrative cycles; (2) linking the budget to strategic priorities, ensuring coherence between institutional objectives and the allocation of resources; and (3) incorporating performance indicators, which allow for monitoring progress and strengthening accountability to citizens.

Agencies that do use strategic planning (57%) report the existence of a unit in charge of this function in a higher proportion, which suggests that the adoption of strategic processes requires not only administrative will, but also minimal organizational infrastructure. On the contrary, agencies that do not implement strategic planning (43%) show a higher frequency of absence of such a department, which suggests a more reactive operation, focused on daily operation and without formal mechanisms to guide long-term decisions. This relationship shows that the institutionalization of planning depends to a large extent on the internal structure of the agency.

The OOAs that report the use of strategic planning are also those that have developed recent formal processes in the last 5 years (23%); while those that do not use it show a low incidence of these practices. This finding confirms that strategic planning not only depends on the existence of a responsible area, but also on the temporal continuity and periodic updating of plans. The lack of recent planning can generate reactive decisions, less capacity to anticipate water crises and a weakening of administrative and financial management.

In summary, the results show that the implementation of strategic planning is associated with more defined organizational structures, greater formalization of processes and a more future-oriented management. On the contrary, organizations that do not use it tend to operate in a more improvised way, which potentially increases vulnerability to problems such as shortages, deterioration of infrastructure and low financial sustainability. These findings are consistent with the literature on water management, which notes that strategic planning is a key factor in raising governance, operational efficiency, and service quality. (Vandersmissen et al., 2024) (Mugabi et al., 2007)

The Strategic Planning model for OOA proposed in this work constitutes an adaptable tool for the different types of OOA in the country. Its gradual application can facilitate the

transition from improvised operational schemes to institutionalized strategic management processes, thus contributing to strengthening water governance in Mexico.

It is recommended to promote the adoption of the model through: Technical training of operational and managerial personnel; linking the budget to strategic priorities, defining institutional performance indicators, and administrative continuity beyond municipal political cycles.

It is imperative to promote the institutionalization of permanent planning units in OOA through the state planning law, through administrative provisions that guarantee structure, professional profile and operational continuity beyond municipal political cycles. The explicit linking of the strategic plan with the budget should be a condition for access to state and federal support programs. This would encourage alignment between strategic priorities and resource allocation.

Finally, it is suggested that future research evaluate the implementation of the model in pilot cases, as well as explore citizen participation and the use of digital technologies as tools to strengthen strategic planning in the water sector. It is also advisable to use a larger sample size and random sampling. This study would be complemented by a satisfaction survey of the users of the OOA.

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