

Proposal of a Model of Organizational Design to Manage Drinking Water Agencies in Mexico City

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Abstract

In Mexico City, drinking water agencies do not work properly; their organizational design is a cause of that. The purpose of this paper is to integrate a model of organizational design to manage those agencies correctly. From documentary research, concepts and models of this topic are analyzed. The following is a description of management focused on organizational structure in drinking water agencies in Mexico and in Mexico City. This paper concludes with the integration of a model for that city, and it is suggested further scientific research in that country because there are too many drinking water agencies with problems in their organizational design.

Keywords: organizational structure, organizational design, organizational structure in drinking water agencies in Mexico City, organizational design in drinking water agencies in Mexico City.

1. Introduction

The term organizational structure is defined according to some of the most recognized authors on this topic (Fayol, 1927; Scott, 1987; March & Simon, 1958; Blau, 1974; Mintzberg, 1997; Etkin, 2000; Robbins & Judge, 2014).

The following section is a description of models of organizational design. First, are described traditional models characterized by being rigid and controlled (Burns & Stalker, 1994), such as simple structure (Mintzberg); functional structure (Fayol, 1927), and divisional structure (Richard, 2012). On the other hand, adaptable and flexible designs are analyzed (Burns & Stalker, 1994), such as team structures (Robbins & Coulter, 2013), project and matrix structures (Richard, 2012), and boundaryless organization (Robbins & Coulter, 2013).

After that, it is defined management in drinking water agencies in Mexico. For this, it is analyzed the Constitution of Mexico (Constitución Política de los Estados Unidos Mexicanos, 2014) and the National Water Law (Ley de Aguas Nacionales, 2013) to understand what kind of authorities perform management and how they are organized. Later, it is described management in drinking water agencies in Mexico City. It is emphasized trouble because this city is the second most populated entity in Mexico (INEGI, 2010), and a centralized entity (Gobierno del Distrito Federal, Secretaría del Medio Ambiente, Secretaría de Obras y Servicios, & Sistema de Aguas de la Ciudad de México, 2007). It is also explained the authorities involved in drinking water management and existing problems due to the organizational design in these organizations.

The purpose of this paper is to propose a model of organizational design to manage properly drinking water agencies in Mexico City. To achieve this, a review of concepts and models of organizational design is done. Afterwards, it is clarified how management in drinking water agencies in Mexico is in order to understand better how the authorities control management of this resource in Mexico City. Then are identified the most important elements of organizational design analyzed according to the context of this research.

2. Research Method

This research is documentary and descriptive within a non-experimental transeccional design (Hernandez, Fernandez-Collado, & Baptista, 2014), because a review of the literature is performed, considering the high impact research to describe organizational structure and their designs; so that, in this way, it is explained how the context of an organization of drinking water in Mexico and Mexico City is.

3. Conceptualization of Organizational Structure

Fayol (1927) explains organizational structure in terms of the following activities: technical, administrative, commercial, financial, security, and accounting. Moreover, March and Simon (1958), in contrast to the above definition, note that the term consist in aspects of a behavioral model in an organization that are relatively stable. Blau (1974) focuses on distribution of people in different social positions that influence the role of them in their relationships. In addition, Scott (1987) provides a general definition, he describes structure as a logical relationship of the functions in an organization, arranged to perform its purposes efficiently. Similarly, Mintzberg (1997) indicates that it is the sum of ways in which coordinated work is divided by tasks. Following the same argument, Etkin (2000) adds that structure in terms of its design is a process to define tasks, authority, roles, responsibility, and communication links between sectors that make up an organization. In the same way, Robbins and Judge (2014) outline that the organizational structure defines how job tasks are formally divided, grouped, and coordinated. For this paper, the most suitable definition is given by Scott (1987), because water in an organization must be a logical relationship between its functions to achieve the purpose of managing water efficiently.

4. Organizational Design

According to Robbins and Coulter (2013), organizational design is a process that involves the following key elements:

- 1) Work specialization: it is a division of work activities into job tasks.
- 2) Departmentalization: it is the basis by which jobs are grouped together. It could be departmentalized by product, function, customer group, geographic location, or process (Robbins & Coulter, 2013).
- 3) Chain of command: it has lines of authority at different hierarchical levels (Fayol, 1927). Factors that affect this key are authority, responsibility, and unity of command (Robbins & Coulter, 2013).
- 4) Span of control: it is the number of employees a manager can manage properly (Fayol, 1927). It includes several variables such as similarity and complexity of employee tasks, the physical proximity of subordinates, the degree to which standardized procedures are in place, the sophistication of the organization's information system, the strength of the organization's culture, and the preferred style of the manager (Robbins & Coulter, 2013).
- 5) Centralization: it is the degree of concentration of decision-making in lower-level employees in an organization. The elements involved here are the size of an organization (Blau & Schoenherr, 1971, Mansfield, 1973), the technology used (Child, 1973), and the environmental relations (Lawrence & Lorsch).
- 6) Decentralization: it is the opposite of centralization (Hage & Aiken, 1967a; Blau, 1970).
- 7) Formalization: it is the employee behavior guided by rules and procedures (Hall & Tolbert, 2005). Here the following factors affect an organization: centralization of power (Hage & Aiken, 1967a), change program (Hage & Aiken, 1967b), technology (Hage & Aiken, 1969), tradition and culture (Zhou, 1993). Immediately, the most common types of organizational design are described.

4.1. Types of Organizational Design

Traditional models are characterized by being mechanistic: rigid and controlled (Burns & Stalker, 1994), it stands out that an organizational design is performed considering six elements of organizational structure, which causes having a complex organization. On the other hand, it stands out six types of organizational design in management: 1) simple structure: it contains low departmentalization, wide spans of control, centralized authority and little formalization (Mintzberg); 2) functional structure: it groups similar specialties (Fayol, 1927); 3) divisional structure: it is formed by separate, semi divisions (Richard, 2012). On the other hand, there are adaptable and flexible designs that are organic (Burns & Stalker, 1994): 4) team structures: they are formed by groups and teams (Robbins & Coulter, 2013); 5) matrix and project structures: here employees continuously work on projects (Richard, 2012), and 6) boundless organization: it is one that is not bounded by horizontal, vertical and external boundaries, such as virtual organization and network organization (Robbins & Coulter, 2013).

5. Management in Drinking Water Agencies in Mexico

Before dealing with this topic, it is worth considering that in contemporary times, in most regions of the world, it was considered that water management is responsibility of a state, and therefore it is part of public administration. What is more, a state may delegate certain functions to private organizations for water management.

That is why public-private partnerships have been a predominant model, other civil associations include civil society organizations, municipalities and the private sector. For that reason, there is diversity of organizational structures for carrying out water management, because in international water management there is no law attributable to a country; so there are international laws governing common areas for all countries in the world (World Water Assessment Programme, 2009).

In the case of Mexico, in article 25 of the Constitution of Mexico (*Constitución Política de los Estados Unidos Mexicanos*, 2014), it is described that the Mexican state is responsible for national development. Moreover, most of management decisions analyses are made at the federal level, and, therefore, they are concentrated in the executive branch of the Federation. This stems from articles 124, 73 fractions XVII, and 89 section I of the same law. According to this, the legislature established in article 4 of the National Water Law (*Ley de Aguas Nacionales*, 2013) of Mexico about the authority and management in national water and the inherent public goods corresponding to the Federal Executive, which delegated that responsibility to the Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*, 2012). It has a decentralized agency that is the main managerial authority for water in the country: the National Water Commission of Mexico (*Secretaría de Gobernación*, 1989, *Comisión Nacional del Agua*, 2012a).

It is important to note that the state of this country is responsible for developing public policy to lead the country to have greater economic activity (Brito, 2008) for the welfare of its citizens (Canales, 2012). That is why this country has a National Development Plan (*Plan Nacional de Desarrollo*, 2013) to guide policies and programs of the federal government of Mexico, in this case water management.

Because of the regulations Mexico has, the organizational structure in drinking water agencies is centralized because the National Water Commission of Mexico is mainly divided in central offices, basin organizations, and local managements. The company headquarters is in Mexico City, it supports basin organizations and local managements in order to achieve sustainable water management by performing good policies, strategies, programs, budgets, laws, etc., in every region of the country (*Comisión Nacional del Agua*, 2012b).

Basin organizations are responsible for managing and preserving national water in each of the XIII hydrological-administrative regions of the country, because for management purposes, the National Water Commission of Mexico has grouped its basin regions into XIII. Each region has a management entity known as basin organization, and the manager of each organization is submitted to the general director of the National Water Commission of Mexico, that means those hydrological-administrative regions are decentralized entities belonging to the National Water Commission of Mexico (*Comisión Nacional del Agua*, 2012b).

Despite the constitutional amendment to article 115 of the Constitution of Mexico (*Constitución Política de los Estados Unidos Mexicanos*, 2014) introduced in 1997 to give more autonomy to institutions of Mexico, there are still too many difficulties of various kinds. Proof of this is that in the period from 1950 to 1980 efforts were remarkable. In 1950, only 17.09% of the dwellings had piped water inside them, and only 26.34% took it from the public hydrant. Overall, only 43.42% of people had the water service; while from 1980 to 1995, a period in which water services were provided by some states and most municipalities, in 1995 the coverage of piped water inside their houses had increased to 54.41%; coverage outside these had increased to 29.96%; and access through a public hydrant had been reduced to 1.5%. In general, drinking water had reached 85.62% and the growth rate of the dwellings with piped water was only 3.80%, significantly lower than that was recorded in the period from 1950 to 1980 (Rodriguez, 2008).

6. Management in Drinking Water Agencies in Mexico City

Mexico City or Federal District of Mexico is home to the Powers of the Union (*Estatuto de gobierno del Distrito Federal*, 2014). It is the financial center of Latin America and the political, economic and cultural capital of Mexico (*ProMéxico*, 2013), and one of the largest urban centers worldwide. It is also the second entity more populated in Mexico (with almost 9 million of people), increased with the passage of time (*INEGI*, 2010), that can cause some problems such as water scarcity (*Organisation for Economic Co-operation and Development*, 2009).

It is worth considering that Mexico is a centralized country, government services and industrial development have been concentrated in Mexico City, because it has 45% of national industrial activity; it has 38% of the gross national product; and, together with the metropolitan area concentrates 20% of the population of the country (Gobierno del Distrito Federal, Secretaría del Medio Ambiente, Secretaría de Obras y Servicios, & Sistema de Aguas de la Ciudad de México, 2007).

According to article 44 of the National Water Law (Ley de Aguas Nacionales, 2013), the Federal District of Mexico has the authority to manage water in its territory, and, based on article 46 of the same law, it may establish agreements with governments of the states of Mexico. Mexico City is divided into 16 boroughs, and there is one borough head in each borough, who is the highest authority within these agencies (Estatuto de gobierno del Distrito Federal, 2014). It is important to consider that the Water System of Mexico City is the most important agency for water management in this city (Sistema de Aguas de la Ciudad de México, 2010), and it is coordinated with the government of this city (Ley de Aguas del Distrito Federal, 2011).

The organizational design of drinking water agencies in Mexico City is shown in Figure 1. The Drinking Water and Sanitation Management of the Hydrological-Administrative Region XIII, Waters of the Valley of Mexico, distribute drinking water in Mexico City through the Cutzamala System, obtaining water of 7 dams for water treatment. Within this process, this management is coordinated with the Automation and Sectorisation Management and the Technical Management of the Water System of Mexico City (Reglamento interior de la Comisión Nacional del Agua, 2012), whose main functions are the preparation of studies for public works projects and the management of public works for the drinking water supply in Mexico City, respectively (Sistema de Aguas de la Ciudad de México, 2010). On the other hand, in the Water System of Mexico City the Institutional Strengthening Management is responsible for providing emergency water services; the Construction Management is responsible for coordinating and monitoring the implementation of programs of construction of water; the Drinking Water and Water Treatment Management performs operation of water infrastructure; the Maintenance Management runs hydraulic maintenance; the Management of Verification and Connection of Boroughs provides coordination of water services for population, and the Users Support Management is responsible for the coordination and monitoring of commercial management and residential infrastructure (Sistema de Aguas de la Ciudad de México, 2010).

It is important to stand out that the managements of drinking water in boroughs participate in the development of water programs and they implement them according to the regulations of the Water System of Mexico City; they lend within its demarcation water supply and sewerage services, considering guidelines, and they also analyze and opined about rates, they give preventive and corrective maintenance to secondary water networks of drainage and sewerage. Another role that they have is to attend timely and effectively citizenship's complaints because of the provision of water services within their competence (Ley de Aguas Nacionales, 2013). However, for a borough head, it is easier to find an instance that is the final decision maker, rather than be subordinated to a decentralized entity where he can only say, may suggest and even discuss, but not participate in a decision (Rodríguez, 2008). There is a problem in decision-making at the local level because they depend on the approval of the federal authority (Cooper, 2012).

On the other hand, the Water System of Mexico City has got the service of private companies, which are part of the public drinking water, drainage and sewerage (Sistema de Aguas de la Ciudad de México, 2014). Commercial management and water infrastructure support is controlled by the Water System of Mexico City through 4 concessionaires submitted to the Users Support Management (Agua de México, 2014; Bal-ondeo, 2013; Proactiva, 2013; Sistema de Aguas de la Ciudad de México, 2010), consisting of installation and maintenance of meters, billing, replacement of water networks, among other activities (Bal-ondeo, 2013). Regional centers have customer spread over 16 delegations in activities that contribute to the concessionaires (Sistema de Aguas de la Ciudad de México, 2014).

Results achieved by concessionaires have been uncertain (Marañón, 2004). Since its management, an increase was recognized in water charges that went from 100 to 1.000% annually (Martinez, 2004), combined with poor service, and a pending evaluation for these concessionaires is still in progress (Castro, 2004; Campero, 2011; Food & Water Watch, 2009). It is needed a commitment with the federal government to have an efficient and coordinated water service (Jardines, 2008).

7. Discussion and Proposal of a Model of Organizational Structure in Mexico City

Different organizational designs were analyzed in order to identify the elements that should have a model for Mexico City, as Pfeffer (1982) indicates that a suitable organizational design depends on the context in which an organization is immersed. In Figure 2, a proposed model is shown. Note that it is a conceptual model because in this type of models are visually represented the theoretical constructs of interest, and how they are relating to each other (Creswell, 1994). The current organizational design in drinking water agencies is a traditional type because there is rigidity in its structure (Burns & Stalker, 1994). Furthermore, it has a departmentalization by process (Robbins & Coulter, 2013), because in each management is done a specific activity to manage drinking water (Sistema de Aguas de la Ciudad de México, 2010). However, managers lose sight of what is the best for the entire system of drinking water management. They also have little knowledge about what other water organizations perform. Therefore, a drinking water service is based on supply, and different economic interests are in this mixed management, for that reason water price has raised and there is lack of coordination and control between public and private organizations, besides slow decision making due to the centralization and bureaucratization of drinking water agencies.

Therefore, a team structure (Robbins & Coulter, 2013) is proposed for members of drinking water agencies in order to have greater authority and to reduce barriers between functional areas, without neglecting work responsibilities in their areas. This allows managements of water in boroughs to have greater autonomy and that they are not submitted to the chain of command and span of control (Fayol, 1927) of the Director of the Water System of Mexico City to perform their activities, so time would be reduced to make decisions and costs would be lower. It should also be considered to reduce the number of managements in the Water System of Mexico City, and each management of the 16 boroughs should perform some of the activities of these managements. It should be left the Management of Drinking Water and Sanitation of the Hydrological-Administrative Region XIII, Waters of the Valley of Mexico and it should coordinate with the Technical Management for the supply of drinking water to the boroughs. The Management of Verification and Connection of Boroughs should control activities of the 16 boroughs. The other functions of the managements shown in Figure 1 and removed in Figure 2, should be performed by each borough. In addition, each organization should be coordinated efficiently. To achieve this, in Mexico City should be a amendment in articles from 7 to 14 and 30 of the Water Law of the Federal District (Ley de Aguas del Distrito Federal, 2011), since in that law the functions of the Water System of Mexico City are indicated, and article 18 of the same law indicates the functions of the 16 boroughs.

The current departmentalization is suggested to leave it as it is, it means by processes (Robbins & Coulter, 2013). What is more, commercial management and water infrastructure support should be performed by each borough; there will not be necessary to hire concessionaires and to have offices of attention to the public, because these offices might be submitted to the managements of drinking water in each borough and they might help them in their commercial management and water infrastructure support. Similarly, less centralization would exist because agencies will be more flexible in its structure (Hage & Aiken, 1967a), and they also will have less formality (Hall & Tolbert, 2005).

8. Conclusions

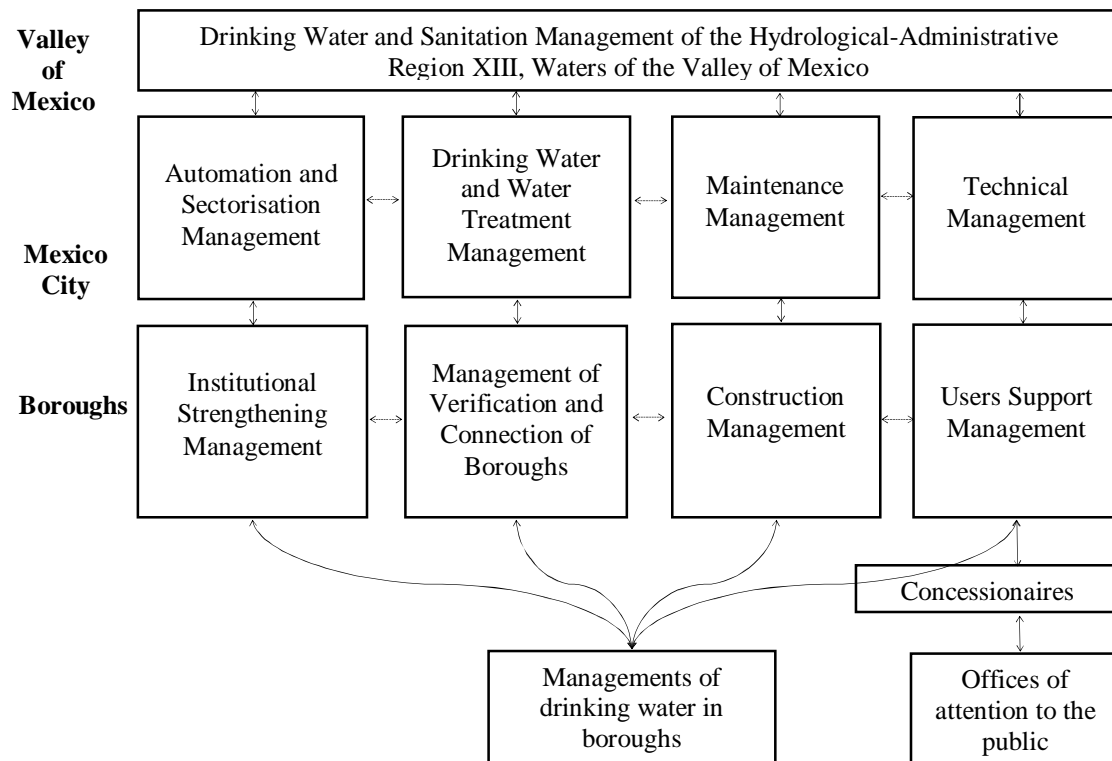
For this paper, a documentary and descriptive research within a non-experimental transeccional design was chosen (Hernandez et al., 2014). This allowed to do a research in the literature to describe the term organizational structure according to some of the most recognized authors on this topic: such as Fayol (1927), Scott (1987), March and Simon (1958), Blau (1974), Mintzberg (1997), Etkin (2000), Robbins and Judge (2014). The most appropriate definition for this paper was given by Scott (1987), because water in an organization must be a logical relationship between its functions to achieve the purpose of managing water efficiently. Moreover, some models of organizational design were described. First, were described traditional models characterized by being rigid and controlled (Burns & Stalker, 1994), such as simple structure (Mintzberg); functional structure (Fayol, 1927) and divisional structure (Richard, 2012). On the other hand, adaptive and flexible designs were described (Burns & Stalker, 1994): team structures (Robbins & Coulter, 2013), project and matrix structures (Richard, 2012), and boundaryless organization (Robbins & Coulter, 2013).

After that, it was described management in drinking water agencies of Mexico according to their organizational structure. For this, it was analyzed the Constitution of Mexico (Constitución Política de los Estados Unidos Mexicanos, 2014) and the National Water Law (Ley de Aguas Nacionales, 2013), in order to understand how authorities manage water and why they have a problematic organizational structure.

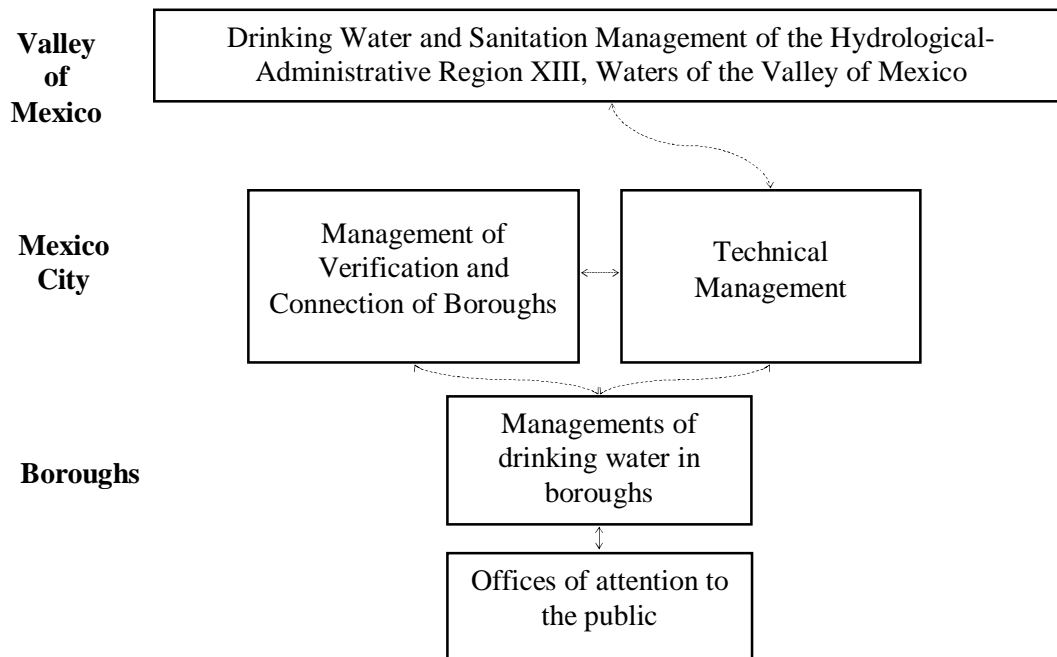
Afterwards, it was delved into drinking water agencies in Mexico City. It was found that this city is the second most populated of Mexico (INEGI, 2010), and it is a centralized entity (Gobierno del Distrito Federal, Secretaría del Medio Ambiente, Secretaría de Obras y Servicios, & Sistema de Aguas de la Ciudad de México, 2007). Furthermore, there are a large number of managers that perform a specific activity for the management of drinking water, the managers of the Water System of Mexico City are the most important authorities in this city to achieve a common goal which is to manage water infrastructure, provision of public drinking water, drainage and sewerage, treatment and reuse of wastewater, and auxiliary activities of the Ministry of Finance of Mexico. In addition, the managements of drinking water in the 16 boroughs aid to achieve this goal; however, they are submitted to the decisions that are taken in the managers of the Water System of Mexico City (Reglamento interior de la Comisión Nacional del Agua, 2012; Sistema de Aguas de la Ciudad de México, 2010). All of this creates organizational complexity and problems in the management of drinking water. Moreover, another finding was that there is a mixed management: private and public (Agua de México, 2014; Bal-ondeo, 2013; Proactiva, 2013; Sistema de Aguas de la Ciudad de México, 2010), caused problems in functions within the structure of the water management system (Marañón, 2004; Martínez, 2004; Castro, 2004; Campero, 2011; Food & Water Watch, 2009).

For the proposal model, an analysis of organizational designs was done in this paper, in order to propose a conceptual model (Creswell, 1994). A more flexible organizational design was suggested: a team structure (Robbins & Coulter, 2013) for members of drinking water agencies to have greater authority and to reduce barriers between functional areas. There was also proposed to leave only two managements of the Water System of Mexico City and not to continue hiring concessionaires. These managements should be coordinated with the 16 boroughs, so time would be reduced to make decisions and costs would be lower. To achieve this, it was proposed to amendment articles from 7 to 14 and 30 of the Water Law of the Federal District (Ley de Aguas del Distrito Federal, 2011), since here are indicated the functions performed by the Water System of Mexico City, and in article 18 of the same law, functions of the 16 boroughs are specified. Finally, it is contributed to the way of how managers of drinking water agencies in Mexico City manage this resource according to the organizational design of their agencies explained in this paper. Nevertheless, it is suggested further research in these issues because of the limitations of this research, for the reason that there are too many complex drinking water agencies in Mexico with trouble.

Figure 1: Model of Organizational Design for Drinking Water Agencies in Mexico City



Source: own elaboration based on Bal-ondeo (2013), Reglamento interior de la Comisión Nacional del Agua (2012), and the Sistema de Aguas de la Ciudad de México (2010).

Figure 2. Proposal of a Model of Organizational Design for Drinking Water Agencies in Mexico City

Source: own elaboration based on Bal-ondeo (2013), Reglamento interior de la Comisión Nacional del Agua (2012), and the Sistema de Aguas de la Ciudad de México (2010).

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