

Successful case of Change Management toward business sustainability

First whole-cycle implementation of
AquaRating in the world

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Water and Sanitation Division

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SUCCESSFUL CASE
OF **CHANGE**
MANAGEMENT

T O W A R D
B U S I N E S S
S U S T A I N A B I L I T Y

FIRST WHOLE-CYCLE IMPLEMENTATION
OF AQUARATING IN THE WORLD

QUITO METROPOLITAN PUBLIC POTABLE
WATER AND SANITATION COMPANY
(EPMAPS) 2018

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Background

According to the United Nations, water scarcity affects more than 40 percent of the world's population, an alarming figure that will likely increase as a result of climate change and the rise in global temperatures. While 2.1 billion people have achieved better access to water and sanitation since 1990, the decreasing availability of quality potable water is an important problem that affects every continent.

In 2011, 41 countries experienced water stress; 10 of those were at risk of running out of a renewable source of freshwater and now find themselves dependent upon other sources. The increase in droughts and desertification are already exacerbating these trends. It is estimated that at least one in four people will be affected by recurring water scarcity by 2050.

Latin America freshwater reserves

31 % Latin America holds 31% of the world's freshwater reserves.

40
MILLION people lack access to potable water.

125
MILLION people lack access to sanitation services.¹

70 % of wastewater returns to rivers without being treated.²

150
THOUSAND deaths by waterborne illness annually.

85 % of these are among children younger than five years of age.

¹ AVINA <http://www.informeavina2013.org/>

² Los retos de Agua en Latinoamérica, Sergio Campos <https://www.youtube.com/watch?v=eUgJthneSLY>

5

Map of Ecuador

88%

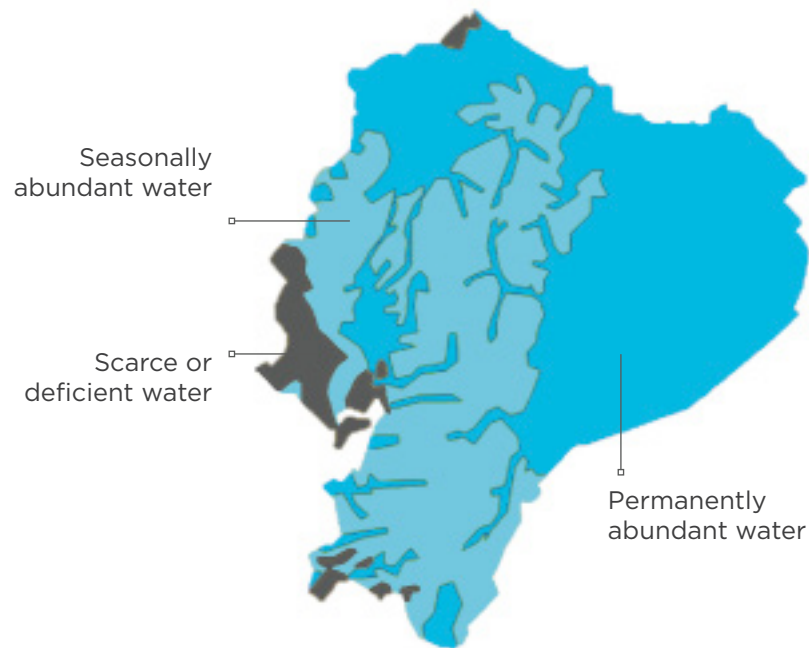
Access to water
on average

70%

Sewer

25%

There are sectors of
the coast, especially
where these
indicators do not
exceed 25%.³



Source: https://issuu.com/falconeria/docs/agua_potable_y_saneamiento_ecuador

In light of the rapid population growth in the city of Quito and the notable increase in the demand for potable water, the City Council decided to look for new alternatives to respond to the growing needs of the population. For this reason, in June 1960, the Municipal Potable Water Company was formed, which in 1993 merged with the Municipal Sewage Company, giving birth to EMAAP-Q, created by Ordinance 3057, on November 18, 1993.

City Ordinance 309, dated May 5, 2010, replaced EMAAP-Q by creating the Quito Metropolitan Public Potable Water and Sanitation Company, EPMAPS⁴, whose primary objective is to: “design, plan, build, maintain, operate, and, in general, exploit system infrastructure in order to capture, conduct, produce, distribute, and commercialize potable water; collect rainwater; and the collection, movement, and treatment of wastewater.”

³ SENAGUA

⁴ <https://www.aguaquito.gob.ec>

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Article 4 of the Organic Law of Public Companies (or La Ley Orgánica de Empresas Públicas, LOEP, in Spanish), published in October 2009, recognizes that public companies are legal entities in the eyes of the law, with their own assets and endowed with their own budgetary, fiscal, economic, administrative, and management authority, with the goal of managing strategic sectors and providing public service.

With respect to city regulations, Ordinance 301 was passed in September 2009, establishing a common framework for the

organization and functioning of metropolitan public companies, highlighting the standard regarding the autonomy of companies and the rules, administration, and management of them, solely to ensure coordination between the Decentralized Autonomous Government, that is to say, the Municipality of the Quito Metropolitan District.

The company is regulated by the Organic Law for Water Resources, Uses and Water Usage, through the Water Control and Regulation Agency (ARCA, in Spanish).



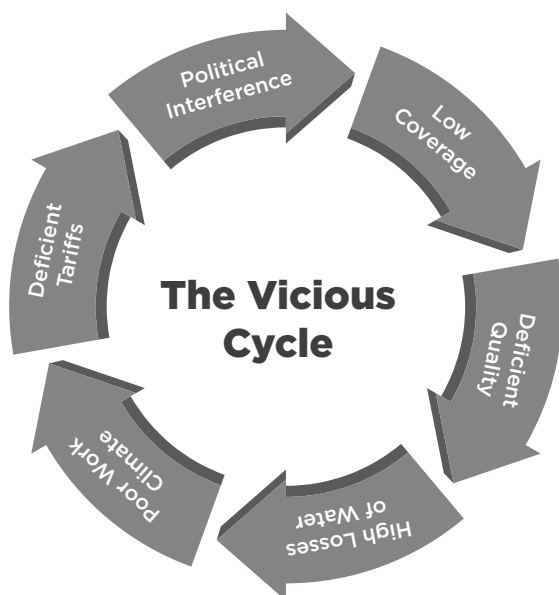
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From vicious cycle to virtuous circle

A very important challenge facing the sector concerns the issue of water management, which has been characterized by a vicious cycle in which predominant problems include limited potable water and sewage coverage, as well as – a significantly worse problem—the treatment of wastewater; potable water that does not conform to service norms and deficient service; high losses, both commercial and operational; a poor working environment within institutions; low billing that doesn't even cover operating costs; and, as well, a high level of political interference.

The great challenge for operators is to move from a vicious cycle to a virtuous

circle, one in which the following variables are achieved: high service coverage; minimal water losses; a satisfactory work environment in which there is a salary-based compensation system; efficient rates with equitable, sustainable, and transparent parameters; regulation and control; and best practices in corporate governance and business management.



Source: EPMAPS

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EPMAPS-Quito Water has been part of this transformation, a journey that has taken no less than 15 years (2003-2018).

The area of coverage for potable water and sewage services is the Quito Metropolitan District (DMQ, in Spanish), which covers a surface area of 4.235,2 Km² and is located between 2,400 and 4,500 meters above sea level, within a large inter-Andean basin, with distinct geomorphological features, climatic zones, and ecological systems, which are exposed to a variety of potential risks (earthquakes, landslides, and eventual volcanic eruptions). In addition, the coverage area includes the city of Quito and 33 suburban and rural municipalities. The water sources are, for the most part, located 3,400 meters above sea level, in the Andes Mountain Range.

The Company implements a variety of actions to ensure direct, quality water consumption, with quality assurances and safety procedures in place at every point in the process, thereby achieving a 99.9% approval rating with respect to Ecuadorian Standards Institute's standard 1108.

As one of the major supporters of the Quito Water Protection Fund (FONAG, in Spanish), EPMAPS-Quito Water plays an important role in investing in green infrastructure. EPMAPS contributes 2% of the annual tariffs received through potable water and sewerage services; it is also the owner of 20,000 hectares of land where the city's main water sources are located.

DMQ

2.7 million

population approximately.



99.2 %

coverage rate with respect to potable water with continuous service.

93.8%

sewage coverage rate. Its greatest challenge in the years ahead will be in the area of wastewater treatment.

641,000

customers and 1,768 service providers.

220 million

cubic meters of potable water in 20 treatment plants, which are supplied by 240 superficial water sources, which cover, in total, a demand of 8 m³/s.



23 MW

of energy, which are consumed in the Company's operation; the remainder is sold in the national market.



Focus on results

In the year 2000, DMQ logged the following management indicators:

Indicator	December 2000
Number of users	295.000
Potable water coverage	83.25%
Sewage coverage	65.77%
Index of water quality	98.00%
Index of unaccounted for water	37.10%
Employees x 1,000 AP connections	7
Operational margin	28.29%
Liquidity index	1.07%

* al 2014

As can be seen in the table above, service coverage was low, far from achieving universal coverage. The commercial enterprise evidenced many opportunities for improvement, including adjusting to address overstaffing (three employees per 1,000 connections is considered ideal), among other less relevant factors.

In December 2002, the company signed on for IDB loan 1424/OC-EC, Program for Environmental Health, Phase 1, with the general objective of reducing the occurrence of floods and landslides, as well as increasing the potable water and sewage services in the DMQ's priority areas, as well as strengthening the institutional capacity for efficient service management with respect to potable water and sewage provided by EMAAP-Q.

Specifically, the Institutional Strengthening Component consisted of works and actions intended to reduce costs with respect to the provision of potable water and sewage services, as well as the program of unbilled water and the expansion of the hydrometeorological monitoring system. It also included studies for the creation of a fund that would provide direct subsidies for water use by low-income customers, as well as updates related to service costs.

In December 2007, the entity signed a contract for loan 1802/OC-EC, Environmental Health Program, Phase II, whose objective was to provide those living in the DMQ with potable water, sewage, and flood control services in an *efficient, sustainable manner, with a long-term vision*.

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A variety of business management initiatives were financed under the Institutional Strengthening component, including, among others: (a) the preparation of a Company strategic and operational plan, creation of the 2007-2010 Strategic Plan, a study for the optimization of structural organization and the design and implementation of a plan that assigned resources and follow up to measure progress toward objectives, as well as an improved communication flow within the business; (b) the implementation of an improvement plan with respect to the efficiency of technical processes in the area of Operation and Management at EMAAP-Q, with the goal of reducing costs and improving service quality; and (c) the development of a comprehensive environmental management plan.

These initiatives were carried out by the Executive Unit of the Environmental Health Program (PSA, in Spanish), in direct collaboration with General Management, which helped minimize the risk of political interference in the program's development. Furthermore, capacity in terms of acquisitions and efficient resource management allowed the entity to execute a greater number of processes and works than were planned originally. Finally, quality and permanence of the staff from the Executive

Unit ensured efficiency in the program's development.

With the investments financed by the Inter-American Development Bank (IDB), in addition to an important increase in the DMQ's potable water and sewage coverage, various processes were strengthened, particularly in the areas of business, operations, and planning. Examples include the implementation of an on-site invoicing system; the design of a tariff implementation and subsidy analysis system; a geo-referenced potable water system; implementation of the plan for control and reduction of unaccounted for water, expansion of the hydrometeorological network; and studies for determining the value of fixed assets.

In the second phase, the Technical, Financial, and Operations System Plan was implemented as part of the Master Plan for potable water and sewage service to be achieved by 2040, creating a new organizational structure and formulating a Strategic Information Plan.

As can be seen, all of the actions described above have formed the basis for designing a business model that is efficient in both the short- and medium-term, as we will describe forthwith.

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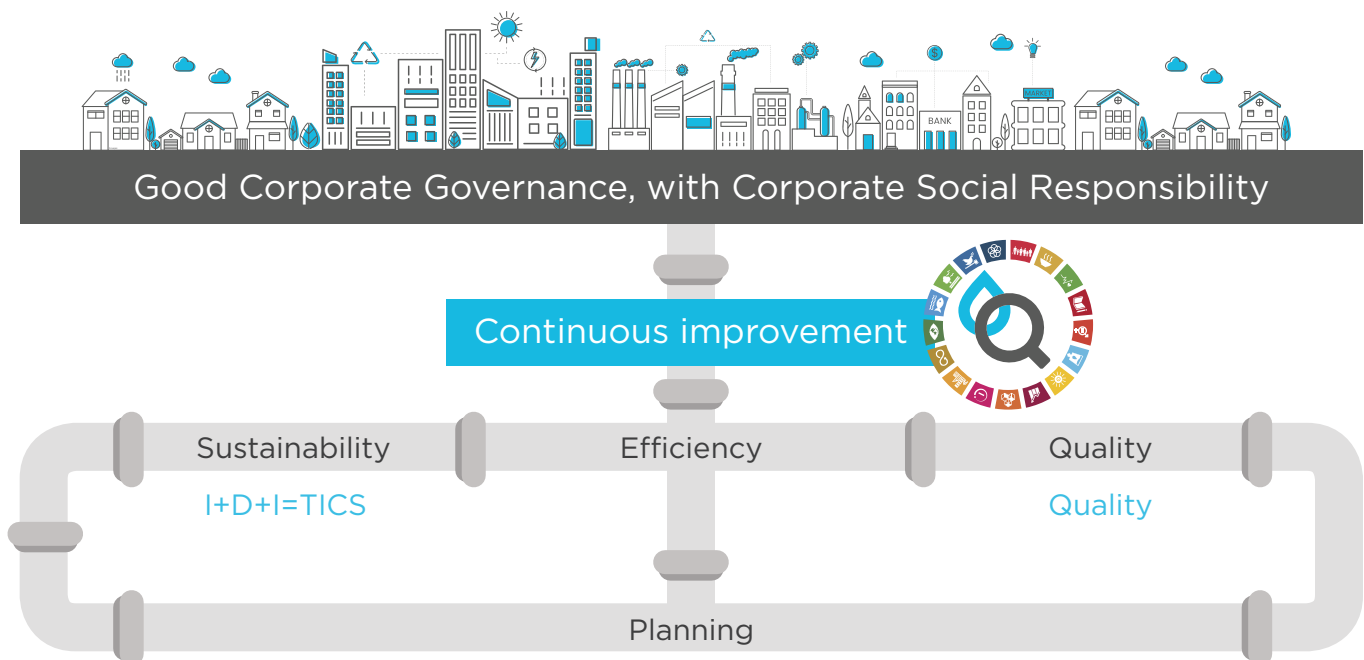
Management model

A management model is a schematic or framework for the administration of an entity. Management models can be applied in companies and private businesses, just as in public administration.

EPMAPS- Quito Water, aligned with the Sustainable Development Goals, particularly SDG 6: “Ensure availability and sustainable management of water and sanitation for all,” has a management model

that links the business mission and vision with medium- and long-term objectives.

This model references as its bases the Constitution of Ecuador and municipal and business planning that are supported by three pillars: sustainability, efficiency, and quality, which support good corporate governance and corporate social responsibility practices. All of this is further supported by the concepts of *modernization* (I+D+i y TICS) and *regulation*, through continuous improvement that takes as its model the AquaRating System of Evaluation and Characterization⁵.



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Planning system

The Company designed a short-, medium-, and long-term planning system comprised of the following components: technical, financial, and strategic. In this regard, the Company has a Master Plan for Potable Water and Sewage, formulated with a view toward the year 2040, as well as the Plan for the Decontamination of Quito's Rivers, which establishes investment projects that the business's technical management should undertake.

The strategic plan is complemented by a long-term financial plan, which takes into account expected revenues, investments, operation and maintenance costs, and

administrative and financial costs, thereby calculating projected financial projects with the view of establishing mechanisms for guaranteeing a stable financial picture.

All of these elements are reflected in their respective sections of the strategic plan, programs, projects, indicators, and goals, which are monitored continuously by information systems in order to make smart decisions, following the Execution Premium model by Drs. Kaplan and Norton.

The management indicators used by the Company, as they evolve over time, situate the Company in a respectable position, not only at the local level, but also at the international level, a fact that is affirmed by the benchmarking carried out by ADERASA.



Corporate Governance

The Company incorporates best practices of corporate governance, based on the following pillars, to ensure optimal performance of EPMAPS-Quito Water; to protect the rights and equity of DMQ citizens; to promote internal and external transparency; and to foster confidence in the financial markets that allow the Company to access the resources it needs to finance expansion and maintenance projects for the potable water and sewage systems:



Pillars of good corporate governance



Government Structure



Accountability



Equity



Transparency



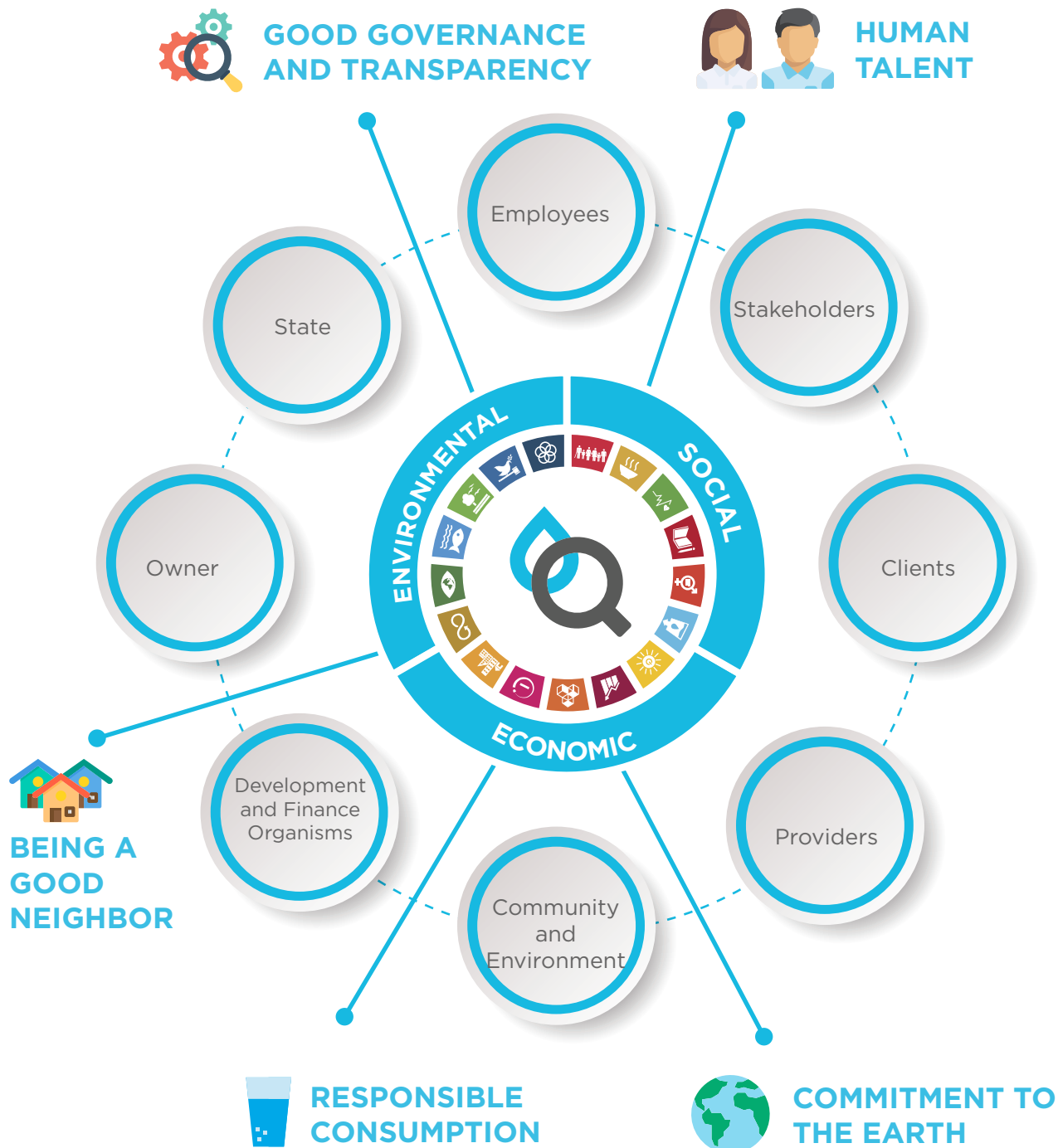
Responsibility

Source: Código de buen gobierno corporativo [Code of Good Corporate Governance]

Good corporate governance, (or BGC, in Spanish), furthermore, clearly establishes the roles and scope of each government organ (municipal, directorate, and general management), the establishment of the property, responsibilities, decision-making process, supervision, business efficiency, transparency, and the creation of shared value and sustainable growth within the Company, as well as the establishment of an environment in which control and accountability of accounts flourishes, and the presence of good corporate governance practices.

The adoption of these practices, which are voluntary in nature, become a competitive advantage, generating benefits for EPMAPS. They also endow the Company with a greater value in the eyes of other service providers, putting it in a leadership position and modeling maximum transparency, which represents an intangible asset of the first order. This position, in turn, is viewed positively by capital markets, insurance companies, qualification agencies, clients, and providers in general.

Sustainability Model: (Axes, stakeholder groups, and action areas)



The Company has implemented a corporate social responsibility (CSR) strategy aligned with a new urban agenda and different Sustainable Development Goals,

particularly SDG 6, based on city law number 084, "Social Responsibility for the Development of the Metropolitan District of Quito," the ISO 26000 standard, the 10

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principles of the Global Pact, the Organic Law of Transparency and Access to Public Information, and the sustainability standards of the Global Reporting Initiative (GRI).

In this realm, in 2017, through the technical support of the IDB in the areas of transparency, information management, and governance in the water and sanitation sector, RG-T2744, a governance framework and action plan was developed, consisting of policies, a management model, an assessment of stakeholder group relationships, and more.

In this way, EPMAPS defined its sustainability model through actions and initiatives that sought to generate shared value with all stakeholder groups, seeking to create positive impact in five primary action areas: commitment to the Earth, responsible consumption, being a good neighbor,

good governance and transparency, and, in addition, human talent, further aligned with the three axes of corporate social responsibility: environmental, economic, and social.

The Company has also invested significant sums in changing the back office and front office platforms with the ERP and ISU tools of SAP, with cloud support, as well as new projects using GIS and ESRI for intelligent business and data integrity.

In addition, through the technical transparency collaboration, information management, and governance in the water and sanitation sector, EPMAPS participated in the development of an integrity plan based on a toolbox (CANVAS), in which action plans were developed in several critical areas.

AquaRating

The AquaRating Model

As has been described above, the Company has a management model focused on Sustainability, Efficiency, and Quality, but lacked a mechanism for implementing it. It was practiced for empirical purposes, but was ultimately superficial, performative, and disorganized. After investigating various existing options in the market with no result, the IDB, in close collaboration with the International Water Association (IWA), developed AquaRating (www.AquaRating.org), a tool allowing comprehensive and objective evaluation of all areas and processes in the value chain for companies providing potable water and sanitation services; identifying potential opportunities for improving strategic indicators and applying better practices, and defining a baseline for developing processes for continuous improvement, innovation, learning, and change management.

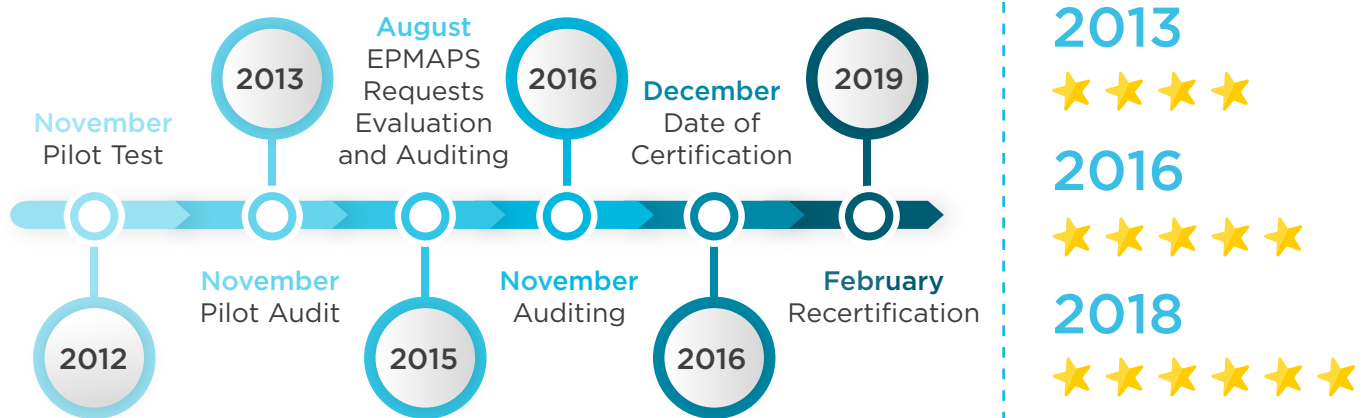
Between 2014 and 2015, pilot tests were run with 13 companies in the sector, resulting in the development of the document, AquaRating Standard (*Estándar AquaRating*⁶), and the development of the first version of the software, in which EPMAPS also participated.

The pilot consisted of two parts: 1. Input of information to obtain testing results (part A), and 2. The auditing of this information at both the office and site levels (part B). Through this opportunity, EPMAPS was able to request an audit of its data, with the goal of clearly defining the state in which the Company was functioning in all areas. As a result, it obtained a baseline that allowed it to develop and implement an improvement plan, with a view toward becoming the first certified Company in the world and complying with its continuous improvement strategy.

By 2016, this plan was put into action, with operations and continuous improvement in progress. EPMAPS was the first Company in the world to complete the process and it obtained certification in December 2016, and recertification in February 2019.

⁶ Source available at: <https://publications.iadb.org/es/aquarating-un-estandar-internacional-para-evaluar-los-servicios-de-agua-y-saneamiento>

17



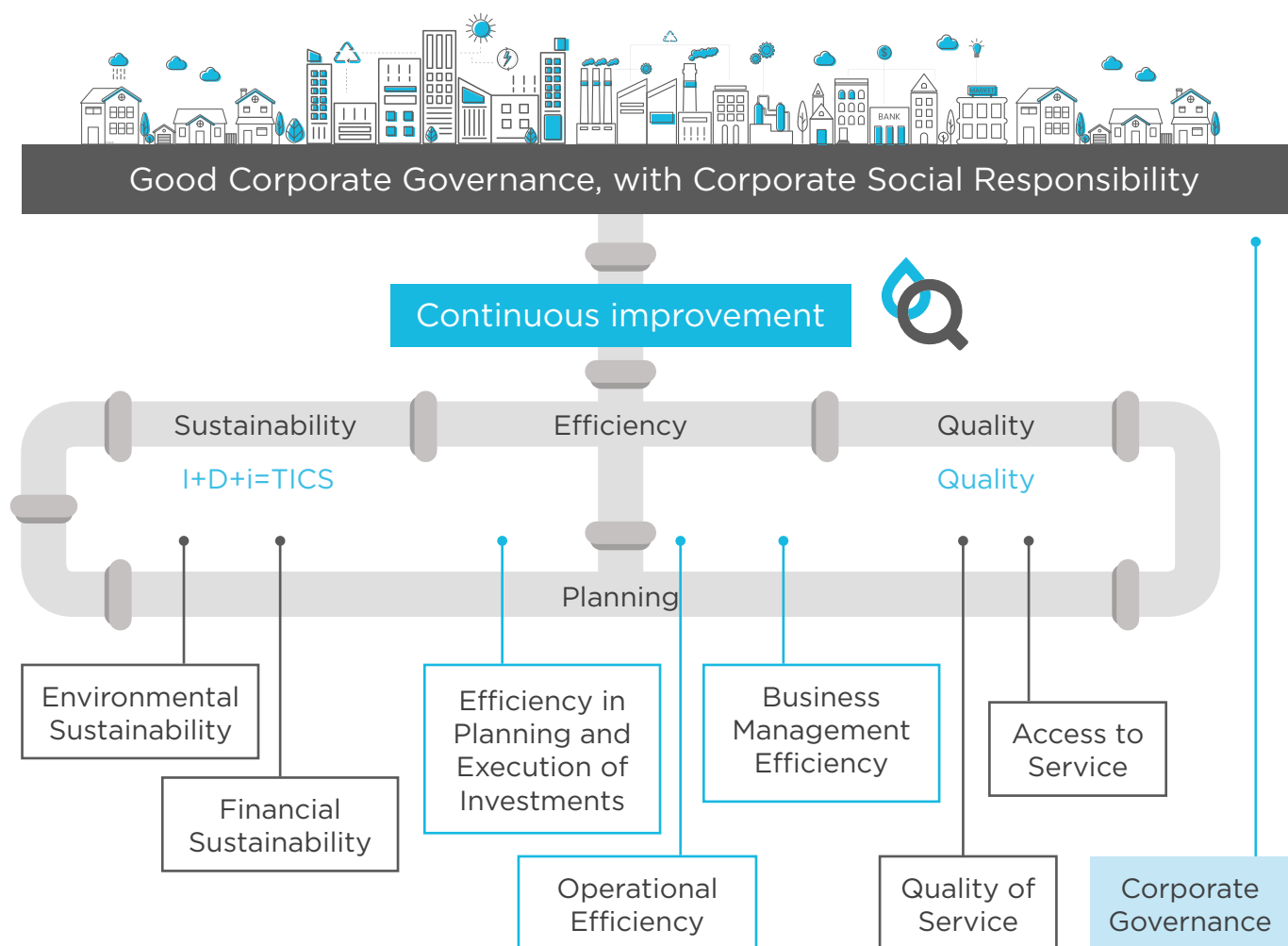
Clearly, this is a system developed specifically to evaluate companies in the water and sanitation sector, and to that extent, it is highly prescriptive with respect to the required practices and demanding with respect to the performance indicators for the goals that have been set. It is prescriptive given that its practices describe in detailed form how they should be applied and/or the minimal levels required for application.

This **voluntary and universal system** offers a model for **evaluating and characterizing** water and/or sanitation service in a way that is *rigorous, comprehensive, and based on reliable information*. It contains eight areas of evaluation, 60 indicators comprised of 101 variables, and 52 test groups comprised of 389 individual tests.



Its adoption by EPMAPS

EPMAPS-Quito Water aligned AquaRating within its management model, adopting it as its principal tool, as can be seen in the following figure:



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The eight areas of evaluation assessed by AquaRating are well-aligned with the elements of the business model: efficiency (planning and execution of investments, operation, and business management); sustainability (environmental, financial); quality (quality of service; access to service); and corporate governance.

To implement AquaRating as a business management tool, a multidisciplinary work team was comprised of key staff, under the coordination of the Quality and Process Department, which is in charge of making connections among the different technical, administrative, and support areas, that provide information related to practices and indicators. The same is true regarding the design and monitoring of improvement plans. All of this information is validated by the managers of the respective areas. The composition of this team did not generate any additional costs. Given that the workload is relatively low, it does not require full-time staff.

The work team is structured in the following way:

Technical Areas



6 delegates

Administrative Areas



5 delegates

Support Areas



2 delegates

EPMAPS-Quito Water, at a general level – which is to say, in the eight areas of application – conducts self-evaluations on an annual basis using AquaRating, applied to the following workflow:



Creation of improvement plans

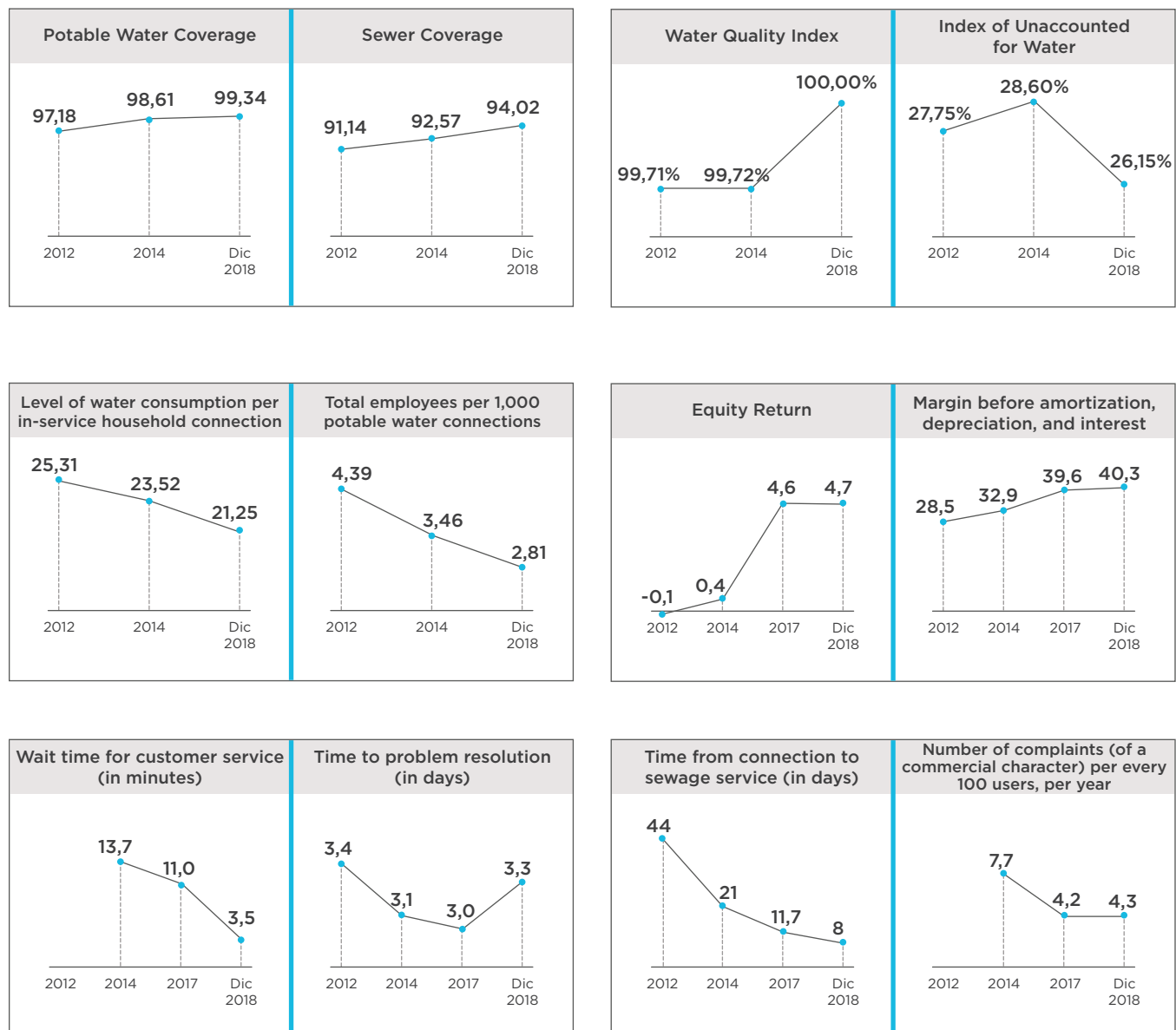
A product of the self-assessment exercises, this is a tool for continuous improvement that generates improvement plans, with the objective of incorporating or improving practices and achieving indicators toward goals. These plans are designed following the process indicated in the figure below:



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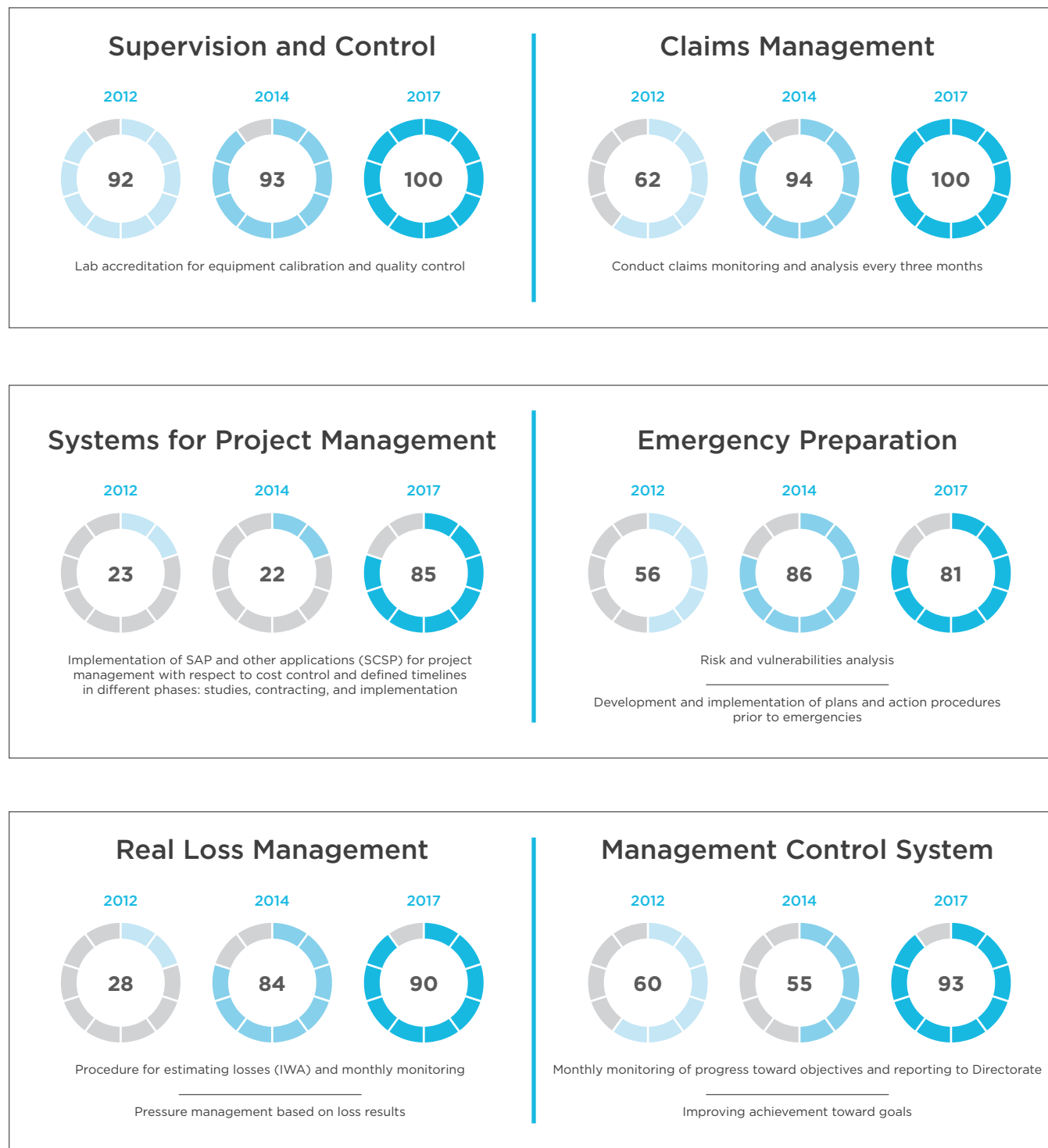
The design and continuous monitoring of these plans guarantee compliance with goals, indicators, adoption of best practices, etc., thereby achieving continuous improvement, as can be seen in the following figures, in which we have chosen three points at which we can observe indicator tendencies. The first is from 2012, when EPMAPS participated in the pilot project and whose information

was the subject of a thorough audit. The second is from 2014, the year in which **Quito Water (Agua de Quito) was the first company in the world to be certified under the AquaRating standard.** The third moment was from February 2019, the date when they obtained recertification, also the first in the world to do so.

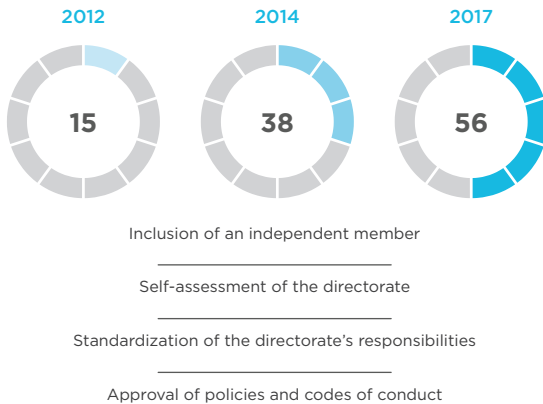


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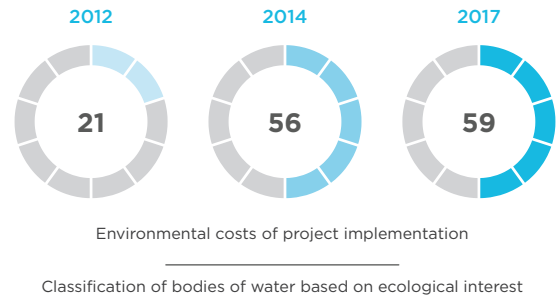
The same procedure has been used to refine improvement indicators or the incorporation of new practices. Here are some examples:



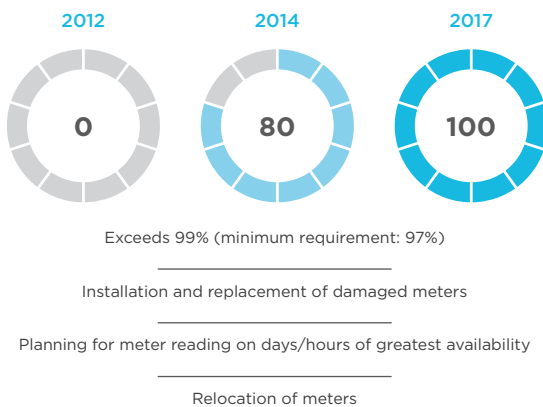
Functioning of Corporate Governance



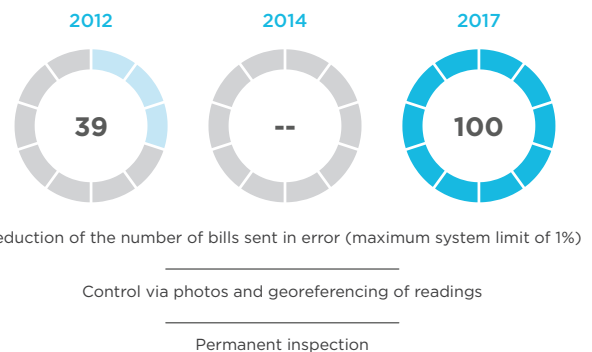
Environmental Implications of Planning



Billing Efficacy



Billing Errors



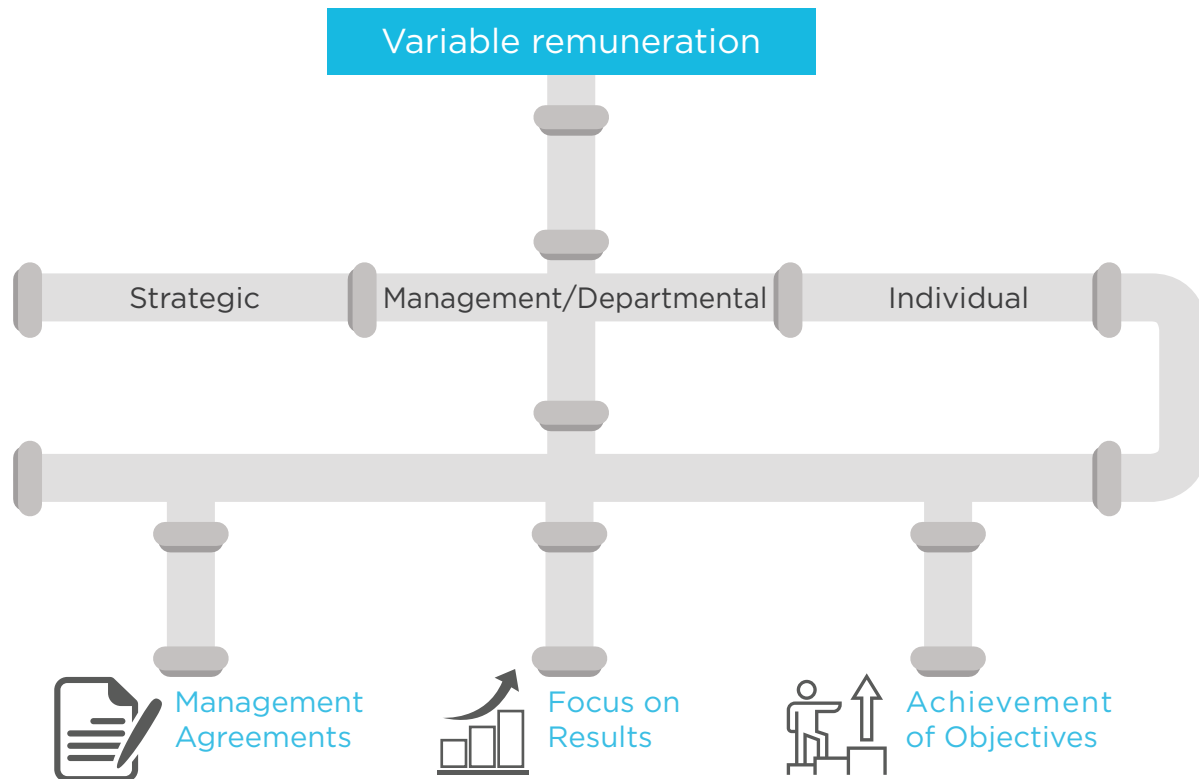
Business culture in pursuit of results

Another important aspect has been that of rooting the achievement of improvement plans resulting from the application of AquaRating and other sources within a return on investment framework: “Variable remuneration or results-based remuneration.”

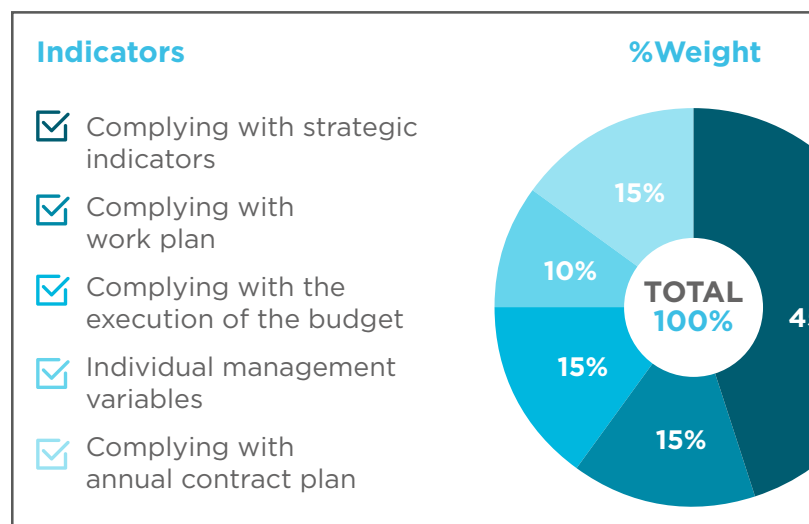
To adopt this system of remuneration, each

manager must subscribe to a management accord with the General Management, in which they agree to comply with the goals established by the indicators (including those of AquaRating), improvement plans, and the annual purchase and budget plans, with each given weight and consideration based on their relative importance.

Variable remuneration schematic



Indicators, weights, and percentages of variable remuneration payments

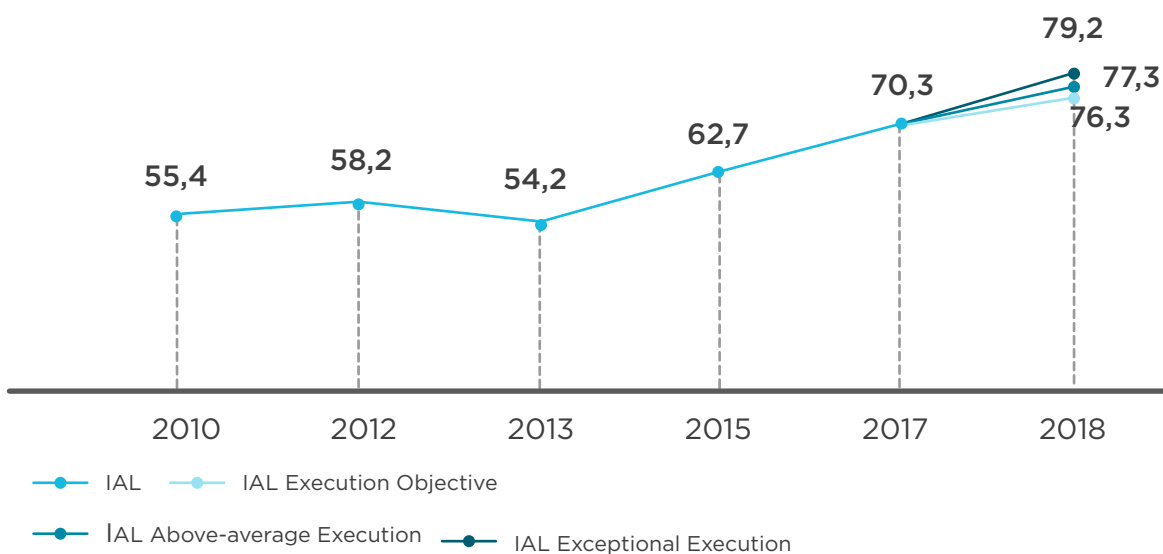


Rating	Condition	% of Payment
<input checked="" type="checkbox"/> Excellent A ★★★★★★★★	95,01% - 100%	100%
<input type="checkbox"/> Excellent B ★★★★★★★★	90,01% - 95%	90%
<input type="checkbox"/> Very Good A ★★★★★★★	85,01% - 90%	80%
<input type="checkbox"/> Very Good B ★★★★★★	80,01% - 85%	70%
<input type="checkbox"/> Satisfactory A ★★★★★	75,01% - 80%	50%
<input type="checkbox"/> Satisfactory B ★★★	70,01% - 75%	40%
<input type="checkbox"/> Satisfactory C ★★	65,01% - 70%	25%
<input type="checkbox"/> Unsatisfactory ★	00,00% - 65%	0%

With compensation aligned within the improvement plans put in place, along with the focus on continuous improvement and a change in organizational culture, the employees changed their manner of working. They were no longer focused solely on clocking in and out, but on achieving results. This also resulted in better teamwork.

This evolution in corporate culture could be seen vis-a-vis an important indicator – the work climate – which was initially measured to be at 55% in 2017 and later achieved 70.3%. This improvement is due to the action plans that were implemented, training, career plans, and continuous improvement, all of which nurtured a profound pride in the company among its employees.

EPMAPS Working Climate



Quantitative results

In addition to the results shown vis-a-vis indicators and in the implementation of practices, it is important to look at the effect that change management has had on the state of losses and gains (audited figures).

Table 5: State of annual losses and gains

	2012 USD	2014 USD	2017 USD	2018 USD
Income from Ordinary Activity	119.643.800,99	133.059.748,59	150.512.842,15	153.177.284,78
Sales Cost	70.173.828,39	63.097.386,97	71.053.957,72	81.077.465,55
Gross Profit	49.469.972,60	69.962.361,62	79.458.884,43	72.099.819,23
Transfers Received	29.679.060,20	23.984.040,53	16.689.623,25	13.151.733,83
Other Income	9.491.666,27	5.409.429,88	5.089.084,65	11.320.107,31
Administration Expenses	42.953.361,77	45.777.149,47	45.747.785,96	40.798.657,73
Sales Expenses	15.424.986,78	17.501.619,62	18.657.499,09	17.843.475,09
Results of Exercise	30.262.350,52	36.077.062,94	36.832.307,28	37.929.527,55
Other Relevant Results		(7.864.436,00)	(2.325.465,75)	933.300,92
Year-end Result	30.262.350,52	28.212.626,94	34.506.841,53	38.862.828,47

If we review the investments and transfers of the municipality, we see that these have decreased over time, from USD \$37.6 million to USD \$13 million in 2018; nevertheless, it has maintained similar levels of investment and has improved with respect to the strategic indicators.

The capacity to generate their own income has improved in recent years, as can be seen in the profit and loss figures (PyG, in Spanish), taking into account that there have not been tariff adjustments.

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It is also important to highlight the reduction in administrative costs and the resulting overall improvement results in a savings of 30 to 38 million dollars.

The following indicators also allow us to appreciate how the financial situation improved:

	2014	2015	2016	2017	Dec 2018
Margin before Amortizations, Depreciation, and EBITDA Interest (Accumulated)	28,29%	30,65%	40,75%	39,56%	40,33%
Liquidity Index* ($\cdot > 1,1$)	1,07	1,03	1,21	1,85	1,85
Debt-Service Coverage Ratio* ($\cdot > 1,1$)	1,59	1,61	1,70	1,26	1,42
Passive Leverage on Equity* ($\cdot < 0,5$)	0,23	0,19	0,16	0,15	0,13

In this table, we can see the improvement in the EBITDA margin, from 28.2% to 40.3% in five years, as is also the case with respect to the liquidity indicator.

Another important outcome is the Risk Classification “AAA” (national level) in 2015, so determined by the international risk assessment entity (Class International Rating).

Between 2014 and 2017, financial auditing statements (EE.FF) were obtained using the International Financial Reporting Standards (IFRS, in English), and in 2017, for the first time, there were no recommendations made by the external auditing firm, thus receiving approval from the state’s General Accounting Office.

Thanks to the financial, technical, and management stability, the French Development Agency (AFD, in Spanish) awarded a \$70 million grant without sovereign guarantee for the construction of the Ramal Chalpi Papallacta y Complementarios Project. EPMAPS is the only publicly held company in Ecuador to obtain a grant of this kind.

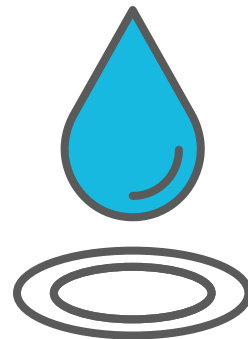


Lessons learned

- The transformation of EPMAPS from a vicious cycle to a virtuous circle has taken around 15 years, guided by a single vision (2003-2018). Thanks to the continuity of business management and the implementation of better practices, as well as the empowerment of and pride among its employees, one can see how the Company achieved high levels with respect to the management indicators and the quality of the work climate.
- Without a doubt, the credit (and technical assistance) provided by the Inter-American Development Bank (IDB), which included management indicators, have motivated the Company to pursue continuous improvement and permanent implementation of the highest standards. For this reason, IDB has become a key strategic partner in the change management project.
- Best practices in corporate governance and corporate social responsibility are essential for creating value and for finding ways to go beyond what the law requires, involving interest groups, embracing innovation, and operating from an ethical, transparent base in order to achieve social, economic, and environmental sustainability.
- The adoption of the AquaRating standard as the primary management tool and the implementation, control, and monitoring of improvement plans based in AquaRating has been of fundamental importance for setting out the business path.
- The big challenge for EPMAPS and other companies in the sector will always be to advocate for the administration and management to be carried out with a purely technical focus, minimizing political interference that causes so much damage. Nevertheless, it is the citizens, as its true owners, who are called to demand management accountability.
- Another factor to consider is the exchange of best practices, such as benchmarking, with entities that are related to the sector, and to operators.

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- Between 2000 and 2019, three general managers have remained in office, ensuring continuity and improving short-, medium-, and long-term planning, as well as achieving goals and management indicators, such as universal coverage of basic potable water and sewage services to the citizens of the Quito Metropolitan District.
- To improve the company's financial health, it has not been necessary to increase rates abruptly, but instead, to improve processes. In this way, they have managed to avoid transferring inefficiencies to end-users while simultaneously working toward achieving financial sustainability.



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