

Inventory of methods to Assess and attest institutional maturity of water utilities

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Summary

Performance assessment is essential to properly manage a water utility. Equally, regulatory agencies must have dependable and firm criteria to analyse and compare the results and response capability of those utilities under supervision. The paper presents 19 different methods for doing this, ranging from some quite simple, to others rather sophisticate. One conclusion is the need to seek fairness towards all utilities, so maybe a combination of various methods is the best. Stress is made about the importance of the information quality as catalyst of institutional development. Usage proposals of the generated statistics are included. The secret for the application of any method is the self-persuasion on the usefulness of routine assessment supported by data, jointly with an administrative obligation to do it.

Key words: *Characterisation, typology, institutional analysis, performance assessment, water utilities monitoring, performance indicators, benchmarking.*

1.- MOTIVE (objectives, or what for):

Normative institutions, of the type of the **CEASG** (*Guanajuato State Water and Sanitation Commission*), require to found their operation, in the knowledge of the characteristics and individual achievements of each one of the several operating organisms in their jurisdiction. The proper understanding of the weaknesses, strengths, advances and flaws of each one of them will allow, the normative institution, to give support or to set equitable liabilities upon them; as well as opportunely canalise resources where are more needed or where they will be better used.

The purpose and need to know the characteristics and performance of each organism, are evident. The difficulty is **how** to carry on the monitoring, so that it is reliable, impartial, opportune, clear and of low cost. On the other hand, it is desirable that the same **supervision** and **support** model impels towards development, creating a true improvement challenge to those being evaluated.

The demonstration of progress being attained by each water utility can be done from different perspectives and with different tools. It is impossible to have an evaluation tool that simultaneously covers all possible points of view, because each person, each mood state and each problem, will highlight particular optics. Nevertheless more stable and accepted criteria exist; that fit better than others to "*common sense*", custom and regulations; or simply that facilitate collating the fulfilment of commitments acquired by the one under evaluation.

If the water utility's "*maturity status*" could be systematically **graded**, there would be elements to judge if the institution is stable, is worthier, is better, and performs with quality. Such comparisons can be done respect to how the same utility was in the past, or against similar companies at the present time. Of course, when saying

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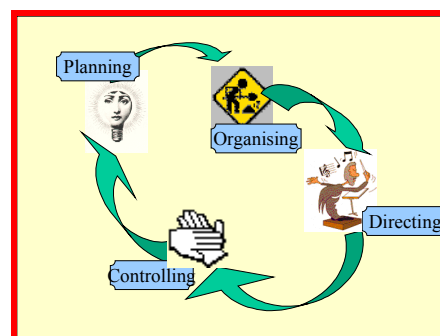
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“qualifications and comparisons” it is fair that equal criteria and rules be applied in all occasions.

The selection of some evaluation method must arise from a thorough and responsible analysis for possibilities; particularly when, by means of it, different people or competing companies compare themselves, and will justify granting distinct supports. The method must be the most equitable and impartial possible, and must avoid being centred in momentary aspects or urgencies. There should be an aim to rate the most stable, permanent and desirable matters; or the demonstration that undesirable practices are being solved and eliminated.

2.- Why (antecedents):

The "management cycle" (see figure) is a usual way to represent the managerial functions and responsibilities in any utility. It starts with "planning" (*desire to do or to improve something*), and then follow other three stages, the last of them being "control" (*monitoring, evaluation*). This illustrates that **performance evaluation** belongs to a later event than implementing or designing an appropriate organisational structure, which guarantees the possibility of fulfilling the utility's inherent mission and duties.



Thereupon the equivalence to propitiate or secure "**institutional maturity**", could be located as something simultaneous or intermediate between the functions of "**organisation**" (*design, implementation*) and "**direction**" (*execution, operation, tasks completion*).

In other words, what allows a **potential-to-do** a good work is to have: competent and trained personnel, infrastructure, equipment, procedures, offices, furniture, cartography, programs and concrete purposes, etc. That could be defined as the **maturity** (*stability, consolidation, congruence or quality*) **to do** something.

However for other people, with different vision, **outputs** (*results, achievements, execution of responsibilities, goals and commitments*), i.e. the performance, may be understood as the authentic **maturity**. There is not a standard or unique definition for "**institutional maturity**" (*or organizacional development*), so for the time being, waiting for a remote future and case of being worthwhile to agree on such definition, here both focuses just described will be used.

The fact that institutional maturity be reflected by the **potential** does not exclude that it be reflected in **outputs** (*i.e., they would not be two visions of the topic, but rather two dimension of a same feature*). This obliges to meditate **how to assess** the status of a water utility, **verifying** that it has the conditions to work efficiently, and measuring its performance (*preferably as approach speed to the targets or goals*). In fact, the potential to give a quality service is not position attained to be permanent, as a "*quantum jump*" from immature to mature utility, but rather is a position requiring continuous investment and attention. On the other hand, a water utility having reached the conditions to work with quality could **lose its impulse** (*e.g. change of municipal administration*) and have deterioration on its performance as well as on its working implements (*pipes network, equipment, hardware*).

Although the need for monitoring and assessment is clear, it is annoying and **worrisome** that still many water utilities (*in developing countries*) and supervisory agencies **lack** of proper control tools. Those not having adequate qualification and comparison

systems (*relative to themselves, or to other utilities, either competitors or allies*), make evident their delay, neglect, short vision, and scarce desire to offer better quality in the services. In fact, the tools, are simply a consequence of having the vision and the will of self-evaluation and improvement, so the **real obstacle** is, indeed, the lack of **interest** or vision inside the utility, as well as the absence of some administrative **obligation** (*accountability towards the advisory or administrative boards, civic representatives, regulating institutions, etc.*) to report about achievements.

When speaking about monitoring, comparisons, valuations and judgements, it is undeniable there is a strong requirement of **data** and **information**. When data should be measured and provided by the same utility under evaluation, an **unquestionable symptom** of its maturity will be *the extent, dependability, speediness, certainty, honesty, consistency, etc.* of such information. So the **quality of their own IS** (*information system*)¹ reflects their development level.

3.- PROPOSAL (*to the point*):

Given that there are various possible criteria to analyse the performance, its is preferable to choose standardised, or already proven methods; as therefore will be easier to share and compare data with other agencies. Also, there is the advantage of already existing formats, tools, or software programs, which will save time and money, along with the certainty that they had been useful in other places.

Assessment methods must be **elected according** with the quality of the information available, or feasible to obtain; as well as with the significance of the surveillance system to use, and the available budget and implementation time. When starting, when no other methods had been used previously, it is advisable to try and test **different simple** models, in order to perfection them with time.

Next table presents an outline of **19** different methods to appraise the maturity and performance of water utilities. The shown list or catalogue resembles a "*brain storm*" which may assist anyone interested, in having a broader criterion upon choosing one, or various, of them; or when developing its own ones.

CEASG has the intention to try some of those methods, and according with results, and acceptance by utilities, later formalise their possible use. Other methods will possibly be used by **ANEAS** (*National Association of Water and Sanitation Utilities*), in order to classify their member utilities. Other models arise from usual practices in different countries, or from recommendations of international technical aid agencies. Some procedures are relatively simple to apply; while others are more complete and sophisticated. Some are based on "subjective" opinions (*but for that less important and necessary*) and others in concrete and demonstrable facts (*measurable and verifiable*).

Is pertinent to say that in most cases the "method name" on the second column of the table is relatively arbitrary, intended just to shortly describe the procedure. The final part of each row contains symbols as: **y, o, n** (*letters y, o, and n*), as a non-rigorous way to orient about each method's difficulty or easiness, and about some special cares that it requires. Later on, in section 4 of this paper, some additional arguments appear, along with references to institutions or places with more details on certain procedures:

¹ MIS stands for Management Information System. In a broad sense it does not refer to a computer or software package, but to something more complex and wide. See Buenfil, in *FEMISCA* magazine, 1997.

Code	Method's Name	Explanation	Some characteristics										
			A	B	C	F	C	F	C	V			
1	Improvements in the quality system	Survey on advances in setting-up a quality system (<i>self-evaluation enquiry-poll-format</i>)	y	y	y	i	i	i	i	i	i		
2	Improvements in different internal systems	Set of enquiries (<i>polls</i>) for different topics, and a pondering system, for a "global qualification" (<i>a "macro-index"</i>).	y	y	y	i	i	i	i	i	i		
3	Existence of basic programs	Qualitative evaluation of implanted vital (<i>routine</i>) projects and formal systems.	y	y	o	i	i	i	i	i	i		
4	Internal standards	Existence of handbooks and standards, with written procedures, in regular use.	n	y	n	i	i	i	i	i	i	c	
5	Outputs of strategic indices	Indices values, respective to any assessment and comparison system (<i>e.g. "point evaluation system"</i>).	n	n	n	i	i	i	i	i	i		
6	Quantity of indicators handled	Number of indices (<i>and institutional areas covered</i>) in order to evaluate the general performance.	n	o	n	i	i	i	i	i	i		
7	Quantity of parameters handled	Number of parameters regularly monitored, and "global" dependability of the information system.	n	o	n	i	i	i	i	i	i		
8	Differences respect to targets	Pondering system of proximity to goals completion. Targets should be agreed beforehand with a regulatory institution (<i>e.g. CEASG</i>). Similar to proposal N° 5, but here assessing "nearness".	n	y	o	i	i	i	i	c	c		
9	Speed of approach to goals	Similar to 8, but rather focusing to speed of change (<i>velocity -a ratio- of approach to targets</i>).	n	y	o	i	i	i	i	i	i		
10	Characterisation of type of utility	Ranking of the utility, according to an agreed (" <i>standard</i> ") typology.	n	y	y	i	i	i	i	i	i		
11	Quality of attention to clients	Results, amounts invested, and time used for attention-to-clients services (<i>phone attention, commercial services, leaks, etc.</i>).	n	y	n	i	i	i	i	i	i	c	
12	Hybrid of models	Any combination of some of the previous criteria (<i>few, several or all</i>).	y	y	y	i	i	i	i	i	i		
13	Intensity of data use	Density and frequency of employment of concrete data and MIS (<i>management information systems</i>) in decision making.	n	n	n	i	c	i	i	i	i	c	
14	DEA	"Data Envelopment Analysis", useful to select benchmarks and compare public services	n	n	n	i	c	i	i	i	i		
15	Clients' opinion	Opinion of users (<i>clients</i>), by socio-economic strata, neighbourhood, etc.	y	y	o	c	i	i	i	i	i		
16	Service quality, by "eu"	Improvement by elimination of undesirable practices	o	o	o	i	i	i	c	c	c		
17	Investment in training	Expenditures, topics contents (<i>programs</i>), time used and people trained in specific periods.	n	y	n	i	i	i	i	i	i	c	
18	Investment in MIS	Changes in quality and reliability of the management information system.	n	y	n	i	i	i	i	i	i	c	
19	Individual diagnosis	Specific and particular diagnosis methodology, as for example WASH (<i>EHP</i>) type.	y	y	n	i	i	i	i	i	i	c	

Notes and meanings in the table:

Working implements: A Enquiry (questionnaire) B Specific format C Self-assessment	Supporting elements F Definitions G Written handbooks H Specific parameters or indices	Difficulty level P simple Q complex
Applicability of some specific method W Qualification for points	Annotations in the columns: n not required or not applicable o could be convenient (voluntary or ambiguous) y yes, important, or Indispensable for the method	

4.- DETAILS (what and how to assess):

This section presents some discussion for each of the “*institutional maturity assessment methods*” mentioned in the previous **inventory**; nevertheless not to extend too much this paper just brief ideas and some references will be given. Some bibliography shown at the end of the paper, contain acquiescent material and examples. Besides, the authors of this paper processed some **appendixes** for support and illustration, and probably by the time this paper be published, some **Internet** pages will be ready with complementary material for anyone interested (*for more information contact any of the authors*).

- 1.- Survey on improvements in installing a **quality system**, through a self-evaluation format applied to different members and types of the staff. Appendix **1.A** suggest a format with 6 questions (*selecting one of 5 possible answers in each case*), covering: a) Attitude and understanding by directives; b) Organisational status; c) Handling of problems; d) Costs and benefits of the quality system; e) Actions to improve the system; f) Perception of the probable opinion of a common employee about the quality system.
- 2.- Group of surveys for different topics using self evaluation formats (*like the previous one, but applied to other subjects. Appendixes 2.B and 2.C show formats for enquiries to assess “progresses and acceptance of a MIS” or a “maintenance control system”*), and a pondering system, which gives a “**global qualification**” (*i.e., a “macro-indicator”*).
- 3.- Qualitative evaluation of **basic** (*vital, routine*) **projects and formal systems or programs** (*sector metering, leak detection and repair, accounts and finances, consumers census, maps, consumers metering and billing, training and certification of personnel, water quality control, preventive maintenance, public communication, stock and acquisitions control, performance statistics, planning and target fixing, distribution and discussion of performance reports, decision support systems*), considering: existence (*yes, no*), quality (*fair, regular, bad*), and evolution (*stable, improving, starting, stuck*). See a possible format in appendix **3.A** and in appendix **3.B** a diagram (*by PHO*) showing the typical subsystems conforming a water utility.
- 4.- Existence of written **handbooks** and procedure **standards**, in regular use. Evaluate: quality, extent, years in use, number of revisions and updating, “density” of changes during the last revision, etc. Similar to concepts of programs and projects mentioned in 3, but focused on written regulatory material.
- 5.- **Values of indices**, respective to certain assessment system. One example of system is the expert software “**SeeA**” (*efficiency evaluation system for water utilities, by IMTA, more details in appendix 5*).
- 6.- **Number of indices** (*and institutional areas covered*) which usually are employed for performance assessment, respective to a given group of specific, “pre-eminent” or “standard” indicators (*e.g. a set required to classify the utility, as in method 10; or for example those proposed by IWSA*).
- 7.- **Number of parameters** regularly monitored; and “global” reliability (*quality*) of the I.S. Comparison against a given set of essential or standard parameters (*e.g. those proposed by SeeA*).
- 8.- Approach to **completion of goals** (*pondering system for the proximity to goals agreed with a normative institution*). Similar to proposal N° 5, but seeing proximity.
- 9.- Similar to 8, but rather focusing on **speed of change**.
- 10.- **Characterisation** of the utility, according to the rank of values it presents in certain indicators, according to some standard typology (*examples in appendix 10*).
- 11.- Amounts, of **money** and **time**, invested (*using comparative indices*) in key programs as: training, MIS development, and attention to clients.
- 12.- A **combination** of some of the previous **criteria**. Which may allow to ponder: **a)** *existence of formal procedures*, **b)** *results concerning standards or commitments*, **c)** *evolution in time*, and **d)** *cost of the evolution*.
- 13.- **Density** of specific **data**, sustained by a MIS, on which decisions are supported, which appear in documents relating to: justification of proposals, requests, or negotiations.
- 14.- **DEA** (*data envelopment analysis*) is a standard method, popular nowadays, for assessing public services (*it eliminates “subjective” weights as are required in a “point evaluation system” --- although, beware, the fact of giving the same weight to all variables in DEA, could not always be a good approach---*). Quite useful in fixing benchmarks. Various references exist and specialised software is available.

- 15.- **Opinion of clients** according to socio-economic stratum, zoning, or similar criteria. They could be simple surveys printed on the billing invoice. Or when people telephone or state any complaint.
- 16.- Improvement of service through "**elimination of undesirable practices**", as: low pressure, interruptions in the service, intermittent supply, delay in repairs, billing errors, neglect of complaints, bribery, etc.
- 17 Recent investments in **training** carried, and impacts on performance. Expenditures, contents, schedules, and people trained in certain period. Pedagogic audits and present employees' skill levels compared to their functions. Existence of systems to certify personnel.
- 18 Investment in **MIS**, and in general in other I.S. (*cartography, equipment inventories, consumers census, network surveys, library, statistics, etc.*). Changes in the quality and reliability of the I.S. and in the data handled.
- 19.- **Specific**, individual and detailed, **diagnosis** methodology (*particular for a given utility*). One example is WASH (*now called EHP, see reference of Cullivan et al*).

5.- DIFFICULTIES (*things to solve in advance and cautions*)

Although there is some difficulty in deciding which monitoring methods are appropriate and impartial; the biggest and true problem is in obtaining **commitment**, **liability** and **continuity** towards the assessment process. Such hindrance is rather foreign to the "supervisor party", who can be: external agent (*civic advisory council, professional auditors*), normative agency (*CESAG, CNA -National Water Commission-*), or the internal water utilities' board of directors. The acceptance and support to the evaluation process (*systematically provide data, and comply with suggestions derived from such evaluation*) must be solved ahead, inside the utility.

In other words, ahead "the **how**", must come the motivation and the **commitment**. So, there is need for a serious reflection about which should be the **conditions** to guarantee the proper operation of such IS and monitoring methods. The following paragraphs remark on that:

- a) as long as the water utility has no **vision of the convenience**, necessity and obligation to handle information in a transparent, solid and updated fashion, no system will last (*agreement, co-ordination, induction and legal coercion; the traditional planning mechanisms, should be used in order to consolidate such systems*).
- b) the previous idea implies the need for an **administrative obligation** (*accountability*) to inform about results attained in the management of public utilities, **combined with:** an effort to **convince** about their benefits; the support to produce **systems** covering from simple to complex matters; the **involvement** of society as a whole, and of individual users, in information verification and validation; as well as several **other** viable mechanisms. For all this, is fundamental to convince people that together with their obligation to pay a fair service tariff, is their faculty to demand a proper quality level.
- c) besides, a "**selective information dissemination**", should be established, according with different "interest profiles" (*in accordance with attributions, faculties and scope*) or authority hierarchy (*e.g. the number connections in X individual municipality should be irrelevant in central CNA offices*). It must be clear the pertinence that a "normative" authority may know about indices and data of a particular water utility.

The own utility (*and the users paying for its services*) should be the most **interested, benefited and compelled** (*a bit of each thing*) to operate *an ample, reliable, opportune, consistent and transparent IS*. So normative organisations, like CEASG, can restrict themselves to just publish information "as sent by each local utility". One justification is that there is no legal attribution to require any utility to come forward and clarify its accounts (*not even CNA can do it*). In given case, the normative office may indicate inconsistencies in the utility's reports, but never should relieve the utility from its liability regarding the information it utters.

The most reliable source for several data is the official census, of individual houses, which federal government produces each five or ten years. In consequence most data, at normal times, must come from **estimations**, reason why they have their own imperfections and rank of probable error (*reliability*), according to the various criteria, methods and definitions used. So one way to stretch out the **heterogeneity** in the **information quality**, is assigning different reliability levels to it (*as in SeeeA software, by IMTA*).

Any assessment system with expectancies of being complete, unavoidably has the "**personal vision**" (*irremediably with subjective criteria*) of somebody or some committee, because equally important are considerations based on concrete and objective management indicators, as well as the analysis of qualitative aspects not easily expressed in figures.

Not because difficulties and problems exist, there is reason to delay initiating what is important and urgent. So efforts should exist towards establishing a **common base**, reasonably consistent, **to compare** utilities and identify items requiring personal attention, by experts, founded in the direct knowledge of the utilities.

The **simple** and informal **methods** presented in section 3 have **advantages** in the sense that with them the need for information is "*softened*" in institutions not really involved in supporting or supervising the local utilities. Besides, the assessment system can be integrated by distinct **simultaneous** and relatively **independent** components (*sub-methods*); and this possibly makes the system less susceptible to negative critics and risk of abandon, and also would be simpler and more economic to update and improve it.

6.- ADVICE (*warnings, conclusions and recommendations*):

There are endless possibilities on how to survey the performance and development level of a water utility. It is not worth grounding the monitoring on a single model. On the contrary, there should exist at least two or three different approaches, applied in a customary and systematic way, when evaluating different utilities, or for internal self-assessment. Besides systematic valuations, eventually some special criteria should be exercised, reason why there should be no disregard for studying and designing methods that apparently "by-now" are unnecessary.

It is important that the, single or various, methods selected, be employed regularly during a reasonable period of time (*maybe 2 to 3 years*). Only when there is enough expertise about one system, or in case it ceases to be a **competition or challenge** (*motivation*) **tool**, there must be an upgrading (*migration, change*) towards wider criteria and focuses. Assessment should grow in astringency and amplitude as the supervised institution reaches greater development levels. Similarly the surveying system should be enriched as the supervising institution or group improves its own criteria (*comparison rules*) and its information systems.

Although not always is necessary or convenient to involve those to-be-evaluated in the election of the method or methods; whenever it is possible, and there are not opposing arguments, it is quite advisable, and **fair**, that the future subjects of control or monitoring, propose and argue their preferences, in a **democratic planning** exercise (*evidently there should also exist exclusive-of-the-supervisor, criteria and methods*). Particularly when the outputs will be publicly disclosed and they could generate dissension, there must be enough clarity in the applied **rules**, making them explicit and with previous **consensus**.

The main message being attempted to transmit here is: *any water utility, in order to offer a fair service level, must before achieve its **consolidation** as organisation (*institutional development*), and one way to prove it, and impel it, is through regularly **monitor** its outputs, applying one or various methods which guarantee **impartiality** and a broad **vision**.*

A good selection of an assembly of management indices will facilitate surveillance of the institution's performance, as well as a correct design of its MIS (*management information system*). Among other things, there should be an attempt to maintain a reasonable balance between the cost of implanting and operating the MIS and the real and potential **benefits** of utilising it. Also there should exist a way to qualify the **reliability** and quality of the handled data, in order to differentiate them in necessary case. *The quality of data provided is an appropriate criterion to evaluate the institutional maturity.*

It is urgent to disclose and to impel the use of surveillance, comparison and diagnosis systems, among water utilities (*in undeveloped countries*), because many of them have huge delays and seem not to notice that, or care about it. They maybe justify it in various ways, but not impartiality considering the real situation against the population needs, their organisational efficiency, the service quality offered, and all improvement possibilities within their reach (*as new technology, legal framework, etc.*).

Not all water utilities endure the same environmental, topographic, economic, socio-political and institutional **conditions**, reason why the "performance self-assessment" needs are not always equal. On the other hand, **performance indices** (*managerial indicators*), which regularly are dimensionless and standard, facilitate **comparisons** among utilities even with different characteristics. Of course comparisons must not be done lightly, nor supported in few indicators. They should be handled with broad mind, by experienced people (*or by well-calibrated "expert systems"*). Indicators may also serve in detecting who carries-out better a given work, or has solved cleverly some problem, so as to propose standards, acceptable ranks, and **benchmarks** (*challenges or milestones*).

A prime motive for the survey of maturity and institutional performance, is to make **comparisons**. This justifies the necessity to conform **statistics**, useful either to each local utility, as well as to normative, technical support, or professional interchange institutions. A prerequisite to have statistics, besides standard definitions, is to have willingness and concrete **commitments** about which set of data (*parameters*) is to be regularly monitored and shared. On the matter several international agencies have made sundry proposals, like *IWSA*, or World Bank. Also in many developed countries there are normative institutions worried to generate reference databases, for example *OFWAT* in England, or *AWWA* in USA. In Mexico, this is just beginning to have impetus, but is clear that it has an increasing intensity. Nowadays *CEASG* has begun to work orderly in this line, and probably soon *ANEAS* also will do it. Likewise, *CNA* will have to extend its databases and share them, in

benefit of the entire nation. *IMTA* may collaborate in spreading statistics and with analyses of techniques for assessment and decision making.

The participation or support of national or state institutions, does not relieve each local utility of being the main one interested, and liable, for its own management, and of having its own IS and self-assessment mechanism.

Although this work is focused in explaining some procedures on **how** to monitor water utilities, one should not forget that before applying any method there must be interest, motivation or necessity about **why** one must evaluate. That, by the moment, seems to be the true difficulty; so work on this line is a priority. Evidently the purpose of monitoring is to know faults, and improvement possibilities; and to act consequently, in order to offer better water service and future institutional stability to the supplying utility.

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