Developing a Model of Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality for Accountability Result

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Abstract: This research develops a model of Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality. A qualitative research ia applied for this research. This study identifies multiple indicator relationships requiring a systemic approach in which iterative cycle processes of interconnections among these indicators are evaluated. This exercise of outcome performance measurement is considered as accountability means for evaluating social equity and environmental justice concerns in the three desirable sectors of governance: the government, the enterprise and the society. This is a part of public sector accountability for result.

Keywords: *Outcame performance, accountability result*

The public accountability through provision of transparent and full performance information is ideally backed up with a sufficient societal right to this. This would act as a control tool if it were granted clearly in the appropriate regulation with a particular legal consequence to the water business players (the Local Government or its public enterprise), if they fail to provide the information publicly. Accountability and control are like a coin. One side of coin as a responsibility is an inseparable element for the other side as a right.

The current right given to a customer under the Consumer Protection Law Nr 8/1999 (Chapter 4 section: Right and Responsibilities, sub section 4 c) only mentions a consumer' right to get true, clear and honest information about the enterprise's product or service condition, and be given a warranty on their goods and services. (Consumer Protection Law Nr 8/1999) This regulation is generally appropriate for private goods and services, but it is not entirely so for public goods and services such as water supplies that carries public missions.

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The regulation does not mention customer and also non-customer rights as individuals or groups to access performance information publicly. The customer through the performance information can evaluate whether or not they are paying their bills at an efficient or subsidized cost.

Non-customers are ideally granted a right in the accountability process, especially in the case of public goods and enterprises, for example, if they are interested in taking up the goods and services offered and becoming a customer, or if they want to know why the service is not being offered to them or is being offered only at particular prices or with particular conditions.

In many cases, performance measures and information are only reported from public enterprises to governmental institutions, but this accountability system cannot directly be considered as a manifestation of public accountability to citizens. Performance information that is kept as secret information only for the company and governmental institutions invites further investigation. A missing link of public accountability from the Local Government and public enterprise to the citizens is always questionable. The possibility that a Local Assembly and Government do not always act on the behalf of public needs can be considered as a political moral standard dilemma

(Keehley, Medlin, MacBride, & Longmire, 1997) p 196–202).

In the future, the regulated requirement of an arrangement of an accountability system should be a part of both: Consumer Protection and Local Government Laws. If the performance information is publicly available, interested individuals or groups in the society can use it to evaluate the water performance service financially, socially and environmentally.

Such a requirement does not mean that the public enterprise needs to print its performance reports and distribute them to all citizens. This would be costly and wastefully cost-inefficient as not all citizens are interested in the information. Performance information should be made available for citizens who are interested in it. They could get the report on the request from the enterprise or the government, or access the information from an appropriate website (enterprise and/or government). This transparent public accountability could be effective in pressing the water actors being more responsible to their public mission, and prevent them from corrupt behaviors.

However, performance information sometimes does not cover all the performance indicators that are needed to evaluate certain aspects of organizational goals and outcomes, especially of social equality and environmental justice. So, the basic question is how to develop a model of performance indicators that can be used as an evaluation tool for assessing water supply service performance socially and environmentally, and as a means of public accountability for results.

"Accountability" is defined by Pollitt et al as "a relationship in which one party (the accountor) is obliged to render an account of his or her actions (or the actions of a particular organization) to another party (the accountee)", while "control" is "the ability of an actor to direct the actions of another - for the first actor to oblige the second (third, fourth and so on) to do things they would not otherwise have done or to refrain from doing things which they otherwise would have done" (Pollitt, Birchall, & Putman, 1998, pp. 12–13).

Accountability and control is a noticeable problem in public enterprises (Hughes, 2003, p. 95). A willingness to present a transparent report from the enterprise to the government and from the government to the society is a supportive environment for better accountability. Transparency is totally needed for accountability. However, there is no warranty that every actor carries good political willingness. Corrupt practices can make corrupt actors try to hide performance information away from transparency and publicity. For example, various motivations among political and business actors related to water provision can be challenge in developing a good governance system. A concern for any government in governing by networks are how to make their private partners effective in administering the services and goods, and to hold them accountable for this (Goldsmith & Eggers, 2004, p. 41).

Three aspects of governance are the core concerns of the World Bank (WB, 1992, p. 2); "accountability, the legal framework for development, and information and transparence". Accountability to citizens is the only way in which performance can be effectively assessed, and the corrupt practices can be eliminated. Making performance information available publicly is essential for a democratic atmosphere. An example would be if interested people in the case of water governance could get access to performance information from the public enterprise management or the Local Government through various media such as their websites, not necessarily in hardcopy.

The meanings of ' performance measure' and ' performance indicator' are often mixed up. A ' performance indicator', as adopted from the International City/Council Management Association by Hatry (1999, p. 13), is defined as ' a specific numerical measurement for each aspect of performance (e.g., output and outcome) under consideration'. Similarly, the International Water Association (Alegre et al., 2000, p. 3) defines a ' performance indicator' as ' a quantitative measure of a particular aspect of the undertaking's performance or standard of service'. The two are effectively slightly different wordings of the same definition for a performance indicator explicitly as a quantitative measure.

However, according to Ball (Ball, 1998, pp. 55–56) this definition is actually of a ' performance measure' rather than a ' performance indicator'. To him a performance indicator is just an indication of per-

formance; while a performance measure is a precise measure of performance. Thus, a performance measure is a particular version of a performance indicator.

In physical science, a precise measure is obligatory, but in the social sciences a precise measure of certain performance is often not feasible or justified. In this case study, water quality has some precise characteristics that have been well established and accepted internationally and considered as measurable on a precise scale. But, other criteria and standards, including financial ratios as one of the most quantified aspects in an organization, generally are only indications of performance or performance indicators with which the organization is evaluated as being relatively 'close to' or ' far from' a certain performance standard.

In this case study ' performance indicator" and 'performance measure' are treated as having the same meaning, to indicate performance for measuring progress. A water quality standard, for example, contains bacteria, chemical and physical indicators. The bacteria and chemical indicators are measured quantitatively but the water physical indicators are evaluated qualitatively, in terms of the aggregated opinion of stakeholders on the water clarity, color, smell and taste. In this study, a quantitative measure is only the choice when the indicator can be quantified.

Mostly quantitative indicators are employed in measurements of outcomes, including impacts (effectiveness). Opinion in the society can be evaluated quantitatively or qualitatively as an indicator of outcomes. In this study one indicator of collective opinion about water service performance from water users was quantitatively calculated from responses to a questionnaire. But other opinions about this performance were gathered from water users through open questions in interviews and were evaluated and aggregated qualitatively. A narrative story can reveal and explain interconnections among various variables. Qualitative information often enriches the explanation of quantitative measures. So in this study both quantitative and qualitative information is used systemically in describing performance measurement.

Recognising the context of qualitative information is essential to this study, because performance indicators are just a means and need to be explained. A performance indicator is not a ' hands off" instrument, and only provides information about performance (Carter, 1989, p. 209). They only function as a tin opener; it is then the task of analysts to put meaning on what is inside. The information provided by a performance indicator cannot be used without further explanation. People are still needed to analyze and use performance indicators for organizational improvement, because performance indicators by themselves do not directly improve organizational performance. As Reid (2000, p. 1) mentions, the function of performance indicators is to link between strategic issues, which are the main concern of policy makers, and operational matters, the main concern of those who implement them. In this case, performance indicators can be considered as organizational tools to make sure those decision-makings and goals being well translated and implemented at operational levels.

The same situation in reporting performance indicators in private businesses also apply to the public sector where "performance information can inform or perhaps guide decision making and accountability, but it can not direct and should not replace decision making and accountability" (Mayne & Goni, 1997, p. 17). Decision-makers and society must critically analyze performance information, and creatively use it for accountability. The quality of indicators made available is also essential as Jackson (cited by Ball, 1998, pp. 56–57) states criteria for performance indicators: consistency, comparability, clarity, controllability, contingency, comprehensive, bounded, relevant and feasible.

There are some valid reasons for an organization to be not totally accountable for its performance, since it has incomplete control over some performances which are measured and show up in particular performance indicators. However, several aspects should be managed and not accepted as valid reasons for an organization not performing well. As Carter (1989, p. 209) says, an organization may not perform well because of some factors: unclear performance ownership; ambiguous goals; unsupported management styles; insufficient information system; uncontrolled inter-governmental relationship; and unbalanced relationships between professionals and

administrators. These should not be acceptable reasons.

Furthermore, in performance reporting a large number of performance indicators may be reported but the performance information they provide may not cover indicators needed for evaluating social and environmental goals. The dilemma is that collecting and reporting each item of performance information normally has a cost but not all stakeholders are interested in all of the same information, with perhaps even some preferring they or others not know about particular information. In the case of water supply service provision, many performance indicators have been developed by water institutions which use them to serve their own measurement intentions, not necessarily representing wider society interests in evaluating social and environmental justice.

METHOD

This research uses a qualitative approach. A focus of this research is to develop a model of Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality. A locus of this research is water supply enterprises as the research object. Primary and secondary data are collected to develop the model. Interview, observation and documentation are the data collection method.

RESULTS AND DISCUSSIONS

A model of Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality are developed, based on the basic model of an Outcome Performance Measurement Web. Performance indicators in the water supply sector have been developed for various purposes. Four sets of performance indicators are presented in Table 1 below:

Two are from international institutions; the International Water Association (2000) and the World Bank (2002). The other two are from national institutions; the Indonesian Home Affairs Department (IHAD, 1999) and the Indonesian Drinking Water Supply Local Enterprise Association (PERPAMSI, 2003a). The Indonesian IHAD performance measurement system has been applied regularly to 280 PDAMs since 2000. The other Indonesian system has been developed by PERPAMSI and published in 2003, but not been applied nationally.

As can be seen, only a small number of performance indicators from the four institutions provide information that can be used to evaluate social equity (IHAD 11, 12, 13, 18; PERPAMSI KPI 4, KPI 5, KPI 6, KPI 8, KPI 9, SPI 8; World Bank 1, 2, 15, 16, 20, 22; and IWA 11, 12, 15, 16, 17, 18) and environmental concerns (World Bank 17). These indicators are still too general and need additional indicators or further information if an analysis of measurements on the indicators is to be effective in evaluating social and environmental outcomes. For example, none of these price indicator: tariff revisions (KPI 4) and ratio of social charges directly relate to ' poor households'. Also, a larger number of performance indicators do not automatically provide the comprehensive information wanted for particular evaluations, and collecting and reporting many indicators can be costly. IWA, for example, besides the 26 indicators listed here, suggests the collection of an additional 106 performance indicators! (Alegre et al., 2000, p. 7).

These sets of indicators were developed to measure performance for certain purposes as intended by these institutions. Unfortunately, the four performance indicator systems do not fully provide a set of indicators that can be used to adequately evaluate social and environmental outcomes of a water supply service as intended by this study. As demonstrated in the further analyses, a combination of fewer indicators can be used to measure and indicate whether or not a water supply enterprise is working in the direction of increasing social equity and environmental sustainability. These four performance indicator models are critiqued, and a new performance indicator system developed for developing Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality the current system.

The first finding is that interconnections between indicators do not operate only from one side of organizational aspects to the other, but can also happen within one side. These performance indicators are interconnected in iterative processes. An indicator is considered as a dynamic entity rather than a static one as the normal way of systems thinking appears to see the world (Senge, 1990, p. 68). An indicator has a multiple function including such as operating as

Table 1. Performance Indicators for Water and Sewerage Supply Service in Four Institutions

IHAD	PERPAMSI[1]	WORLD BANK	INTERNATIONAL WATER ASSOCIATION
FINANCIAL INDICATORS	FINANCIAL INDICATORS	1 Water Coverage	WATER RESOURCE INDICATOR
1 Return on Net Fixed Assets	KPI 1 Operating Cost Ratio	2 Sewerage Coverage	1 Inefficiency of use of water resources
2 Return on Selling	KPI 2 Debt Service Ratio	3 Water Production	PERSONNEL INDICATOR
3 Liquidates	KPI 3 Current Ratio	4 Water Consumption	2 Employees per connection
4 Debt Equity Ratio	KPI 4 Tariff Revision	5 Metered Water Consumption	PHYSICAL INDICATOR
5 Solvability/Solvency	SPI 1 Total Cost Recovery	6 Uncounted for Water	3 Treatment utilisation
6 Operating Ratio	SPI 2 Return on Net Fixed Assets	7 Proportion of connections metered	OPERATIONAL INDICATORS
7 Return on Long Debt Ratio	SPI 3 Unit Operational Costs	8 Proportion of water sold metered	4 Mains rehabilitation
8 Net Fixed Asset Ratio on Water Income	SPI 4 Labor Costs Ratio	9 Pipe Breaks	5 Service connection rehabilitation
9 Debt collection period	SPI 5 Energy Costs Ratio	10 Sewerage Blockages	6 Water losses & real losses
10 Effectiveness of Water Charge Collection	SPI 6 Average Water Charges	11 Unit Operational cost	7 Main failures
OPERATIONAL INDICATORS	SPI 7 Collection Period	12 Staff/'000 conn. or water pop. served	8 Service connection failures
11 Coverage	SPI 8 Ratio of Social Charges	13 Labor Costs Ratio	9 Customer reading efficiency
12 Drinking Water Quality	SPI 9 Ratio of Commercial/ Industrial Charges	14 Contract out service costs per op. costs	10 Residential customer reading efficiency
13 Continuity	SPI 10 Debt Equity Ratio	15 Continuity of Service	11 Water quality tests performed
14 Water Production Productivity	SPI 11 Average Age of Tangible Assets	16 Complaints W&S Services	QUALITY SERVICE INDICATORS
15 Uncounted-for Water	CUSTOMER INDICATORS	17 Wastewater treatment	12 Household and business supply coverage building
16 Metering service	KPI 5 Customer Satisfaction	18 Average Water Charges	13 Supply coverage
17 New Connections	KPI 6 Coverage	19 Total revenue per pop served/GDP	14 Population coverage
18 Ability to handle complaints	SPI 12 Unused Capacity	20 Residential Fixed Charge	15 Public taps and standpipes
19 Service point centre/customer service unit	SPI 13 Service Area Ratio	21 Ratio of Commercial & Industrial Charges	: (distance to households & water consumed
20 Connection ratio per 1000 Employees	SPI 14 Water Meter Changing	22 Connection Charge	16 Continuity of supply
ADMINISTRATIVE INDICATORS	API 17 Payment Ability	23 Collection Period	17 Quality of supplied water
21 Corporate Plan	TECHNICAL INDICATORS	24 Working ratio	18 Service complaints & billing complaints
22 Org Job and Distribution	KPI 7 Uncounted-for Water	25 Debt Service Ratio	FINANCIAL INDICATORS
23 Standard Operational Procedure	KPI 8 Water Quality Index	26 Investment	19 Unit running costs
24 Built Drawing	KPI 9 Continuity	27 Net Fixed Assets/inanita	20 Unit capital costs
25 Performance Valuation Standard	SPI 15 Operating Primer Meter		21 Average water charges for direct consumption
26 Budget and Work Plan	SPI16 Pipe Rehabilitation		22 average Water charges for exported water
27 Internal Report	HUMAN RESOURCE INDICATORS		23 Total cost coverage ratio
28 External Report	KPI 10 Employee Satisfaction		24 Operating cost coverage
29 Independent Auditor Opinion	SPI 18 Connection Ratio per Employee		25 Contribution of internal sources to investment
	SPI 19 Training Cost		Current ratio

[1] KPI = Key Performance Indicator and SPI = Supplementary Performance Indicator

an input, output/intermediate outcome or impact for other indicators.

The second finding is about water quantity. A water coverage indicator is employed in the four indicator systems above. This indicator provides information about the proportion of inhabitants being served by the water supply service or people with access to piped water. This indicator is more useful if it is combined with information about water-borne diseases in various sub-areas (Diagram 1). The water supply service performance can then be evaluated in terms of how far the service outcome affects the quality of life of people, especially public health.

Some people who have not been connected with piped water from the water supply company must consume water such as well water with a low water quality compared with piped water that is well protected and regularly monitored its quality. These people face a risky experience with water-borne dis

eases. So it might be that people in a sub-area which is served with a high level of the water supply service connections will be found to have a low case of water-borne diseases, and conversely, which would indicate a connection between water coverage level and public health concerns (Diagram 1).

A water coverage indicator for Indonesian PDAMs is defined as the ratio between the total number of the population served by the water supply enterprise and the total population (IHAD, 1999, p. 7). A water coverage indicator placed on the output side in Diagram II.3 is related to the other three indicators on the input side; production capacity, idle capacity and uncounted-for water (UfW). A failure in reducing idle capacity and UfW can cause a reduction of water production, and fewer people can be covered with the piped water service (accessibility).

The third finding is about water pressure and continuity. IHAD (1999, p. 9) suggests that a continuity of water supply service flow 24 hours per day to customers and a high water pressure be the standard of water supply delivery. Water pressure and continuity alongside water coverage for water customers is preferably reported in more detailed information or broken down into various customer group categories (see Diagram II.3 above). This information would be useful to evaluate what types of customers receive a better or less service in terms of water availability and reliability.

A low performance of water supply service provision can make water customers also use alternative water such as well water, as would some people that have not been served by being connected to piped water. As Johnston and Wood (2001, pp. 5-6) mention, consequences for the poor household due to a lack of access to an adequate and affordable water supply service include increased monetary costs in

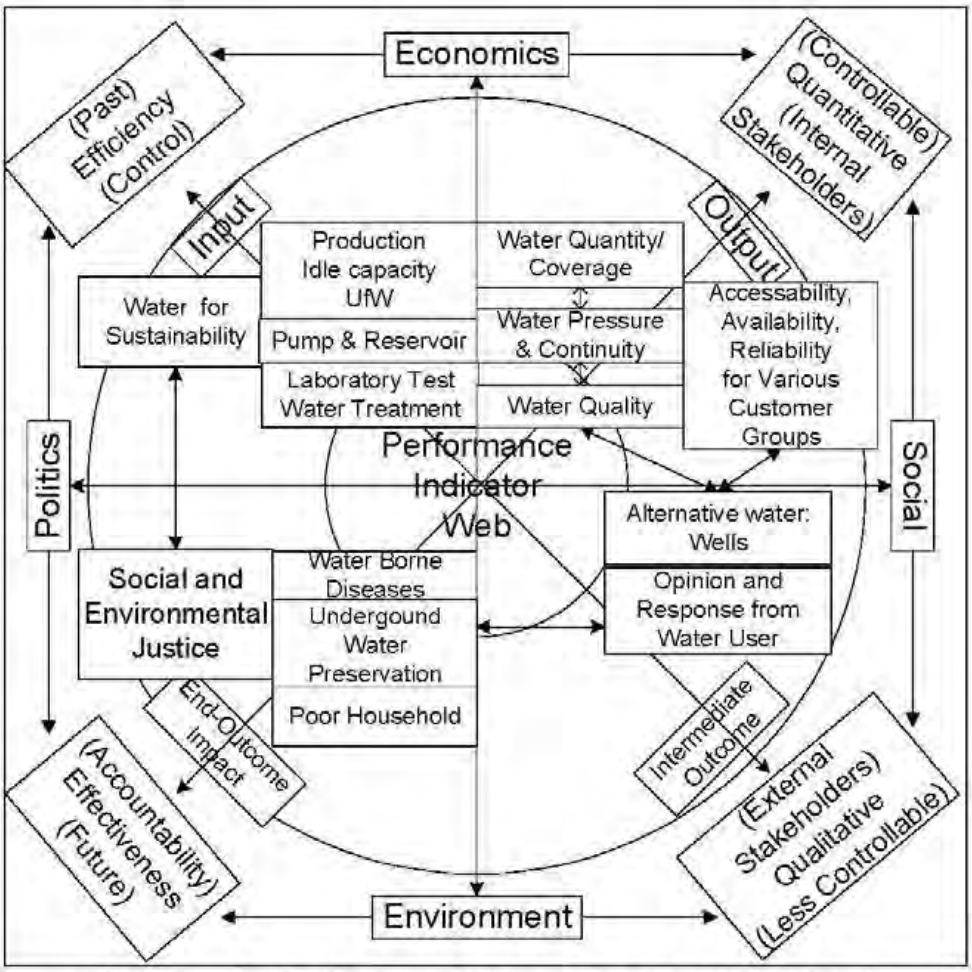

Diagram 1. Finding a Model of Outcome Performance Indicator Web of Water Quantity, Pressure, Continuity and Quality

getting alternative water; increased time and physical effort needed in collecting water; reduced water consumption levels; increased health burdens; and economic costs in terms of lost productivity such as taking time off work due to illness.

Moreover, the environmental consequences due to uncontrollable uses of groundwater through wells include the degradation of groundwater reservation, as mentioned previously in the second critique. Johnstone and Wood (2001, p. 6) describe how the overuse of groundwater in the urban area in turn can affect the urban water users through reduced availability and increased pumping costs, and an environmental effect of land subsidence and saltwater intrusion. This would be an indication of the degradation of environmental quality.

The fourth finding is about water quality. It is preferable that sampling test results of water quality be made available for people who want to know about the quality of the water supplied to the society (see Diagram II.3 above). This condition could press water supply enterprises to perform well and to improve their services by producing and distributing quality water. The test results on piped water could be compared with the results for well water. Well water is generally lower quality than piped water that is well protected and controlled in the process of distribution. As discussed in the third critique above, some people who have not been served with piped water use well water. If cases of water-borne diseases are more frequently found in an area with a lower coverage or connection to piped water, this would be an

indication that cases of water-borne diseases can be reduced by serving more people with piped water.

CONCLUSION

Generally, a progress of measuring public sector performance in the Indonesian is still behind several developed countries such the UK, the USA, and Australia have been nationalizing their outcome based performance measurement through national charters, legislation and institutional building. In Indonesia, performance measurement systems for Indonesian PDAM have been being developed, although tasks in measuring the PDAM performance is still traditionally held by public auditors and reported only to governmental institutions and not publicly.

In the future, if reports of public auditors on the PDAM performance will be published publicly and elements of society will be given a legitimated right such as in a public regulation to access information about PDAM performance and to do their own evaluation in this concern, they will still have some difficulties in measuring the PDAM performance which is based on outcomes of the water supply social and environmental goals. As a small number of social indicators, a lack of environmental indicators and a lack of a group of social and environmental indicators in the four performance measurements systems: IHAD, PERPAMSI, World Bank and IWA can be used to evaluate the outcomes of social and environmental goals of water supply provision. These organizations overall prioritize the evaluation of economic goals of water supply service performance rather than the social and environmental goals. Balancing between economic, social and environmental goals is the important thing to do as highlighted by several authors.

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