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Report of Performance Indicators

African Water Supply and Sanitation Utilities 2001

Final Report - Updated to December 2001

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WATER UTILITY PARTNERSHIP

SPBNET.AFRICA

REPORT OF PERFORMANCE INDICATORS

AFRICAN WATER SUPPLY AND SANITATION UTILITIES 2001

FINAL REPORT – UPDATED TO DECEMBER 2001

WRc Ref: UC3955
DECEMBER 2001

DFID Department for International Development

The Department for International Development (DFID) is the UK government department responsible for promoting development and the reduction of poverty.

The central focus of the government's policy, set out in its first White Paper on International Development in 1997 is a commitment to the internationally agreed target to halve the proportion of people living in extreme poverty by 2015, together with the associated targets including basic health care provision and universal access to primary education by same date. The government's second White Paper on International Development, published in December 2000, reaffirmed this commitment, while focusing specifically on how to manage the process of globalisation to benefit poor people.

DFID seeks to work in partnership with governments which are committed to the development targets, and seeks to work with business, civil society and the research community to encourage progress which will help reduce poverty. We also work with multilateral institutions including the World Bank, United Nations agencies and the European Commission. The bulk of our assistance is concentrated on the poorest countries in Asia and sub-Saharan Africa.

Amongst DFID's priorities to achieve the development targets are a substantial improvement in people's access to clean water and appropriate sanitation. The Water Utilities Partnership (WUP) has these priorities as their goal and DFID is pleased to be a partner and supporter of WUP's work.

SPBNET.AFRICA

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AFRICAN WATER SUPPLY AND SANITATION UTILITIES 2001

FINAL REPORT – UPDATED TO DECEMBER 2001

Report No.: UC3955

December 2001

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FOREWORD

Building on the lessons and achievements of an earlier trial performance indicators project, the Water Utility Partnership for Capacity Building in Africa (WUP) launched SPBNET.Africa in September 2000. Since then we have held workshops throughout Africa to define and refine the questionnaires and to determine the structure of this project. A total of 110 utilities submitted data for inclusion in the database which is presented alongside this report.

It is my great hope that the data generated by this project will be of use to participants in identifying those areas of operation where there is the potential for performance improvement. I hope that the data will be of use not only to direct utility participants but also to Government policy makers, regulatory agencies, NGO's and financial institutions.

The value of much of the information presented in this report will increase when trends can be established over time. It is therefore my hope that the process of performance evaluation will continue from year to year, building a bank of data available to all participants, and enabling participants to monitor their progress against the benchmark target in each area.

I therefore trust that all participants will realise value from their participation in the current effort and that we can count on your support in the future.

Dennis Mwanza

Managing Director

Water Utility Partnership

ACKNOWLEDGEMENTS

The Water Utility Partnership (WUP) would like to thank all the utilities that took time to participate in this project, including attending the regional workshops (sometimes at short notice) and filling in questionnaires. The list of participating utilities is given in the Glossary. Indeed the fruits of your labour are being realized and are hereby presented in this report.

The WUP would be failing in its duties if it did not thank the guidance support provided by WRc plc of the United Kingdom through Mr. Stephen Ramsey and his team. Sometimes WUP was impatient in putting in so many demands but this was always received with great patience.

The project received the overwhelming response more due to the personal efforts by the Project Manager (Mr Bill Wandera of Aquaconsult, Uganda) and the Regional Consultants listed below. Through their inspiration the utilities were encouraged to participate in the project.

- Mr Edwin Nyirenda, Zambia covering the Southern African Region (2)
- Mr Cecil Chibi of South Africa covering the Southern African Region (1)
- Mr Linus Materu of Tanzania covering the all the East African Countries
- Mr Godefroy Chekete of Benin, covering the West African French speaking Countries
- Mr Mohamed Larbi Khrouf of Tunisia covering the North African utilities
- Mr Mohamed Iliyas of Nigeria covering the West African English speaking Countries
- Dr Johnson Oguntola of Chad covering the Central African Countries including Madagascar and Djibouti

WUP is grateful for their support in the implementation of the project.

The support from the Department for International Development of the British Government cannot pass unnoticed. WUP is continually indebted to DfID for immense support both in terms of financing the project and advisory services through Mr. Ian Curtis and Mr. John Davies.

A small group that silently but effectively guided the project was the Quality Assurance Committee consisting of five persons. The WUP expresses its gratitude to the following QAC members for their support.

- Mr John Davies representing the Department for International Development, UK
- Professor Enrique Cabrera from Spain representing the International Water Association
- Mr. Dominique da Cruz from SODECI, Côte d'Ivoire representing the Union of African Water Suppliers.
- Mr Bill Kingdom, Washington, representing the World Bank
- Mr Manuel Alvarinho President of the Water Regulatory Commission of Mozambique representing regulators

Lastly but not least WUP is grateful to the secretariat for the efforts in ensuring that all the logistical support was provided. Specific mention is made of Mrs. Maferima Toure (*Deputy Director of the WUP*) who always was available to ensure that the workshops were held without hitches. Ms Gislaine Milimouno was responsible for coordinating the database in Abidjan. Her support is greatly appreciated.

1. INTRODUCTION

1.1 Background to WUP

The Water Utility Partnership for Capacity Building in Africa (WUP) is a joint initiative between the Union of African Water Suppliers (UAWS), based in Cote d'Ivoire, the Regional Center for Low Cost Water and Sanitation (CREPA), based in Burkina Faso, and the Centre for Training, Research and Networking for Development (TREND), based in Ghana. The partnership was established in 1996, with the support of the World Bank. The partnership is based in Cote d'Ivoire.

The ultimate goal of the WUP programme is to increase the coverage of water supply and sanitation services and to improve the quality of services through increased investments and reform of utilities.

The programme has a number of main objectives of which the following are particularly applicable to the SPBNET.Africa project: -

- Improving the performance of water supply and sanitation utilities in Africa in terms of service delivery, cost recovery, operation and maintenance
- Fostering collaboration between Water Supply and Sanitation Utilities, community based organisations and Non-Governmental Organisations and strengthening their capacity to improve service
- Building capacity of institutions and professionals by making full use of the experience of successful African Water Supply and Sanitation Utilities

The WUP programme currently includes five main projects:

- Project 1 – Reform of the Water and Sanitation Sector in Africa
- Project 2 – Performance Indicators and Benchmarking
- Project 3 – Utility Management and Reduction of Unaccounted for Water
- Project 4/5 – Provision of Services to the Urban Poor
- Project 6 – Dissemination of WUP Products

1.2 WUP Project 2 – Performance indicators and benchmarking ("the PI project")

WUP was established in recognition that the key to significant progress in water and sanitation service provision rests with the improved performance of the water and sanitation providers, and in realising that well functioning water and sanitation utilities are the best models and providers of help for less experienced ones. Underlying this is the knowledge that not only does the continent of Africa provide a range of well functioning utilities but also, to a large degree, holds the key to best practice for application within the region.

The main role of the project is to provide a management tool for self evaluation for the operators, benchmarking for utilities with similar operating environments, promoting experience sharing between the utilities and documenting and sharing information on emerging best practices and lessons on water supply and sanitation. It will also promote accountability and transparency in the operation of the utilities leading to higher efficiency and effectiveness.

A project workshop was held in February 1997 to identify the kind of data that could be included in a questionnaire for data collection as well as the major performance indicators to be considered. A test questionnaire was issued to utilities between April and August 1997, followed by workshops in October 1997 and February and July 1998 with a view to raising awareness of the project.

Fifteen utilities from fourteen countries completed the questionnaire but it became apparent that most had difficulties with providing information in the required format, and the questionnaire was subsequently revised.

In summary the questionnaire was sent to thirty utilities, of which ultimately twenty-one voluntarily submitted returns. Of these, ten utilities provided data which was adequate for inclusion in the comparative analysis in 1998. Nine utilities provided data for the revised questionnaire exercise in 1999.

The trial project was reviewed in early 1999 and the following conclusions were drawn in support of developing the project further: -

- Support had been identified from a core of twenty utilities and agencies such as World Bank and UAWS
- WUP had been active both in promoting the project and widening the original constituency, through workshops and contacts with utilities and agencies
- The questionnaire used to collect data has been prepared in conjunction with participating utilities facilitating buy-in to the project
- Whilst delivery by utilities had been very mixed a number had been extremely thorough in their participation

A general recommendation was that the questionnaire should be widened in scope but that it should retain an elemental simplicity.

1.3 Water supply and sanitation service provider performance indicators and benchmarking network – SPBNET.Africa

1.3.1 Project objectives

The case for extending the original PI project was made on the basis that there was little information available to utility managers to allow them to compare their performance and identify areas for improvement.

"Well run utilities have clearly defined and up-to-date set objectives and action plans for improving their service through monitoring their performance. Such monitoring is targeted at

lowering unnecessary production and distribution costs, enhancing billing and revenue collection, improving customer relations, reducing unaccounted-for-water and generally increasing the level of service. Unfortunately many utilities in Africa are not run as such. In fact, many of them rarely collect data systematically to assess their own performance in order to design operational improvements. As a consequence, both those responsible for service delivery, and those willing to support them, lack the information needed to design measures and investments to improve the delivery of service. There is therefore a need to address this weakness"
- Water Utilities Partnership, Performance Indicators of Some African Water Supply and Sanitation Utilities, January 2000.

The current project, referred to as Phase 1, is funded by the UK Department for International Development (DFID).

The overall aim is improvement in the service providers' management of service delivery through the establishment, application and dissemination of generally accepted performance indicators.

The end is not, therefore, the collection of metric data or the calculation of performance indicators, but rather the identification of performance gaps, benchmarking against superior performers and the implementation of performance improvements.

1.3.2 Project organisation

The project is led by the Project Director who is the Managing Director of WUP, and managed on a daily basis by a locally appointed Project Manager. The Project Manager is supported by seven Regional Consultants, geographically spread throughout the region and each with an identifiable constituency. The Regional Consultants are the primary interface between the project and the participating utilities.

Regional Consultants are also responsible for the distribution of questionnaires and the co-ordination of all queries and for data collection and submission of questionnaires.

The Project Manager is supported throughout the project by a Benchmarking Advisor, providing expert advice on data collection, database development and benchmarking.

The project is overseen by a Quality Assurance Committee comprising representatives of WUP, DFID, World Bank, International Water Association (IWA), a regional utility and a regional regulator.

1.3.3 Project implementation

The project is being implemented through a two tier approach, namely (i) the development of a questionnaire largely based on the substance of the PI project to a significantly greater number of participants with a wider geographic spread, and (ii) the development of a trial questionnaire expanding the original range of questions to cover sanitation, social, economic and environmental issues, for use by the original participants (the core utilities).

The project has developed around a series of workshops: -

- A first Regional Consultants workshop to develop the questionnaires and plan a series of regional workshops

- A first series of regional workshops to introduce the concept of benchmarking, to review the questionnaire and to launch the data collection process

- A second Regional Consultants workshop to review the project outputs and to assess experiences and lessons from the project

- A core utilities workshop to assess the suitability of the extended questionnaire and to agree appropriate amendments for later wider use

- A second series of regional workshops to disseminate the results of Phase 1 and to promote further development of the project

1.4 Development of performance indicators

To date, a major component of the SPBNET.Africa project has been the identification and definition of indicators for use in the questionnaires. This is a key issue for a number of reasons: -

- Ultimately this defines the data available for comparative purposes, and is therefore the basis upon which utilities can benchmark one with another

- It is essential to balance what is desirable with what is achievable in terms of what data and information is sought

- It is also essential to strike a balance between broadening the questionnaire to include a wider range of issues and maintaining an elemental simplicity

- Lastly it is advisable either to make use of existing performance indictors and definitions where this is possible rather than "re-inventing the wheel"

This process commenced with a detailed review of major existing performance indicator schemes and projects to identify how and why they have identified particular ranges of indicators and later which of those could be applicable to the project. The review covered indicators utilised by IWA (International Water Association), World Bank, Asian Development Bank, UNICEF, WHO, OFWAT (Office of Water Services, England and Wales), HABITAT, and the SAAWB, (the South African Association of Water Boards), amongst others, as well as the indicators used in the original project.

The selection of indicators was reviewed and amended by the Regional Consultants, the Project Manager and WUP Director, DFID, and by participating utilities at the first regional workshops. It has not been possible to accommodate all of the requested changes or to include all of the information and indicators suggested. What has evolved is a questionnaire system based heavily on the original, tested questionnaire (issued as the Water Only questionnaire) and a full questionnaire developing a range of other issues in the areas of water, sanitation, environment and social responsibility. The additional indicators sought are not exhaustive and were trialled only by a small group of original participants (the core utilities). The results are presented alongside the results from the Water Only questionnaire. Some amendments have been suggested for future use but it is anticipated that all

participants will be requested to complete the full questionnaire in the next and subsequent years.

1.5 Summary

- The purpose of data collection and the calculation of performance indictors is to facilitate benchmarking, that is to identify a utility's performance relative to that of the best performer, to assess the "performance gap" and, based on the implementation of best practice improvements, to measure improvements in performance. Collection of data is not an end in itself.

- Where it is anticipated that data will not be readily available it is important to be able to justify the investment in systems or simple data collection costs relative to the value of the indicator and its potential benefit to performance.

- It has not been possible to verify data or information as would have been the case if data audits were carried out. Indeed it has not been possible to have first hand interface with every utility. Sense checks were built in to the data software so that inconsistent answers were immediately excluded. The overall comparative exercise is only as good as the data which is input. Data has been reviewed by a regional consultant, who has a better knowledge of the levels of performance to be expected from a particular utility, and comparatively by the project team. Lastly, data is subject to peer review on a comparative basis.

- Incorrect data may be supplied due to carelessness, unavailability of data, inaccuracy of data systems or the desire to appear better.

- A grading system has been in-built so that participants can identify the quality of data, allowing a classification range between audited to best estimate. Contrary to the elimination of data this may encourage the inclusion of qualified data where firm data is not available.

- It is likely that any region will contain examples of good and bad performance. The good may or may not be world class performance but nevertheless open the possibility of performance improvement for others. Good performance within the region may provide the most directly transferable experience as well as support for implementation.

- Benchmarking can work as a one off exercise but its real benefit is derived from ongoing performance improvement.

- Benchmarking can be the route to significant opportunities for performance improvement based on the identification of best practice and implementation of best practice improvements. It must be conducted in the spirit of openness and honesty with every effort made to generate quality data and to share experiences and knowledge.

2. PERFORMANCE INDICATORS

2.1 Introduction

This report is the final report on information contained in the SPBNET.Africa database. It supersedes the interim report produced in October 2001 and contains all utility information submitted by 21 November 2001. The database (issued in CD format) has also been finalised. The database contains all of the data input and can be read and manipulated in raw data format or graphically.

Questionnaires have been received from 110 African utilities. All data received has been input to the database as received from participants. Where possible, data has been checked and amended.

The sections which follow present the data received for the full range of performance indicators. For each indicator a participant will be able to identify the utility position relative to those of all other utility participants. Simplistically, the best result for any indicator is THE BENCHMARK. In reality, what can be achieved by a utility will depend on its own particular circumstances and indeed the circumstances of the leading utility (known as explanatory factors).

How to use the information presented for benchmarking purposes is developed further in Chapter 6.

2.2 Water and sanitation indicators

Sections 3 and 4 present indicators for water and sanitation respectively and are structured such that, for each indicator, the following is provided:

- Name and reference number of indicator
- Since some of the indicators were included in the full version of the questionnaire but not the water-only version, an indication of whether or not the indicator was in the water-only questionnaire has been provided – out of the 110 utilities, 31 submitted full questionnaires and 79 submitted water-only questionnaires
- How the indicator is calculated
- Narrative:
  - ⇨ Aspect of performance being measured
  - ⇨ Purpose of indicator
  - ⇨ How results compare with UK data (if appropriate)
  - ⇨ Comments on data (e.g. where appropriate, a view is given as to the target level that utilities should be aiming for)

- ⇨ Comments on outliers
- ⇨ How indicator ties in with other indicators

- Graph showing all African utilities' data
  - ⇨ Data from all utilities will be presented in one graph. For the two utilities that have provided more than one year's data (Rand Water and Kaduna State), only the latest year's data is presented. Most utilities' data is from either 1999 or 2000, although there are a few from 1998 and 2001 (the Glossary shows which year's data has been used for each utility as well as providing the key to utilities' short names).
  - ⇨ Outliers are presented as blanks and are referred to in the commentary.

"Indicators" which are not true performance indicators but are merely data items, e.g. number of staff, are not included. This supporting information is presented in Section 5.

When the spreadsheet questionnaires were created, the yes/no questions were structured such that a 1 should be entered to indicate "yes" and a blank indicates "no". The problem with this is: how can we be sure that the user means "no" and has not just overlooked the question? In retrospect, it might have been clearer to force the user to register a "no" answer to be sure that the user actually means "no" rather than "no comment", "don't know" or simply "did not see the question" (this has been rectified for future questionnaires). For the purposes of this report, it is assumed that, for yes/no questions, a blank means "no".

In addition, for numerical fields, the database is unable to distinguish between genuine zeros and cells left blank (again, this has been rectified for future questionnaires). This causes problems for those fields where a zero response is meaningful, e.g. percentage failed water quality samples. For the purposes of this report, a blank field has been interpreted as a zero.

The questionnaire and notes utilised in the data collection exercise are included in Appendices A and B respectively. Further details on the method of calculation and precise definitions are included there.

For the indicators involving currency, the local currency values have been converted into US dollars using the appropriate currency conversion factors (Appendix C contains these factors).

Each utility has been assigned a short name (see the Glossary for the key to these short names).

For the water indicators, all utilities except two (ONAS and ONASdS) supplied data. For the sanitation indicators (section 4), only 12 utilities supplied data - these utilities are listed below. The graphs in section 4 focus on these utilities only.

AAWSA	NCC-WSD
AUWSA	NWSC
CoM	ONAS
DAWASA	ONASdS
LuWSC	RADEEC
LYDEC	SONELEC

3. ANALYSIS OF PERFORMANCE INDICATORS – WATER

3.1 55W: Percentage population served

Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

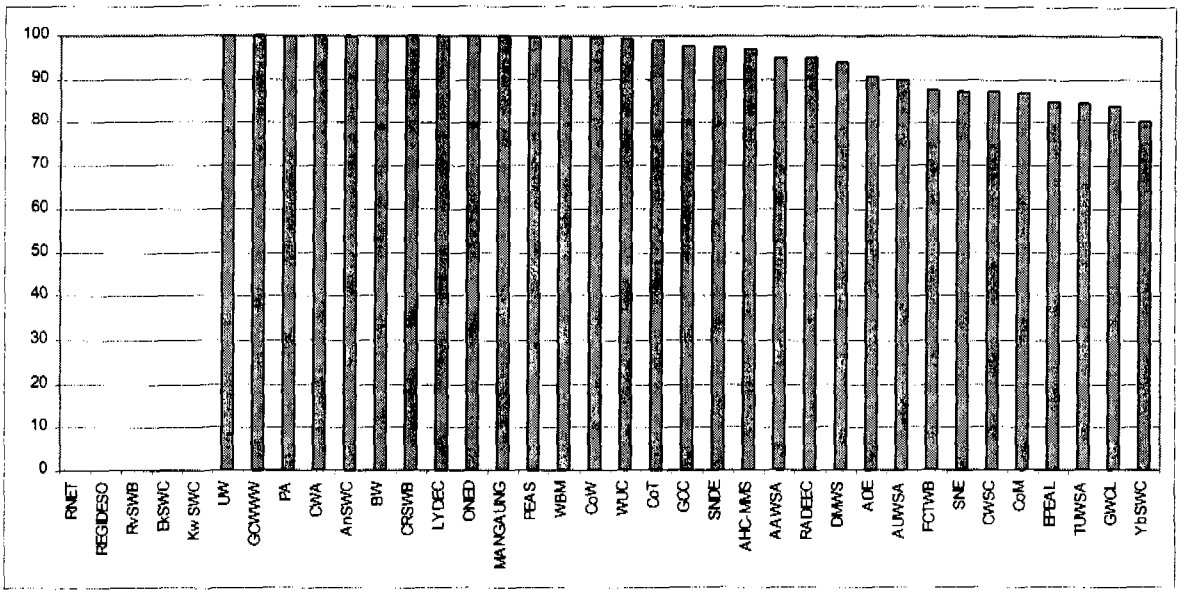
$$\frac{\text{Total no. of persons served}}{\text{Total no. of persons in area of operations}} * 100$$

This indicator represents a measure of the service coverage of the utility. The greater the service coverage, the greater is the utility's service to the local community in providing water supply. Supplementary services such as tankered services are covered in indicator 56W. The indicator measures extent of service but does not measure quality of service (refer indicators 98W, 99W and 100W).

The total number of persons served includes domestic connections, standpipes and persons served indirectly. Persons served indirectly include army barracks, police camps, dormitories and hostels, but does not include tourists or visitors who are not part of the resident population.

Utilities should aim for at least 90% service coverage, but clearly the higher the service coverage, the better. 23 utilities achieved this value. The first 5 utilities on the top graph overleaf are outliers – they all reported values significantly greater than 100%. The last 10 utilities on the bottom graph overleaf either did not provide data or entered zero.

It is anticipated that if a utility only serves the more affluent section of its area, it may have a low service coverage indicator but it also may appear to perform well in the financial indicators such as debtor days and collection efficiency.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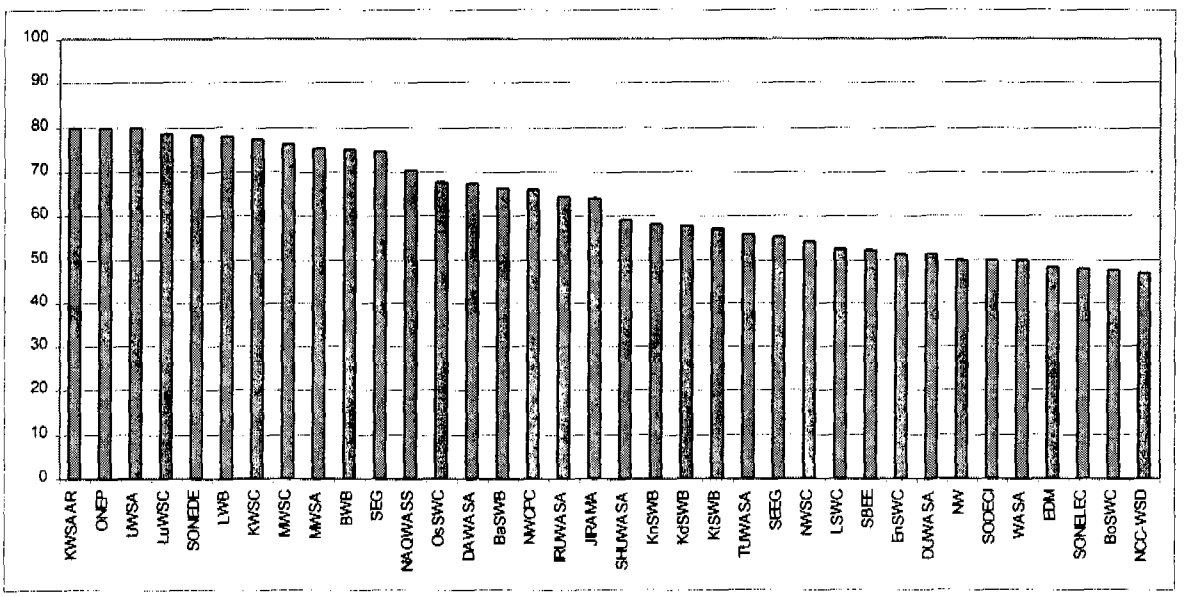
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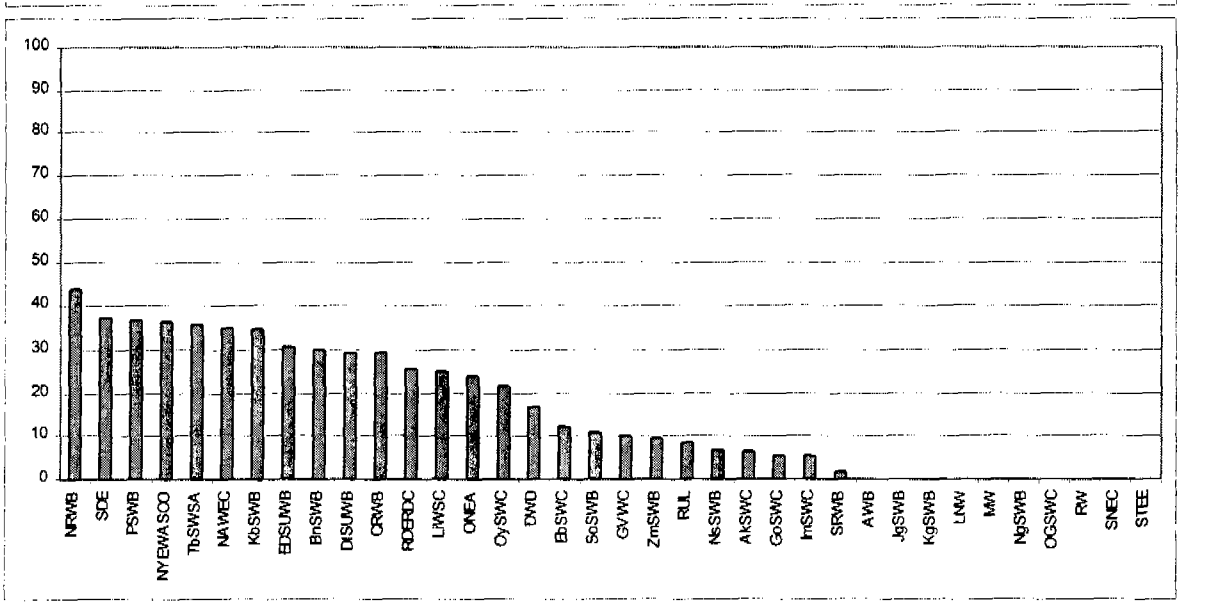
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3.2 56W: Tankered or other supply services to population not directly covered

Included in the water-only questionnaire (Y/N)?	**Y**

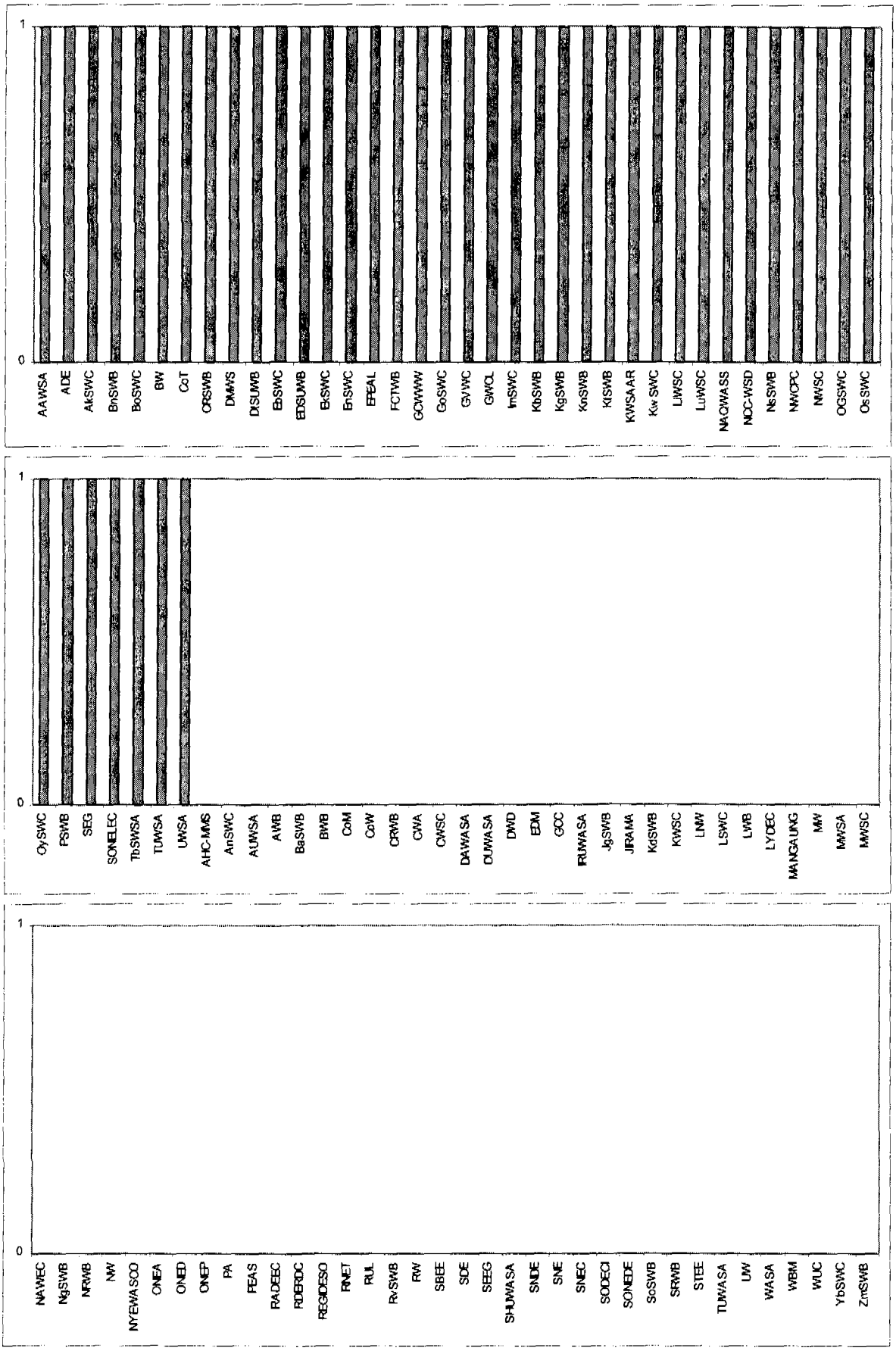
The indicator is simply a Yes/No indicator.

This indicator represents a measure of the service coverage of the utility. Utilities which do not provide direct services to all the resident population may deliver a tankered service to those people not directly served. This indicator seeks to identify such utilities. This indicator should be viewed in relation to 55W so that the two indicators together represent the service coverage of the utility.

Utilities which have a significant population which is not directly served should aim to provide at least a tankered service to such people. Some areas have independent or intermediate suppliers, which need to be monitored and subject to quality control.

In the graph, 1 means "yes" and 0 means "no".

About 40% of utilities confirm that they do deliver a tankered service to those people not directly served. The remainder either do not provide such services or have not responded to the question.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3.3 63W: Percentage increase in domestic connections over the year

Included in the water-only questionnaire (Y/N)?	**N**

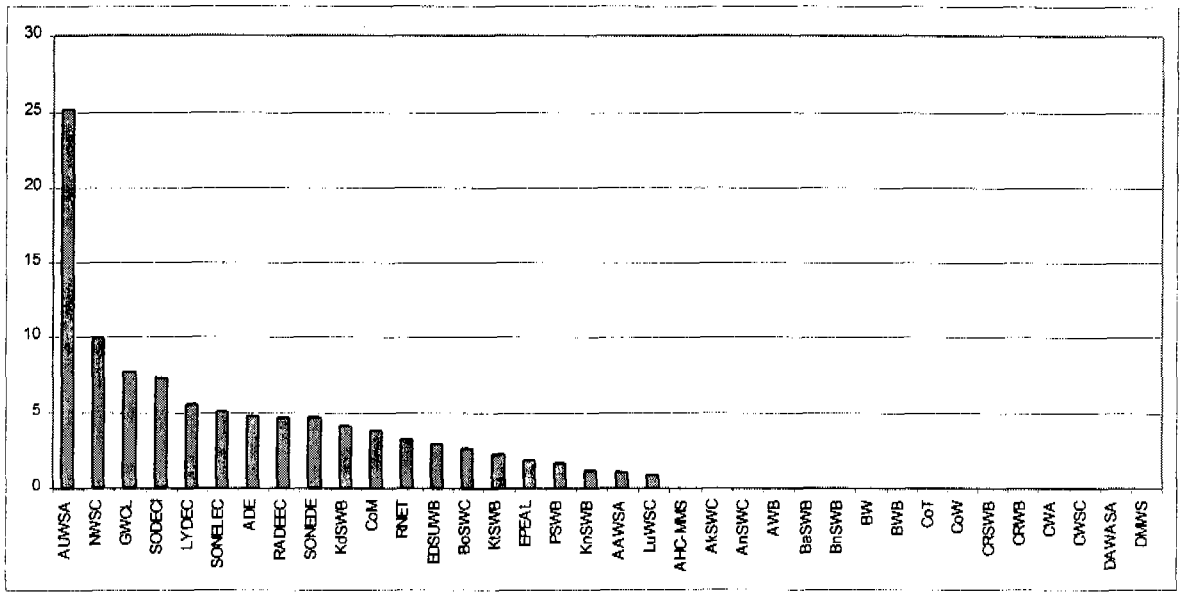
The indicator is calculated as:

$$\frac{\text{No. of new domestic connections during last year}}{\text{No. of domestic connections at start of year}} * 100$$

This indicator represents a measure of the rate of expansion of the system. The greater the value of this indicator, the greater the expansion of the system over the year. Where utilities have a poor existing service coverage (refer indicator 55W), this indicator (along with 69W) will pick up the degree to which the utility is addressing this issue.

For utilities with already high service coverage, it is expected that this indicator will be low since the only expansion opportunities will be through growth in population. However, a utility may have a high service coverage through standpipes rather than through domestic connections, so care should be taken when drawing conclusions.

20 utilities supplied data above zero – the remainder either did not supply data or reported a growth rate of zero. Six utilities reported a growth rate of over 5% with the highest being over 25% (AUWSA). AUWSA now has a service coverage of 90%.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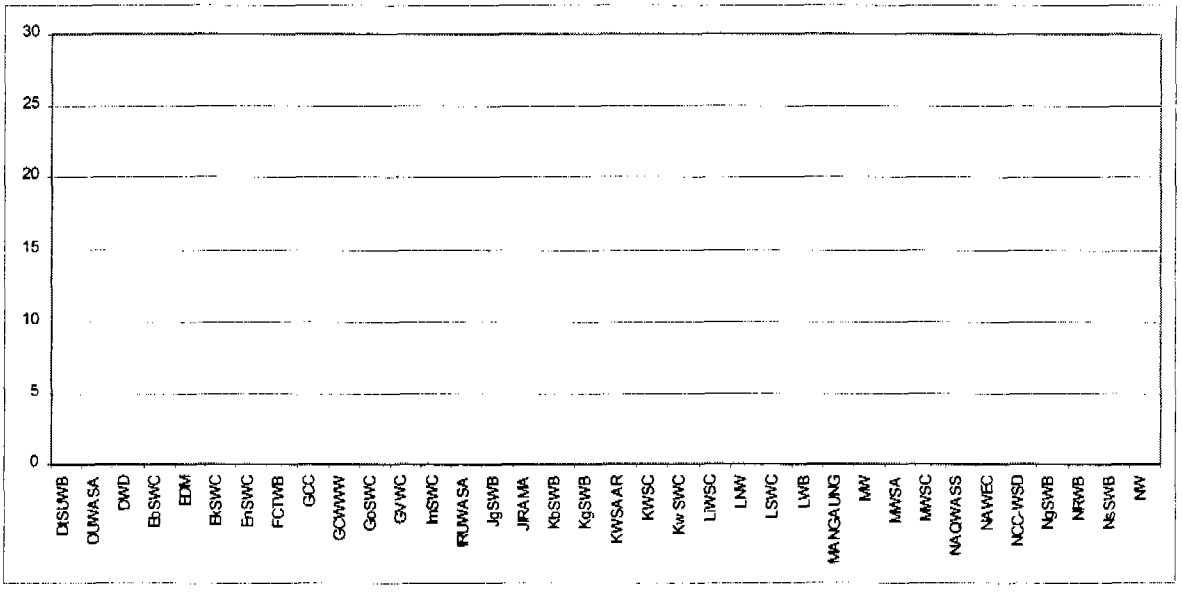
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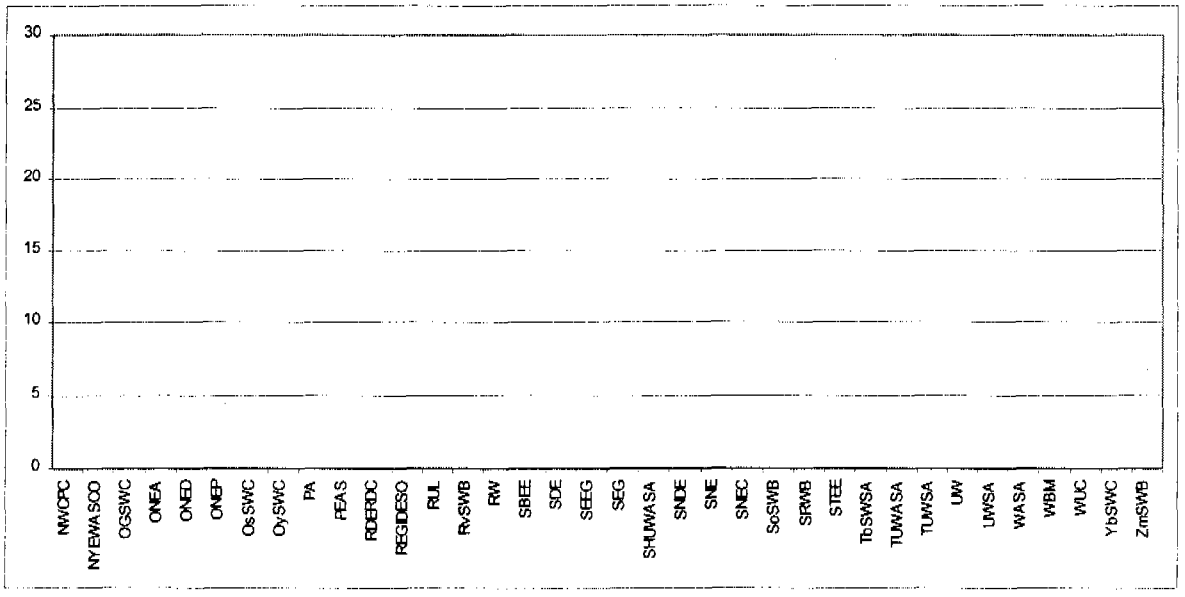
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3.4 69W: Percentage increase in new standpipes over the year

Included in the water-only questionnaire (Y/N)?	**N**

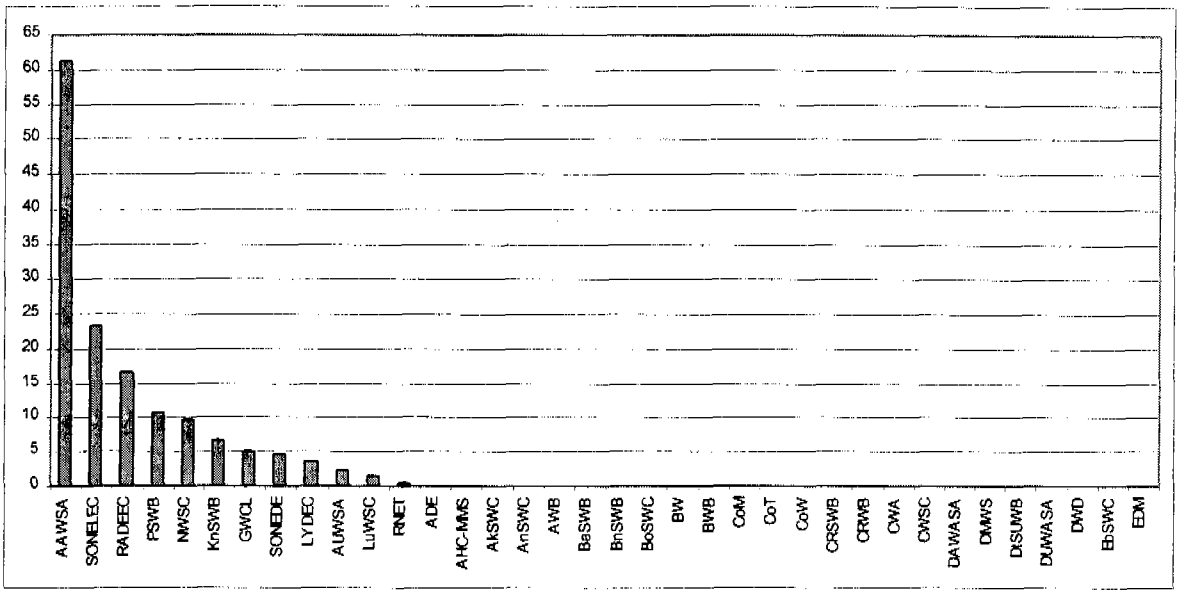
The indicator is calculated as:

$$\frac{\text{No. of new standpipe connections during last year}}{\text{No. of standpipe connections at start of year}} * 100$$

This indicator represents a measure of the rate of expansion of the system. The greater the value of this indicator, the greater the expansion of the system over the year. Where utilities have a poor existing service coverage (refer indicator 55W), this indicator (along with 63W) will pick up the degree to which the utility is addressing this issue.

For utilities with already high service coverage, it is expected that this indicator will be low since the only expansion opportunities will be through growth in population.

Only 12 utilities supplied data above zero – the remainder either did not supply data or reported a growth rate of zero. AAWSA reports the largest figure (over 60%) which implies that the utility has embarked upon a large programme of service coverage expansion through standpipes. AAWSA now has a service coverage of 95%.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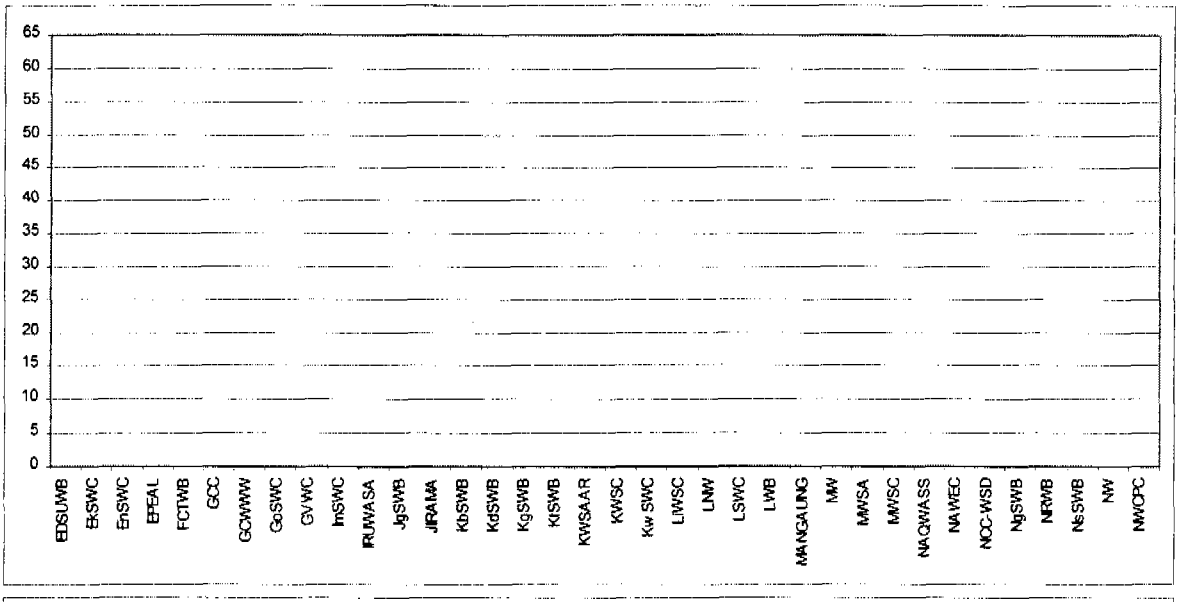
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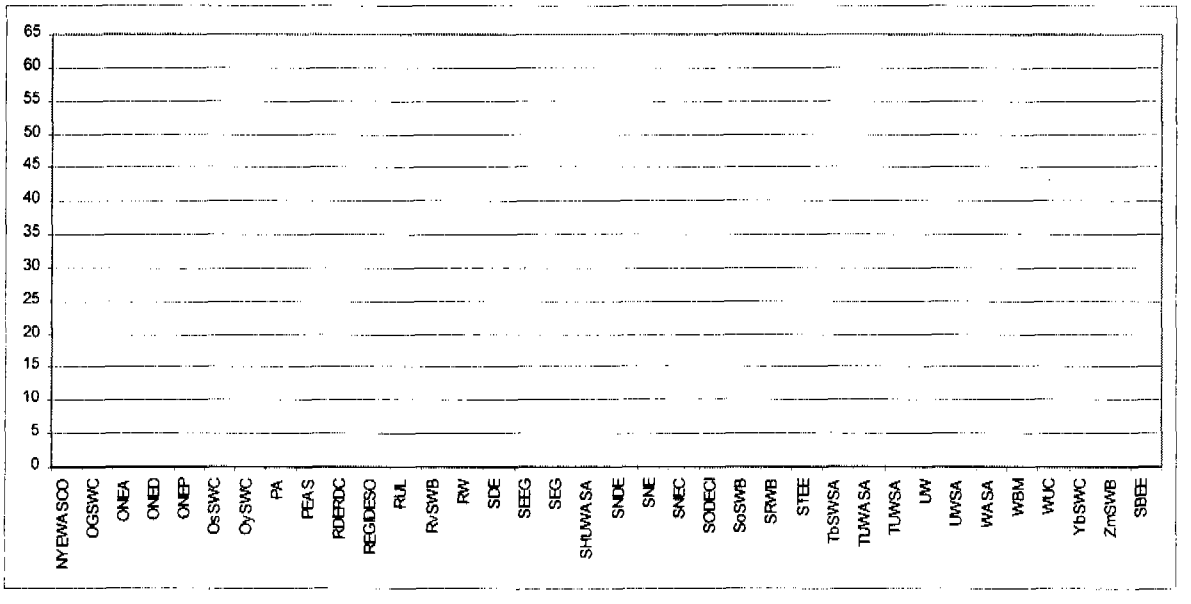
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3.5 71W: Reduced or delayed connection charges to low income households

Included in the water-only questionnaire (Y/N)?	**Y**

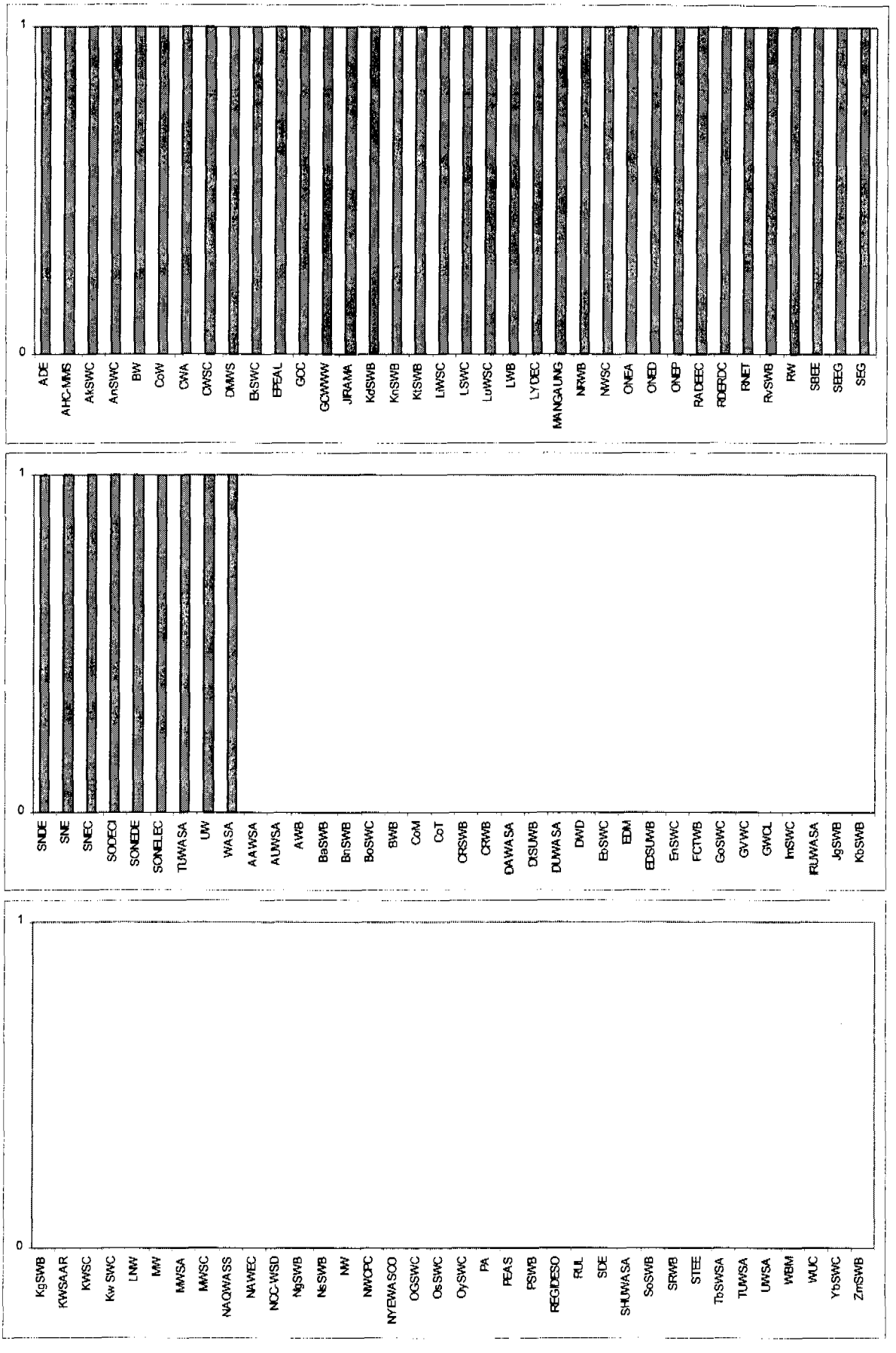
The indicator is simply a Yes/No indicator.

This indicator represents a measure of an aspect of customer service by the utility. Utilities which provide reduced or delayed connection charges to low income households take seriously the need for system expansion in the community and, moreover, are prepared to offer incentives to poorer members of the community to connect to the network.

Clearly this indicator does not assess the extent or effectiveness of the policy of reduced or delayed connection charges to low income households. Such policies may vary greatly in scope and in the level of incentive offered.

In the graph, 1 means "yes" and 0 means "no".

Over 40% of utilities offer reduced or delayed connection charges to low income households. The remainder either do not offer such charges or have not responded to the question.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3.6 77W: Per capita consumption (domestic)

Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

$$\frac{\text{Total annual domestic consumption (litres)}}{\text{No. of domestic connections at year end} * \text{Average no. of persons per connection} * 365}$$

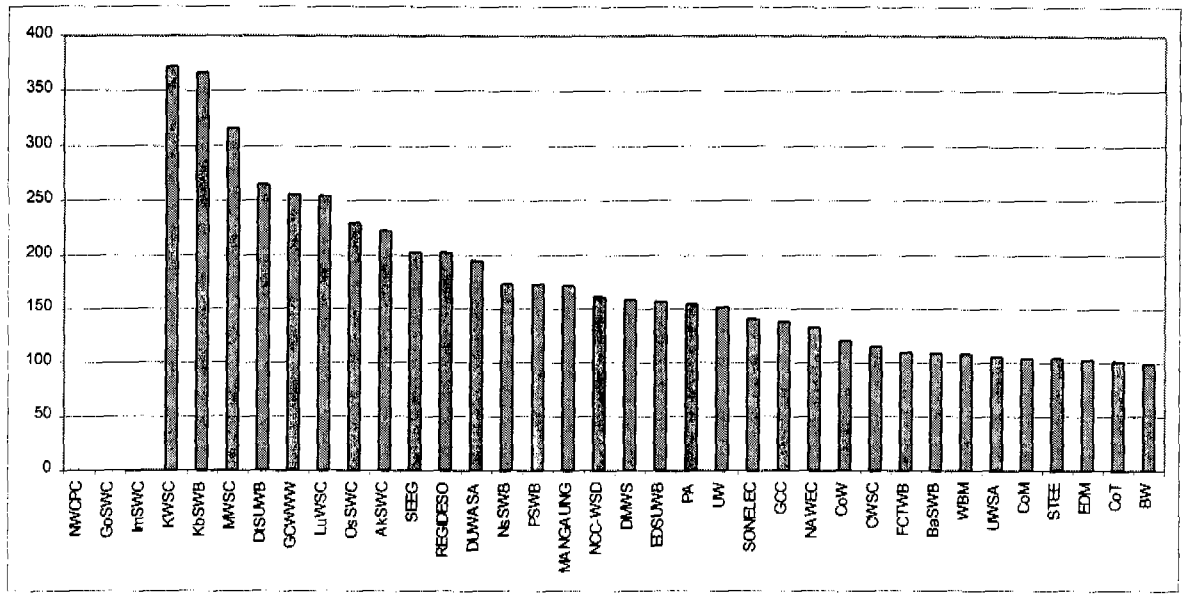
Units: litres per head per day (l/h/d)

This indicator represents the average daily consumption per person and should be reasonably comparable between utilities. Utilities should be aiming for a middle ground here – customers should have enough water available to support daily needs but demand should not be so high as to be wasteful, damage the environment or be unsustainable in the longer term. This indicator should be viewed alongside indicators 78W, 79W and 80W, which are all related to water demand and sustainability of resources. In addition, water usage levels clearly impact on wastewater service levels, so that control of customer demand can reduce operational and capital pressures on wastewater services. The per capita consumption measure is particularly useful when viewed over a number of years so that trends in customer use can be tracked at each utility.

Excessive per capita consumption can lead to resource constraints and capital demand for additional capacity. Conversely, these can be avoided by controlling per capita consumption.

For utilities where domestic customers are almost 100% metered, total domestic use can be calculated quite accurately. For the remainder of utilities where estimates have to be made, it can be quite difficult to determine the split between customer demand and unaccounted for water (or leakage). In the UK, where the majority of customers are not metered, the regulator is very keen to see the statistical and engineering justification behind high per capita consumption figures since there is a danger that companies over-report this figure and under-report the leakage figure.

In the UK, the average per capita consumption is around 150 litres per head per day (l/h/d), with individual companies reporting in the range 130 to 170. It could therefore be reasoned that a figure of over 200 l/h/d represents excessive usage. There are 13 utilities in this bracket on the graph, but 3 of these have figures of over 800 l/h/d and have been omitted as having likely data accuracy problems. At the other end of the scale, 13 utilities report a figure of less than 10 l/h/d (excluding those utilities reporting zero values), which may also point to likely data accuracy problems.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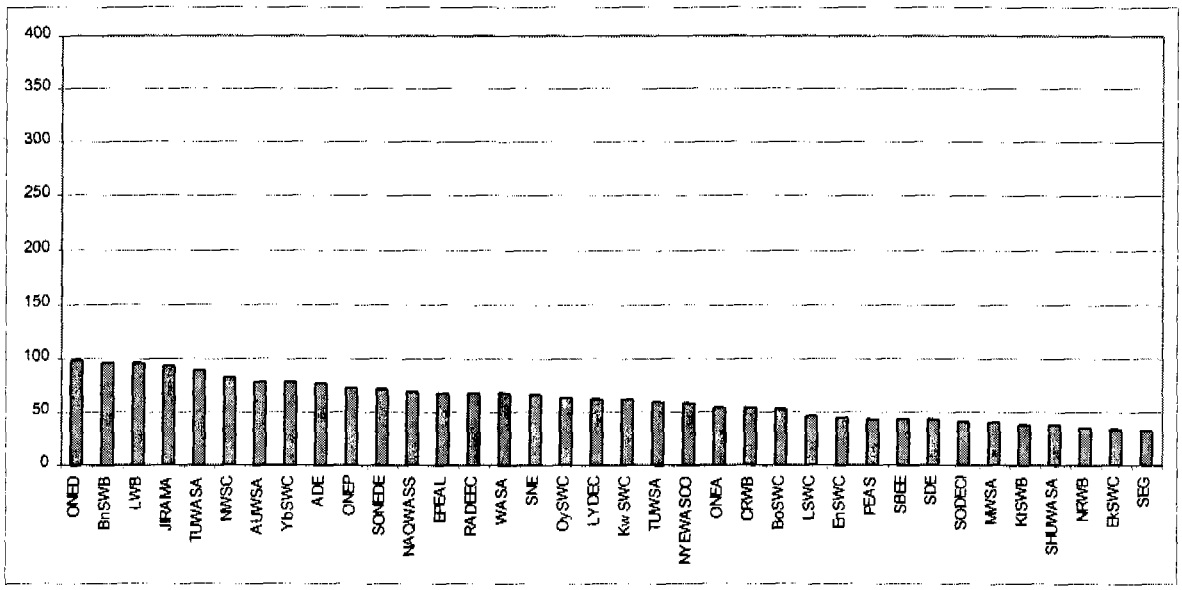
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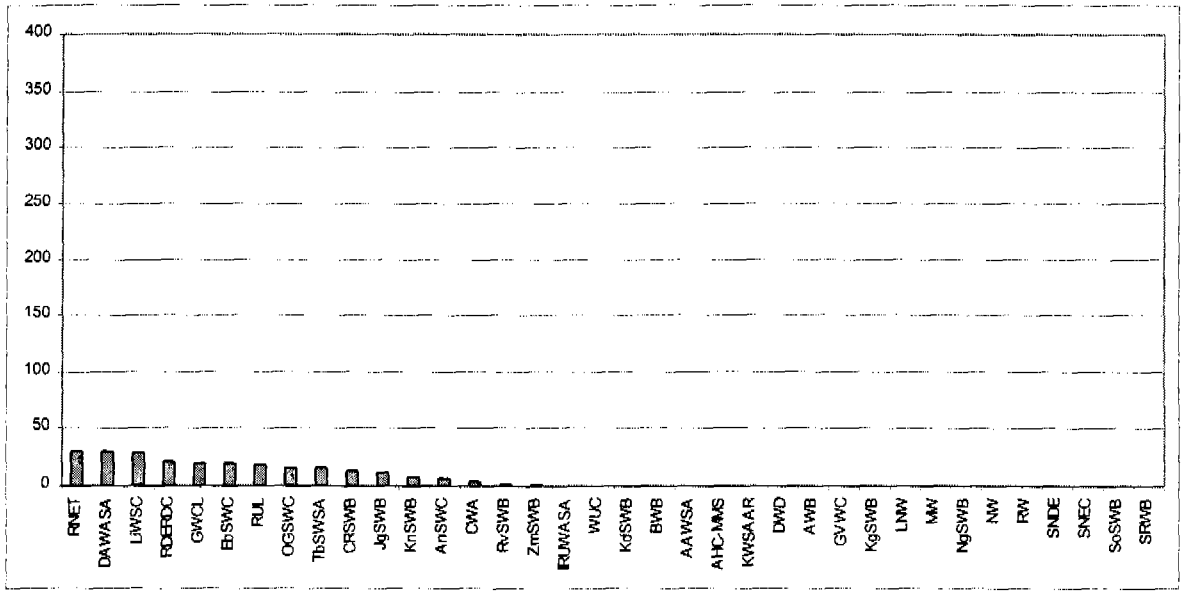
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3.7 78W: Water conservation programme

Included in the water-only questionnaire (Y/N)?	**Y**

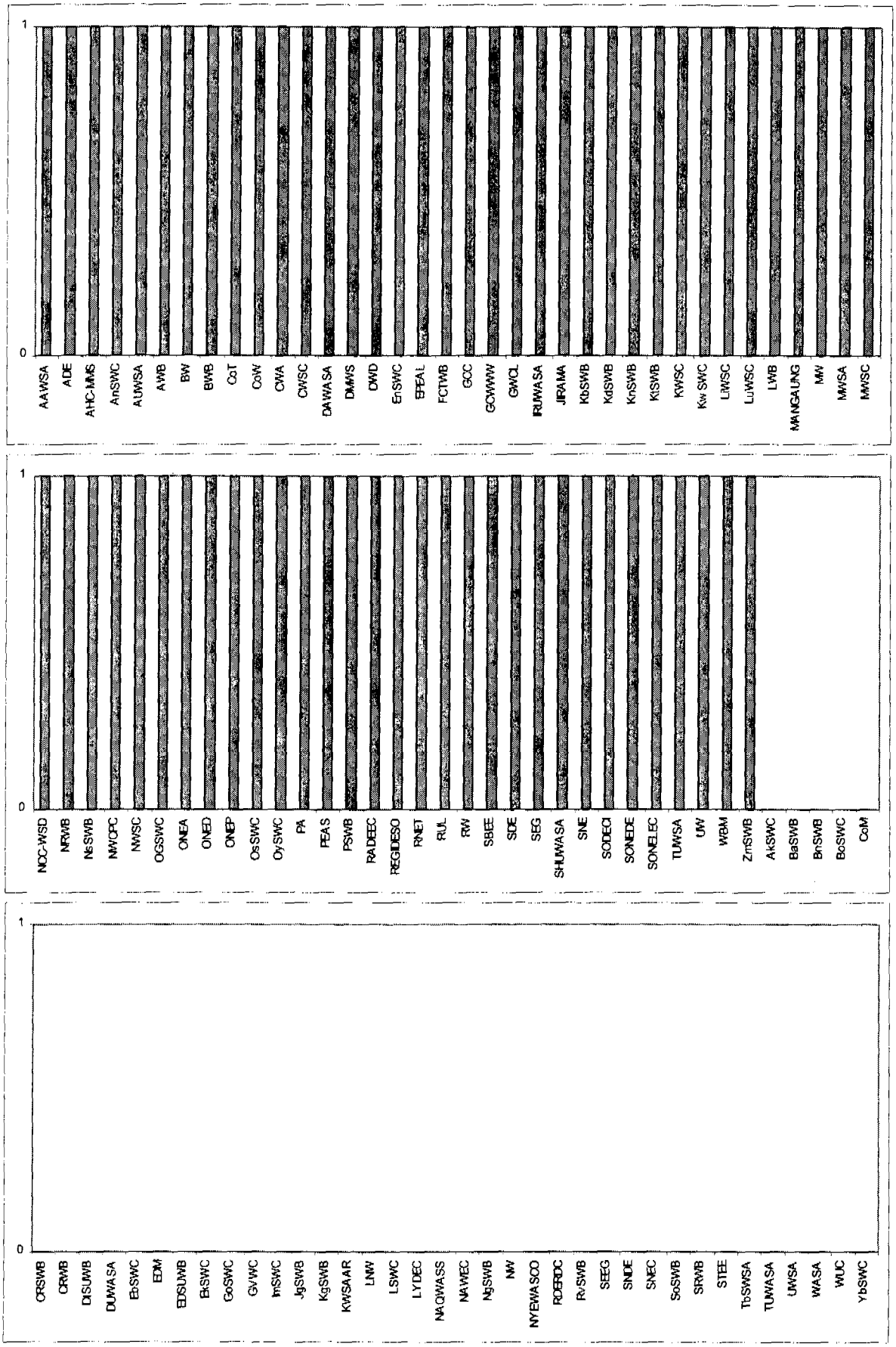
The indicator is simply a Yes/No indicator.

This indicator shows whether or not a utility has a water conservation or water use reduction programme or policy. It is prudent for all utilities, especially those with high customer demand or water resource constraints, to guard against excessive usage. Implementation of effective water conservation or water use reduction plans can lead to significant benefits. These plans are most effective when customers can see that the utility is also conserving water, for example, through leakage reduction programmes. This indicator should be viewed alongside indicators 77W, 79W and 80W, which are all related to water demand and sustainability of resources.

Clearly this indicator does not assess the extent or effectiveness of water conservation or water use reduction plans – such plans could vary greatly in quality between the utilities.

In the graph, 1 means "yes" and 0 means "no".

The graph shows that over 60% of utilities have a water conservation or water use reduction programme or policy. The remainder either do not have such a programme or have not responded to the question.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3.8 79W: Sustainability of water usage levels

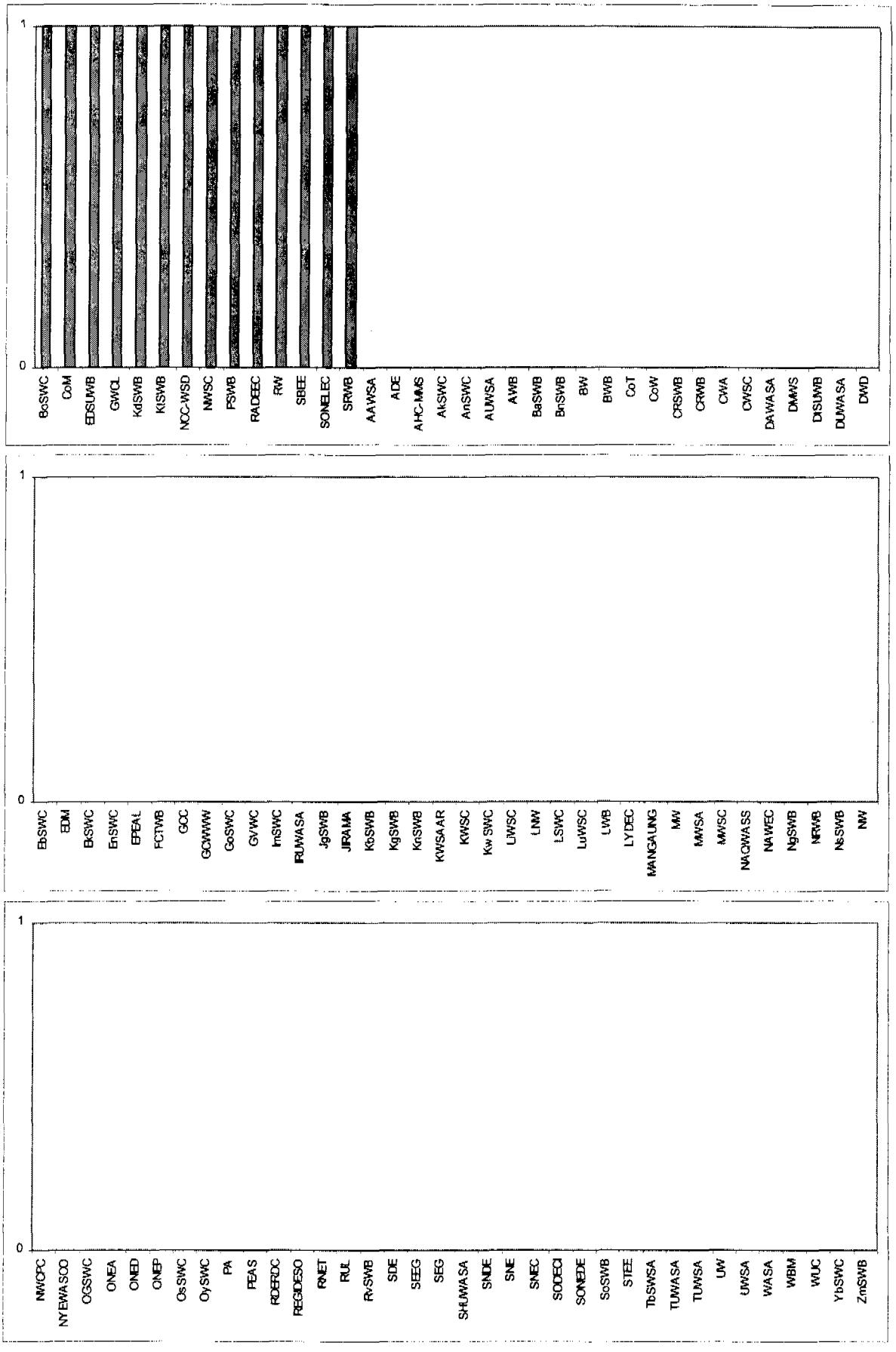
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator shows whether or not a utility believes that current water usage levels are sustainable into the future. This assessment may be based upon internal or external formal assessments of resource availability and conservation, or may be the utility's own view as to whether water can continue to be abstracted at the present rate without depleting resources. This indicator should be viewed alongside indicators 77W, 78W and 80W, which are all related to water demand and sustainability of resources.

In the graph, 1 means "yes" and 0 means "no".

14 utilities indicate that current water usage levels are sustainable into the future. However, this question was not included in the water-only questionnaire, so only the 29 utilities which entered water data on a full version of the questionnaire would have had the opportunity to respond to the question. The remaining 15 utilities either do not believe that current water usage levels are sustainable or have not responded to the question. This implies that only about half of utilities have sustainable water usage levels.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3.9 80W: Sufficiency of water resources

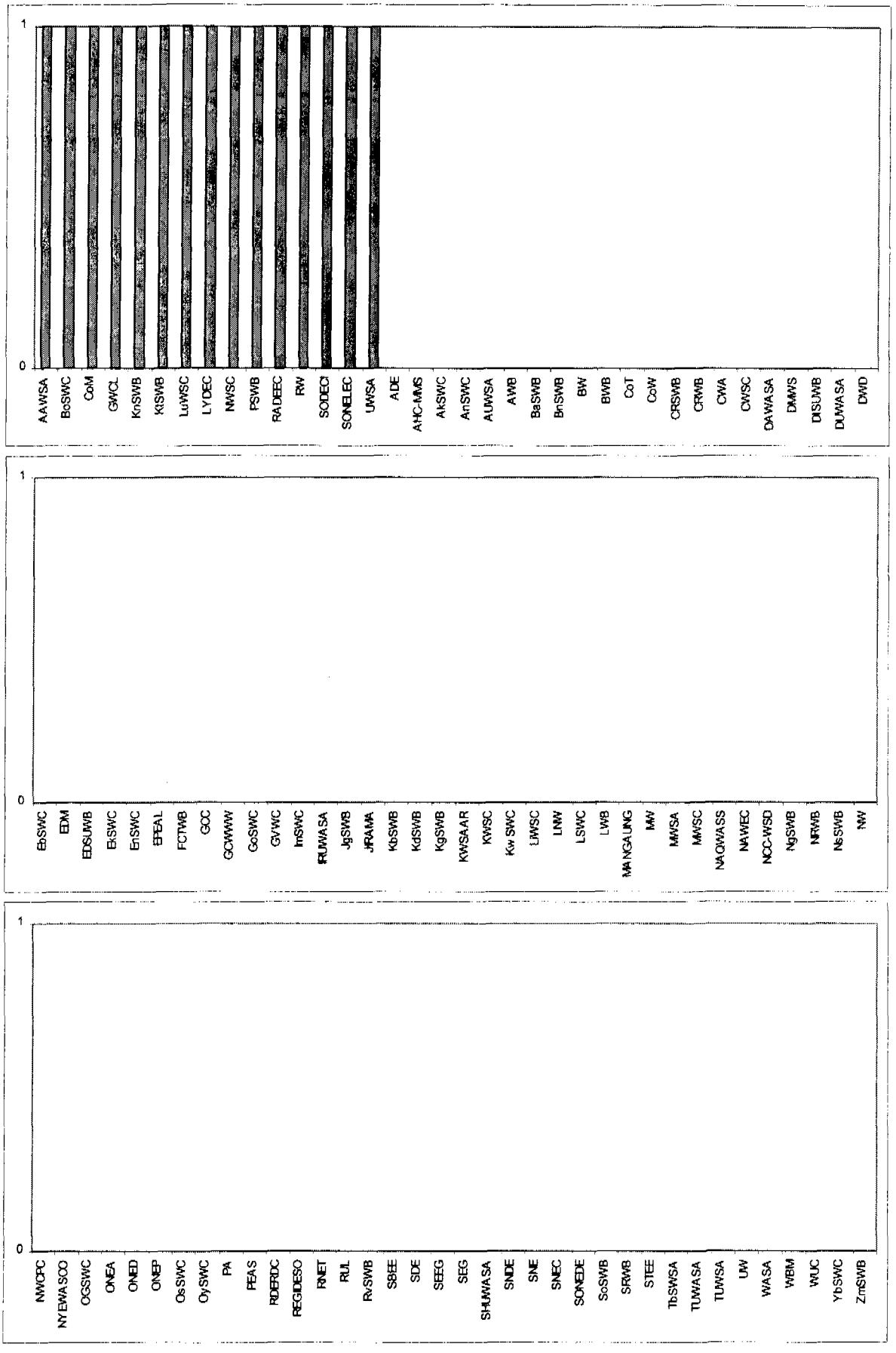
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator shows whether or not a utility believes that existing water resources are sufficient to meet future (10 years) demand. This assessment may be based upon internal or external formal assessments of resource availability and conservation, or may be the utility's own view as to whether existing water resources can meet demand 10 years into the future. This indicator should be viewed alongside indicators 77W, 78W and 79W, which are all related to water demand and sustainability of resources.

In the graph, 1 means "yes" and 0 means "no".

15 utilities indicate that existing water resources can meet demand 10 years into the future. The remaining 14 utilities to supply water data on a full questionnaire either have not responded to the question, or do not believe that their water resources are sustainable at current demand levels. This would indicate that only about half of utilities have water conservation programmes.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3.10 85W: Percentage treatment capacity utilised

Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

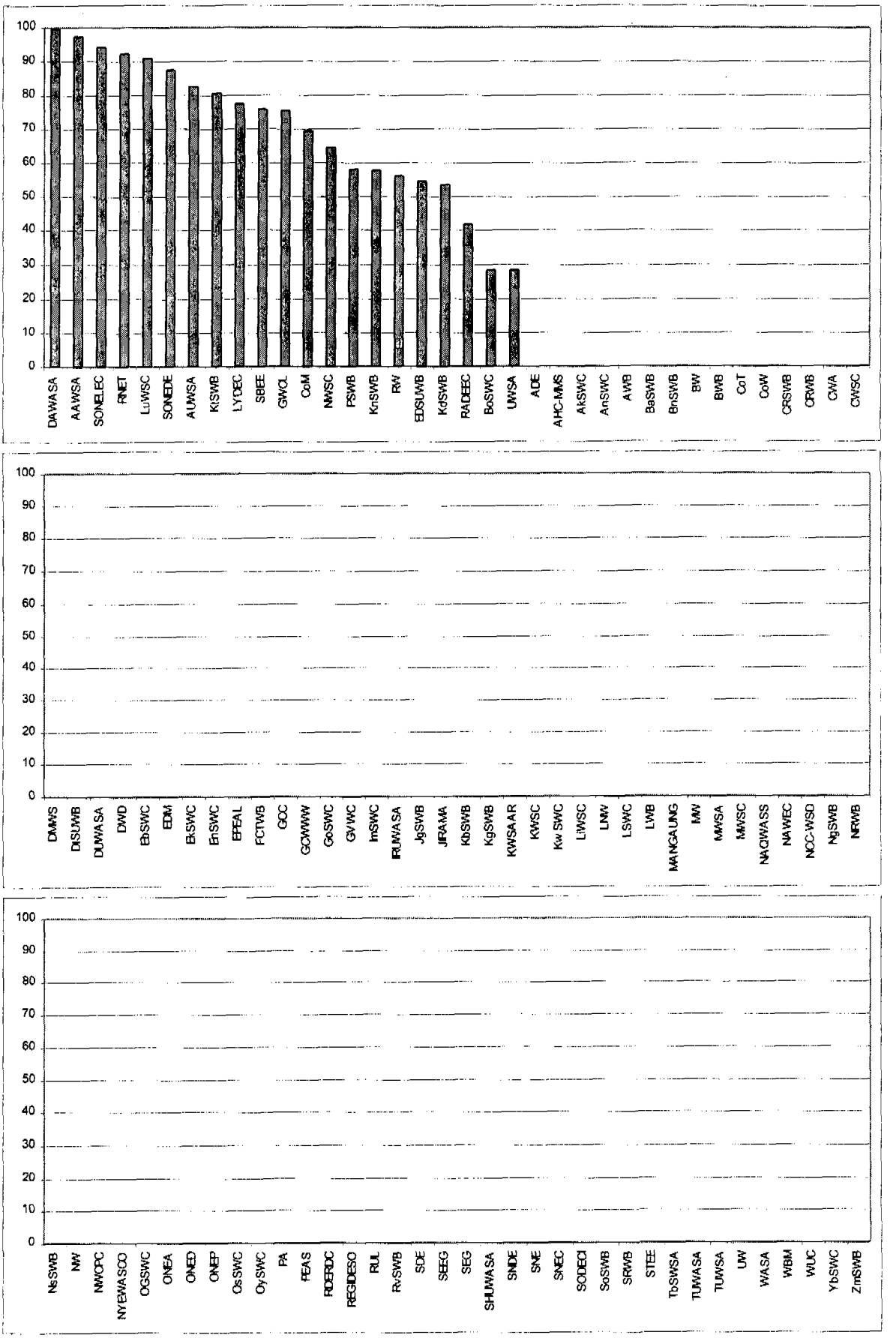
$$\frac{\text{Average daily volume of water treated (cu.m/day)}}{\text{Total design capacity of all treatment works (cu.m/day)}} * 100$$

This indicator is intended to identify the level of spare capacity within the system based on current demand, to identify those utilities where there are particular capacity constraints and where such constraints might be anticipated in the future based on demand growth pressures. Such constraints may focus efforts on levels of unaccounted for water and water conservation efforts (refer indicators 78W and 90W). This indicator should therefore be viewed alongside water conservation, water resources, demand and unaccounted for water indicators. Note that the measure is based on treatment capacity rather than network capacity, which would be more difficult to measure.

21 utilities provided data for this indicator – the remaining 8 utilities that supplied water data on a full questionnaire either reported zero or did not respond. Out of these 21, five utilities report that the percentage treatment capacity utilised is greater than 90%. This would indicate that the supply/demand balance is critical for these utilities and that water conservation, leakage reduction and treatment capacity extension are all measures which should be considered to address the potential shortfall.

In the UK, a "headroom" (buffer between capacity and demand) of between 5 and 10 percent is recommended, depending on the water resources position. Before companies are allowed to proceed with plans for capacity extensions, they must demonstrate that they have reduced leakage to economic levels and have implemented demand management measures such as metering, installing water saving devices and education programmes.

All five utilities with over 90% capacity utilisation have indicated that they have a water conservation or reduction programme. However, one of the utilities has high per capita consumption and high unaccounted for water. These issues need to be addressed before the utility seeks funding for capacity extension.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3.11 90W: Percentage unaccounted for water (UFW)

Included in the water-only questionnaire (Y/N)?	**Y**

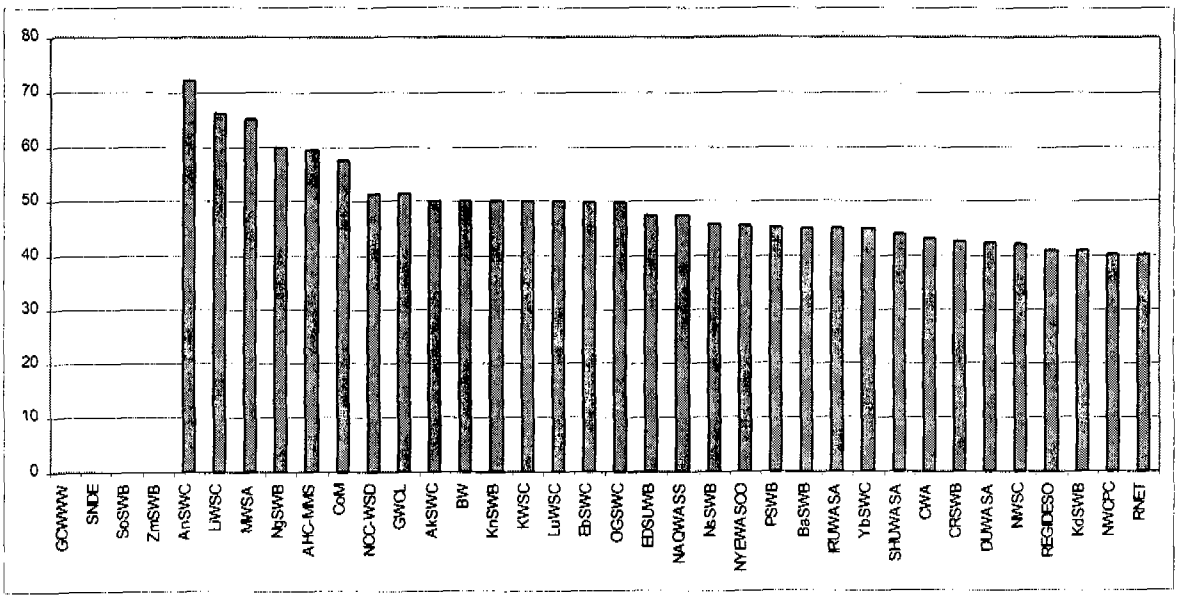
The indicator is calculated as:

$$\frac{\text{Volume of water distributed in year (cu.m)} - \text{Legitimate consumption in year (cu.m)}}{\text{Volume of water distributed in year (cu.m)}} * 100$$

This indicator is a measure of leakage and other system losses. Unaccounted for water (UFW) is taken to include leakage and theft, but also unmetered provision of public water such as fire hydrants, etc. The indicator is therefore a measure of the amount of water produced over and above the amount of water consumed and the principal difference is likely to be leakage/system losses. For every system there is an economic level of leakage, that is, an optimum level of leakage for that system. This is derived from a balance between resource availability and demand, and cost of water, offset by the progressive cost of leakage reduction, such that in every system there is a point of acceptable leakage. This indicator does not address economic levels of leakage, it merely compares the relative levels of unaccounted for water. This indicator should therefore be viewed alongside water conservation, water resources and demand indicators.

4 utilities reported an UFW of 100%, which is clearly a data entry error. These outliers are the utilities on the left hand side of the top graph. In addition, 9 utilities either reported a zero figure or did not provide data – these are the utilities on the right hand side of the bottom graph. Out of the remaining valid data, it can be seen that UFW figures vary greatly, from 3% to over 70%. It is difficult to recommend a target value for UFW – as described above, each utility will have its own optimum value, dependent upon the water resources position, cost of water, cost of leakage control and system characteristics such as density of connections and age of infrastructure. It is interesting to note that the three utilities with the highest UFW all have water use reduction programmes. It may, therefore, be appropriate for these utilities to "practice what they preach" in terms of conserving water.

In the UK, almost all utilities lie in the range 10 to 20 percent UFW. Utilities in the drier South-east region of England are mostly nearer the 10% mark whereas utilities in the wetter Western and Northern areas are mostly near the 20% mark.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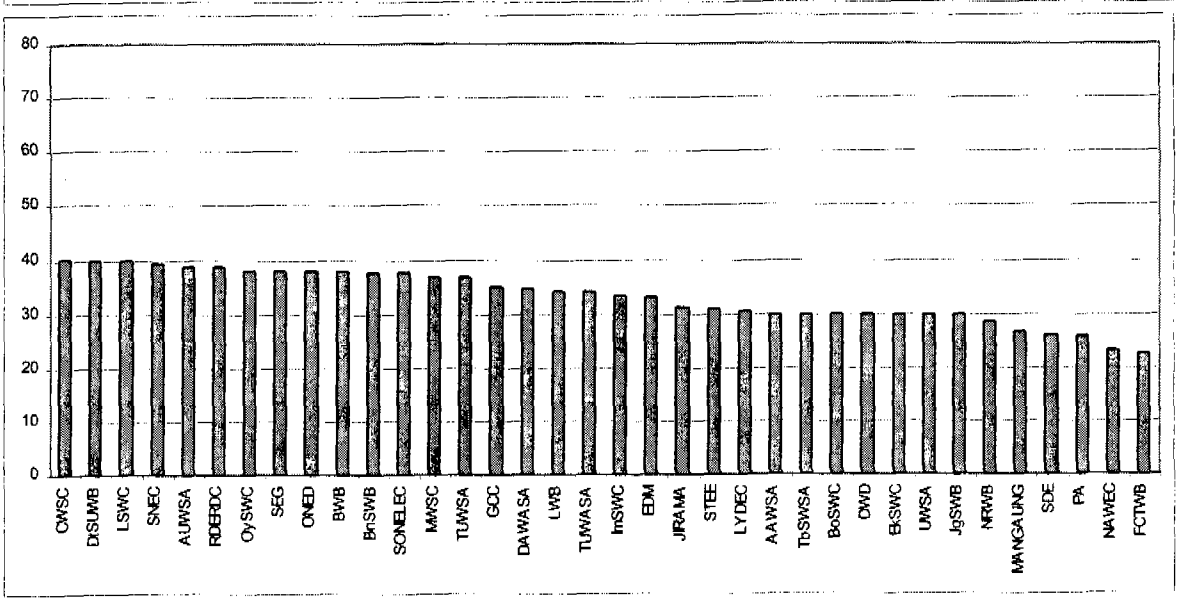
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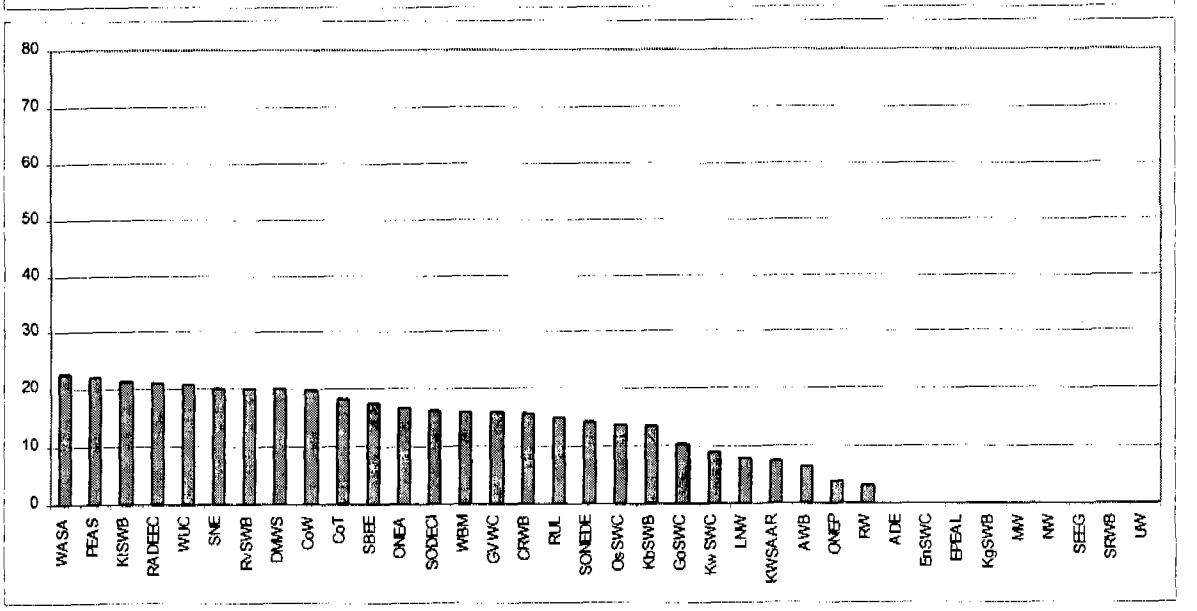
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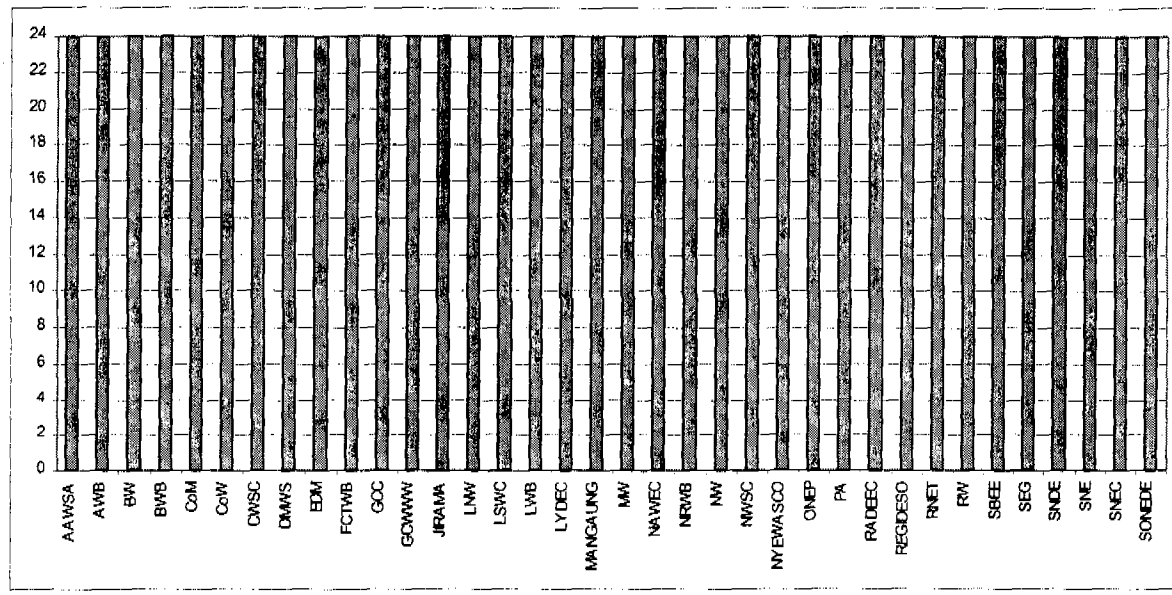
3.12 92W: Availability of piped water supply (hours per day)

Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is input directly by the user.

This indicator is a measure of the availability of water supply. It is measured in terms of the average number of hours each day when a normal supply is provided. The average is calculated over all water users and over the whole year. This is important since the availability of water supply may vary greatly from one area to another and from one season to another.

Some 40 utilities report that piped water supply is available 24 hours a day on average. This is clearly the benchmark for this measure. At the other end of the scale, 21 utilities report a value of less than 12 hours a day. 9 utilities did not report a value or reported a zero value. Clearly this indicator does not tell the whole story regarding availability of piped water supply. For example, two utilities could each report 12 hours, but the first may be maintaining this level all year round to all areas, whereas in the second, there may be some areas with 24 hour supply and some with next to nothing and there may also be significant seasonal variations.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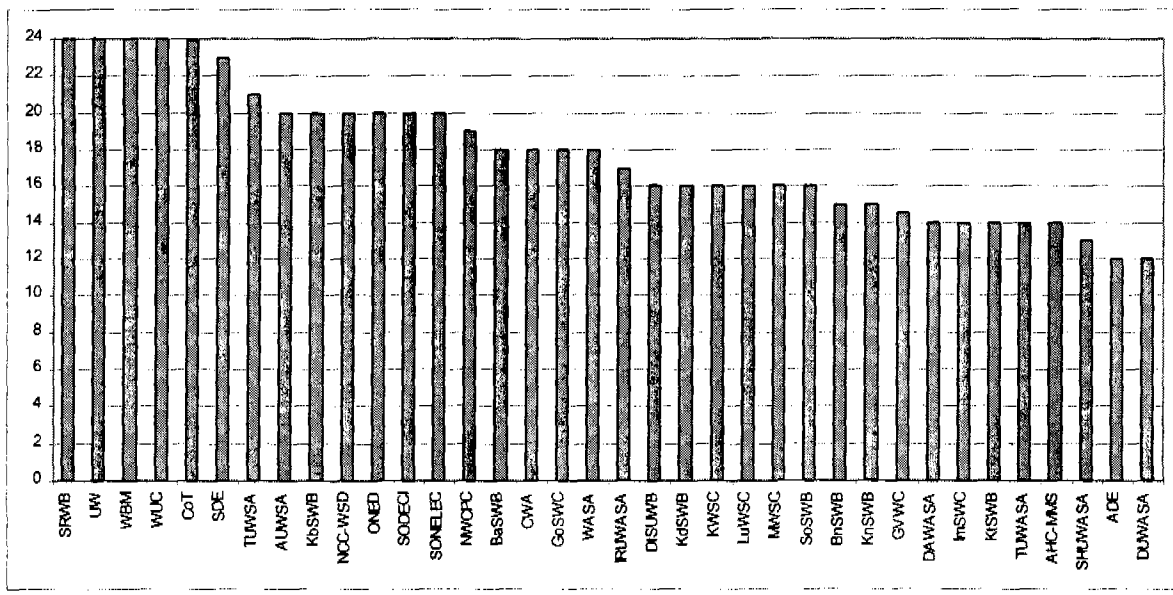
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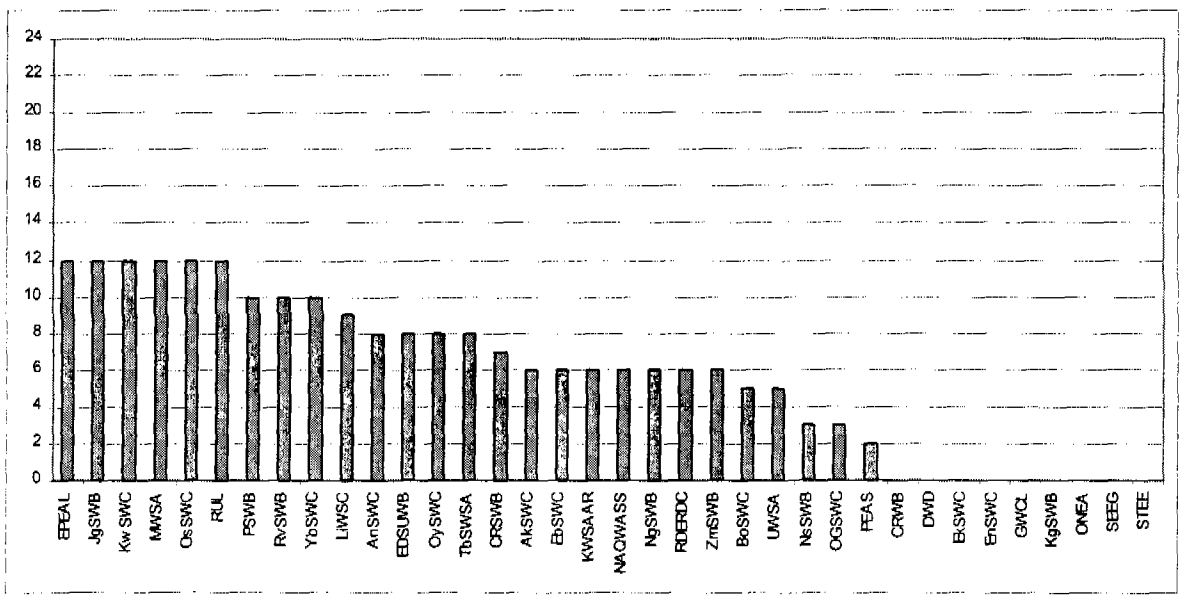
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NgSWB
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GWCL
KgSWB
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3.13 94W: Recording of interruptions to supply

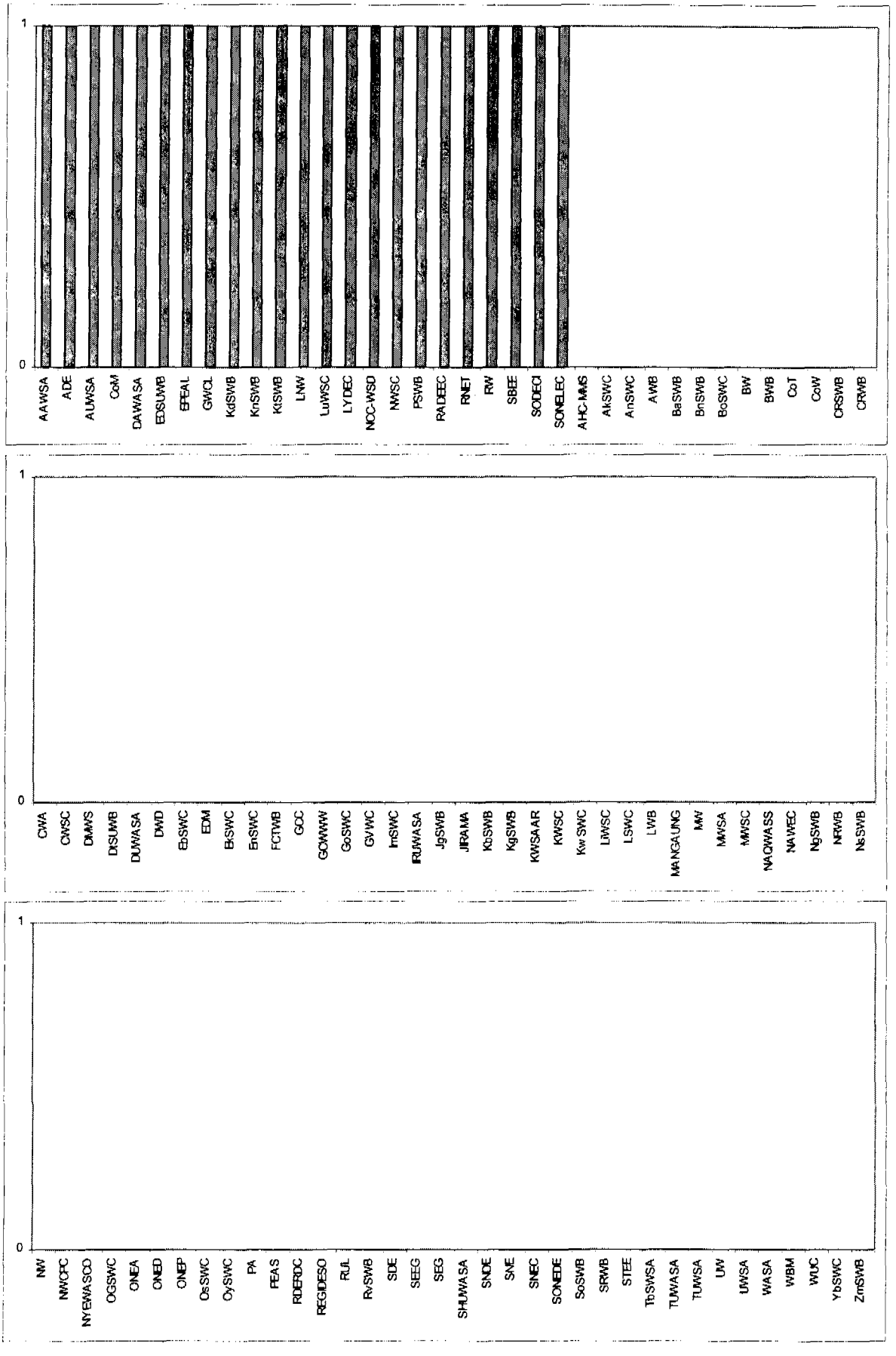
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities routinely record plant and infrastructure failures which affect customers. Clearly, utilities which record such failures are in a better position to effectively manage the assets in their control and have the information available to make decisions regarding any required remedial action.

In the graph, 1 means "yes" and 0 means "no".

23 utilities indicate that they routinely record plant and infrastructure failures which affect customers. The remaining 6 utilities that supplied full questionnaires have either indicated no or have not replied to the question.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3.14 98W: Routine monitoring of raw water quality

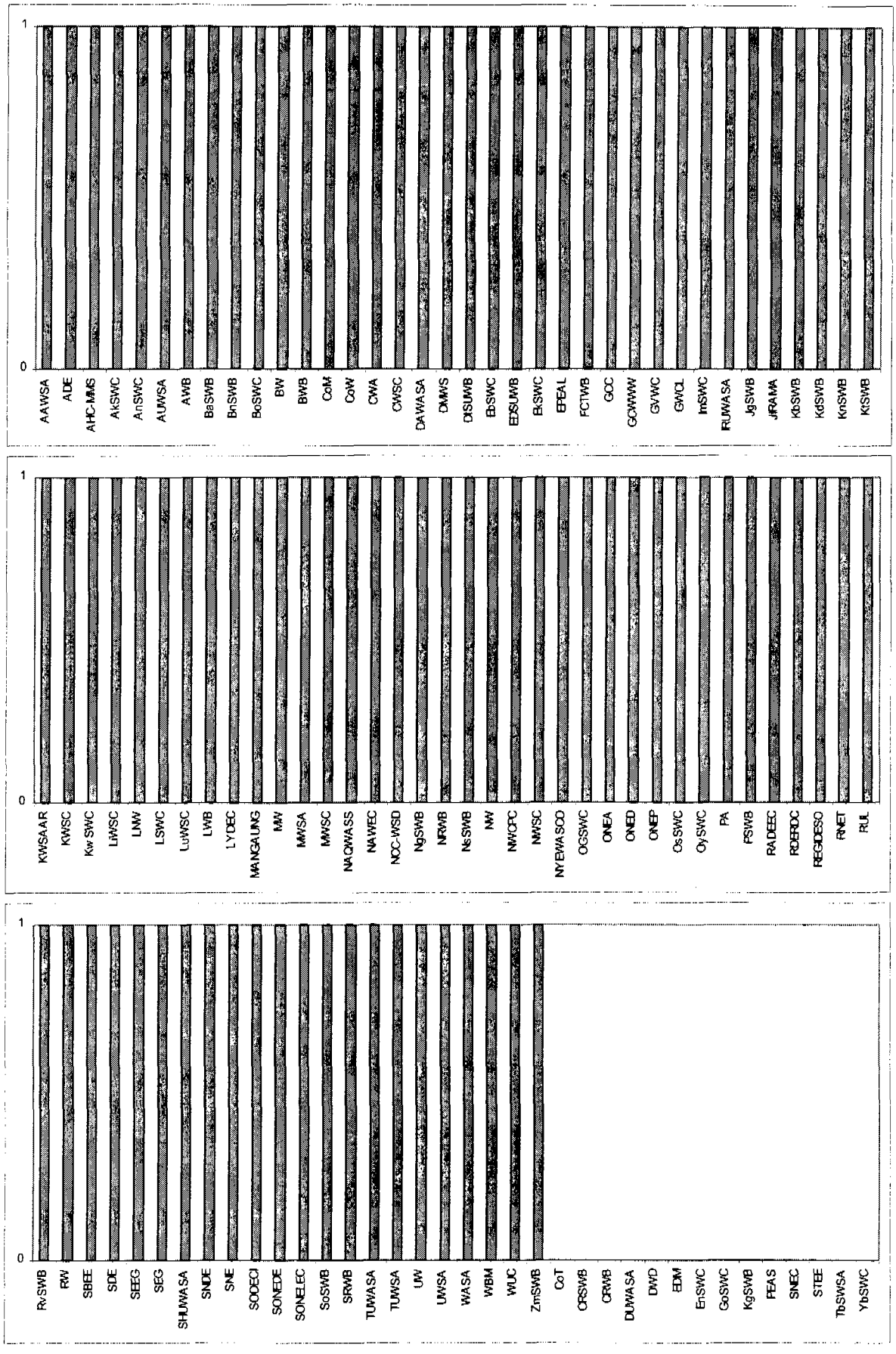
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities routinely monitor raw water quality at all or most main water sources. Clearly, utilities which routinely monitor raw water quality will have advanced warning of water quality problems and can prevent adverse public health incidents.

In the graph, 1 means "yes" and 0 means "no".

Almost 90% of utilities indicate that they do routinely monitor raw water quality at all or most main water sources. The remainder either do not monitor or have not responded to the question. The question is worded such that a positive response is merited even if a utility does not routinely monitor raw water quality at nearly half of its main sites. Therefore, care should be taken when interpreting this indicator.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3.15 99W: Routine monitoring of water quality in distribution

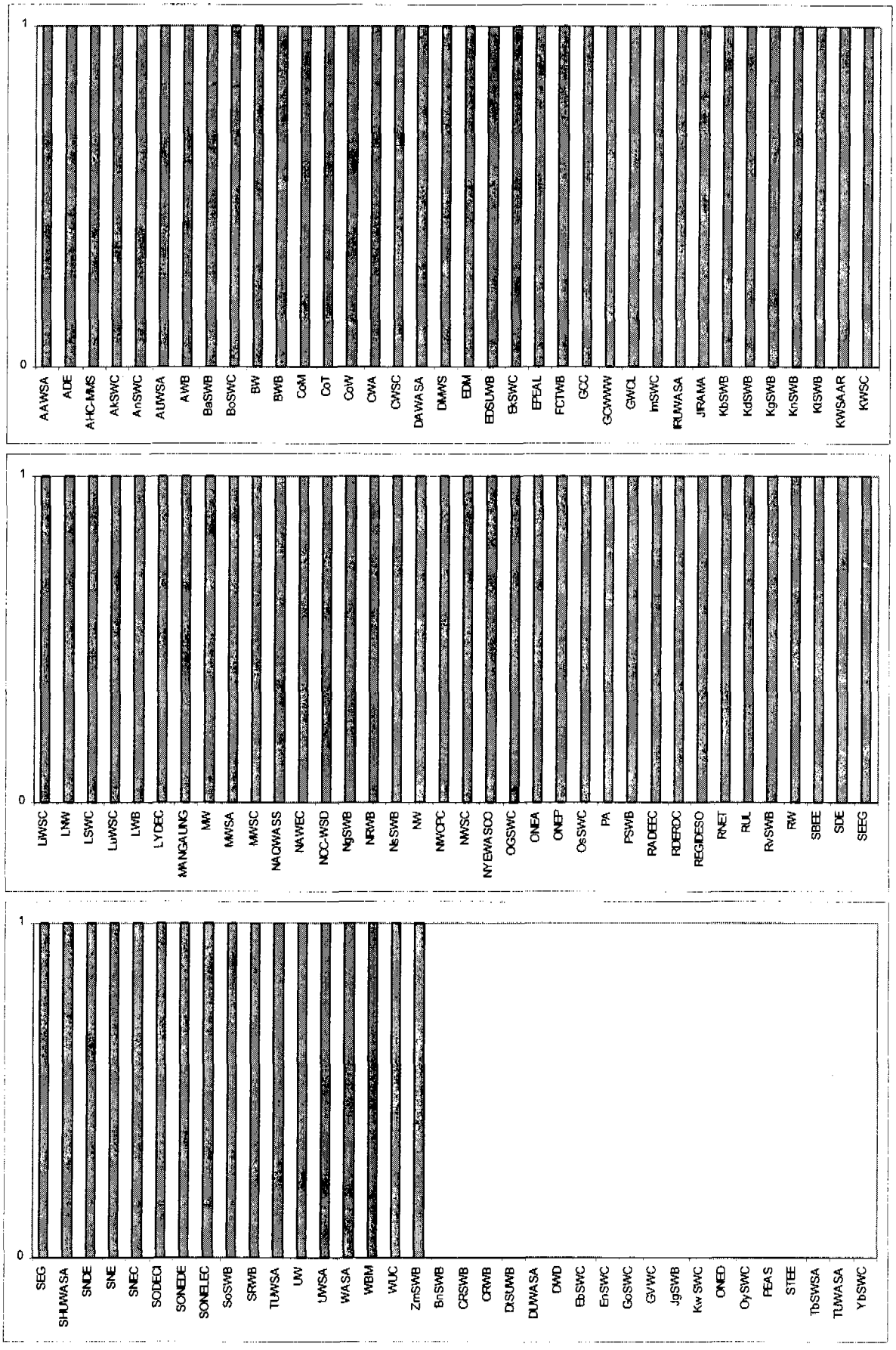
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities routinely monitor water quality at various places in the distribution system. Clearly, utilities which routinely monitor water quality in distribution will be able to detect whether water is up to the required quality to supply to its customers and is not reliant on customer feedback which may be too late to prevent widespread contamination.

In the graph, 1 means "yes" and 0 means "no".

Over 80% of utilities indicate that they do routinely monitor water quality at various places in the distribution system. The remainder either do not monitor water quality in distribution or have not responded to the question.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3.16 100W: Percentage samples failing to meet quality standards

Included in the water-only questionnaire (Y/N)?	**Y**

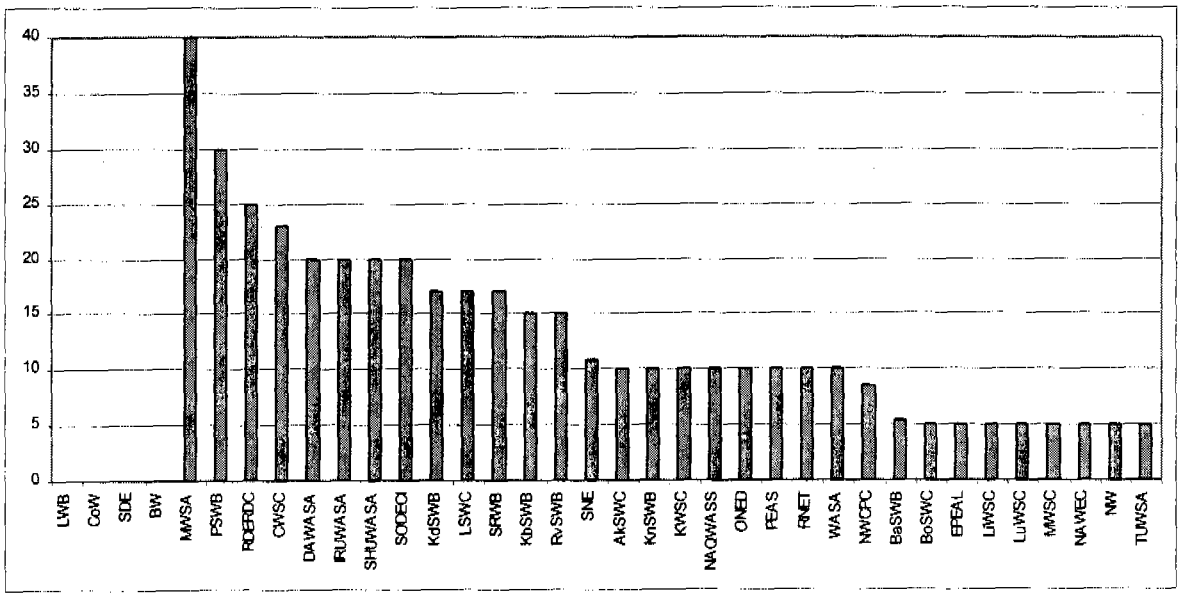
The indicator is input directly by the user.

This indicator is a measure of the quality of water delivered to customers. It is defined as the percentage of samples taken and tested that failed to meet current quality standards. The applicable standards are current local standards, which may vary between utilities.

The 4 utilities on the left side of the top graph are considered outliers since they all reported figures of 95% or greater. Whilst this is feasible, it is perhaps unlikely since the next highest value is 40%. All of the utilities from AAWSA on the middle graph to the end of the bottom graph either report a zero figure or have not responded to the question.

It is difficult to recommend a benchmark for this indicator since the target should be 0%, although this may not be achievable in practice. There are also issues which cloud the picture such as varying local standards and the fact that a failure on one parameter (such as faecal coliforms) may be more serious than 100 failures on another parameter (such as colour or taste). In the UK, values range from virtually zero to 0.6%.

For all indicators, it is important to track performance over time for each utility, but it is particularly important for this indicator. Improving water quality levels should be the aim of all utilities that have not yet achieved perfection and, where investments have been made to improve quality, the effectiveness of these investments can be measured.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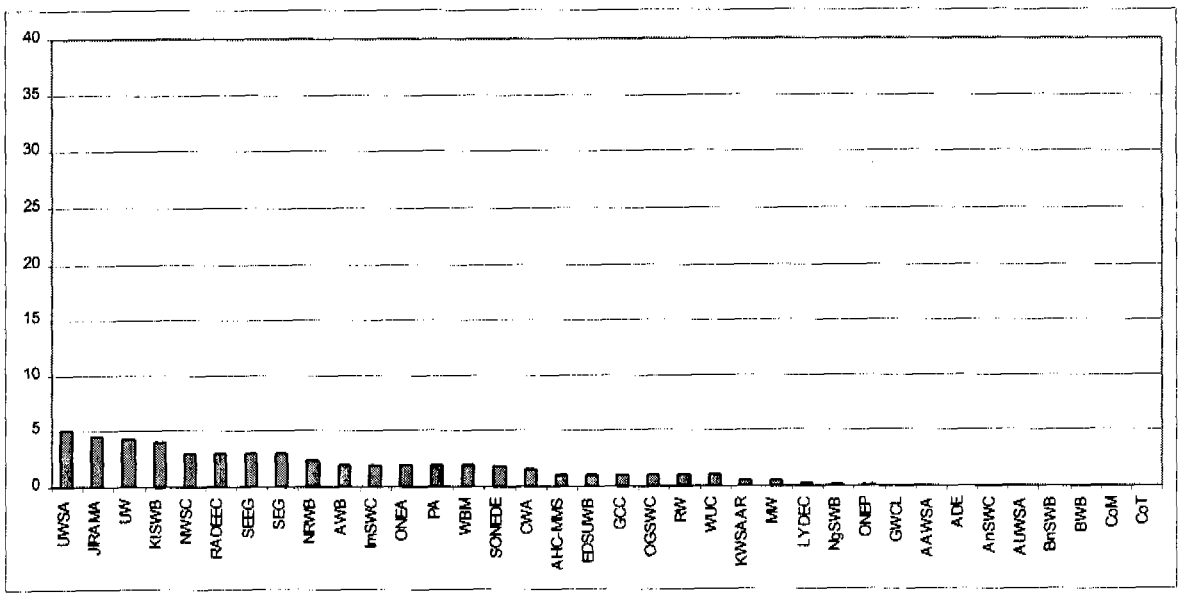
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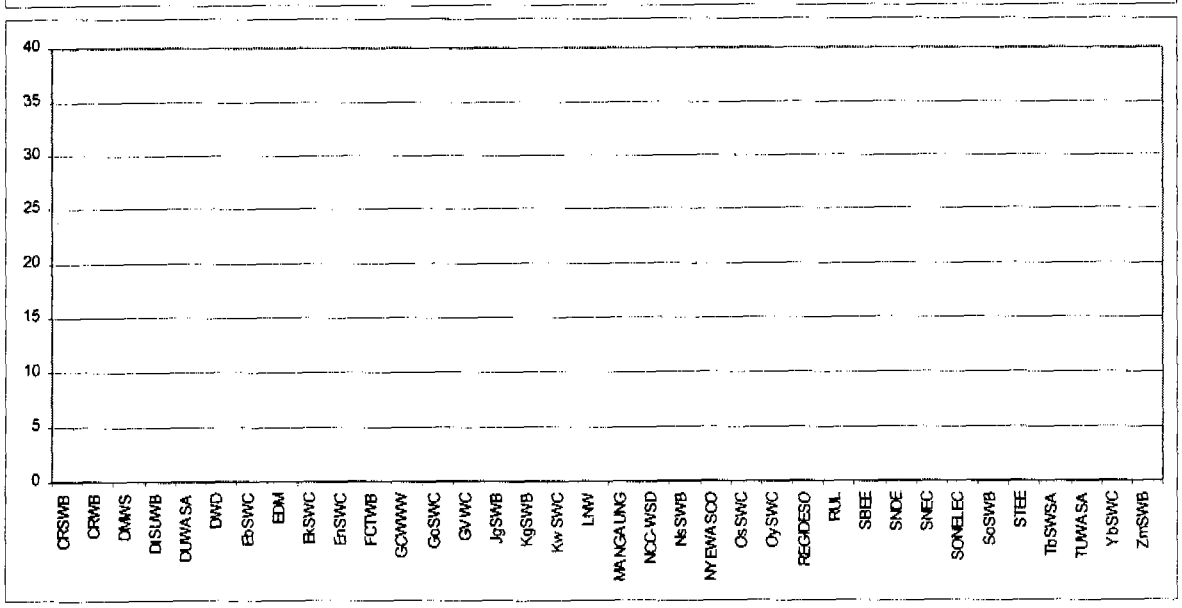
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3.17 101W: Public health education

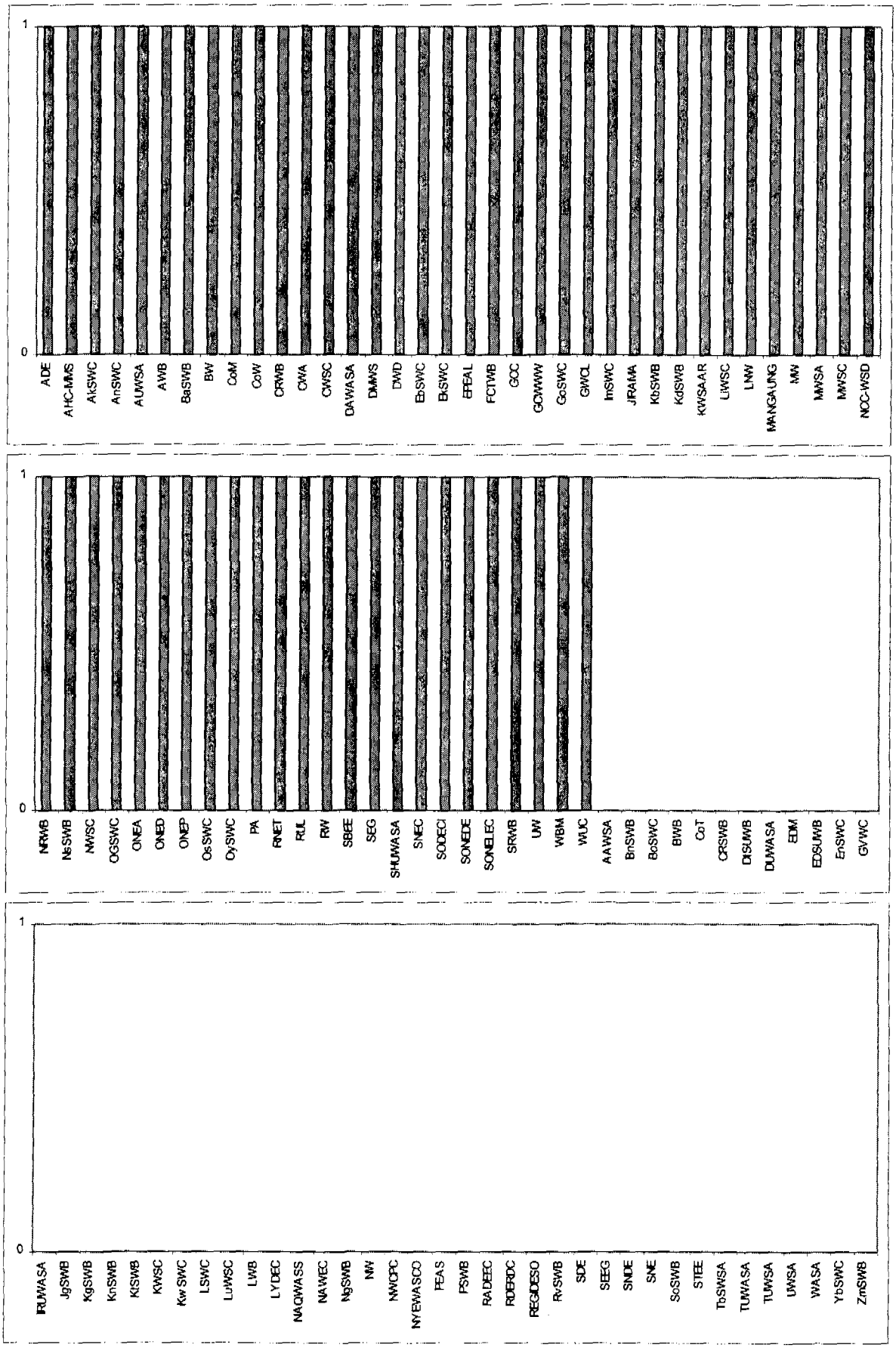
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities actively promote public health education. It is important that the public are aware of the dangers of waterborne diseases and know how to minimise the risk of contracting these diseases. Activities such as boiling water and covering stored water, where appropriate, are particularly important.

In the graph, 1 means "yes" and 0 means "no".

Over half of utilities indicate that they do actively promote public health education. The remainder either responded negatively or did not respond.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3.18 124W: Percentage planned and unplanned maintenance

Included in the water-only questionnaire (Y/N)?	**N**

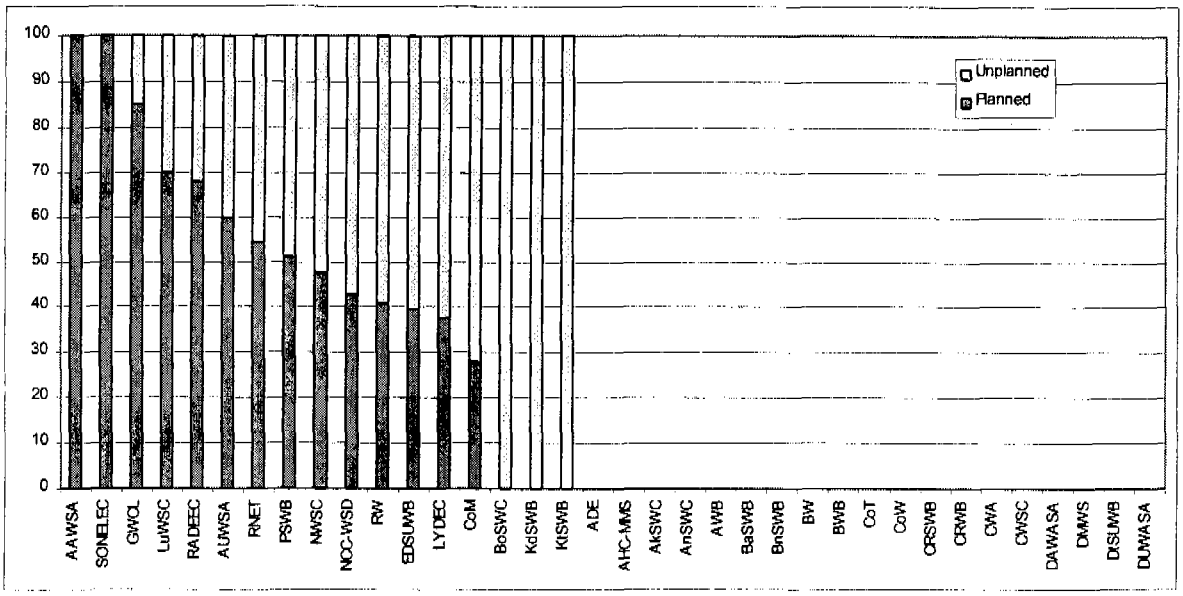
The indicator is calculated as the percentage split between planned and unplanned maintenance, based on the planned and unplanned maintenance costs reported for the year.

Planned maintenance cost is defined as all costs associated with maintenance programmes and normal maintenance routines, basically all scheduled maintenance. Unplanned maintenance cost is defined as all maintenance expenditure associated with emergency repairs, breakdowns and all non-planned maintenance.

This indicator is a measure of the degree to which the utilities' assets are being pro-actively managed. It is a leading indicator of the level of service to customers, i.e. poor performance in this indicator means that, if sustained over a period of time, assets will deteriorate leading to reduced service levels to customers.

17 utilities supplied data for the indicator. The remaining 12 utilities that submitted a full questionnaire did not respond to this question. Responses range from two utilities with 100% planned maintenance to three utilities with 100% unplanned maintenance, with a spread of values in between these two extremes. It is difficult to imagine that a utility has 100% planned maintenance since this implies that nothing has broken down during the year. It is for each utility to determine its own optimal level of maintenance (similar to the economic level of leakage) since too little maintenance leads to deteriorating asset condition and service levels whilst too much maintenance is clearly prohibitively expensive. This optimum level will be determined by various factors including asset stock, age and condition of assets, cost of maintenance and environmental factors such as climate.

This indicator should be viewed alongside other maintenance information, such as 128W, since a utility may report a high percentage planned maintenance but the overall level of maintenance undertaken may be relatively low.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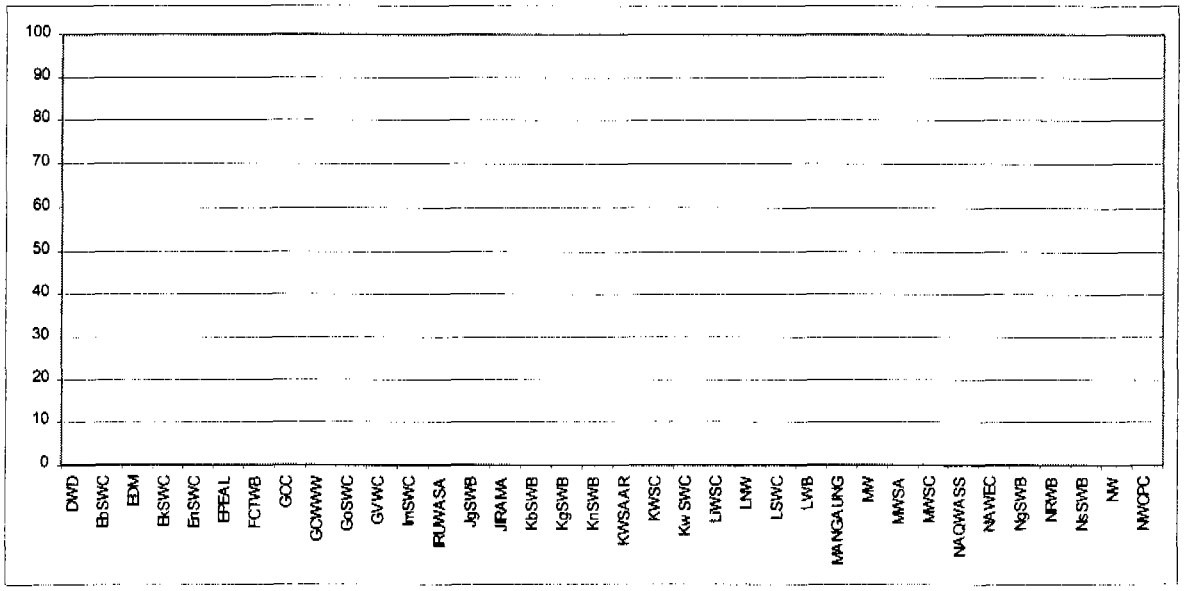
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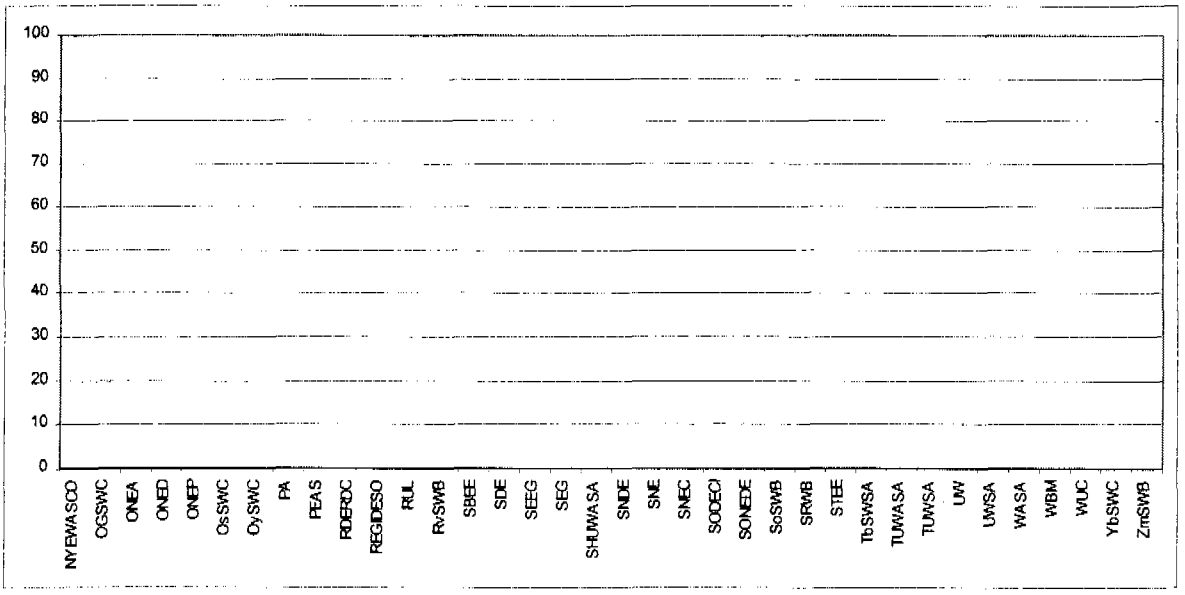
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3.19 128W: Maintenance costs as a % of total operating costs

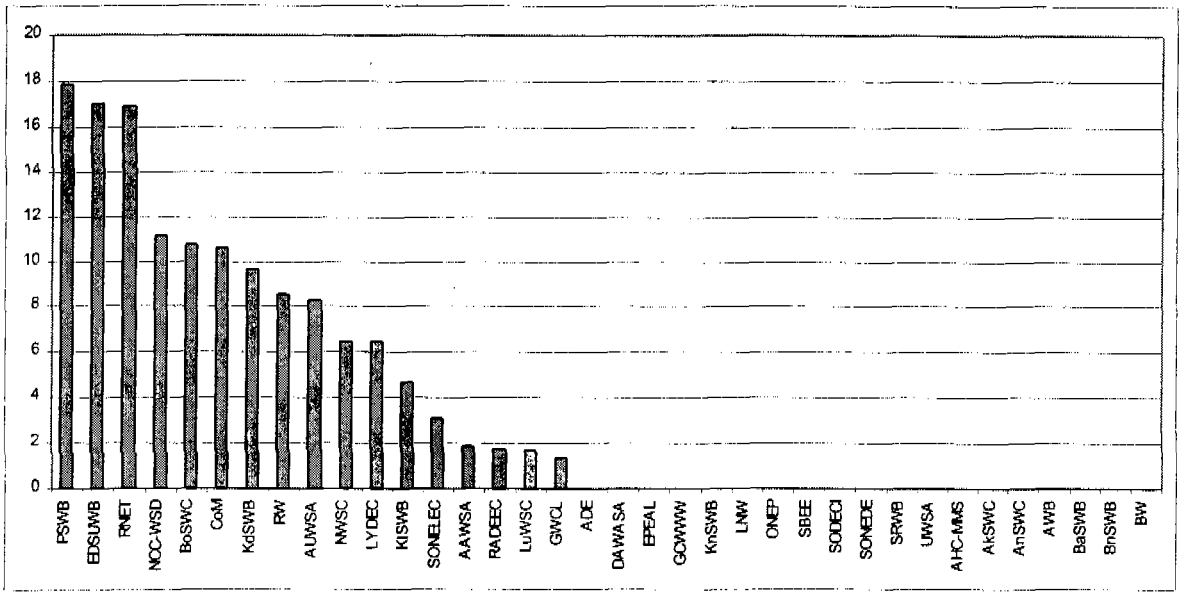
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{Total maintenance costs}}{\text{Total operating and maintenance costs}} * 100$$

This indicator is a measure of the relative level of maintenance costs in comparison with total operating costs. A high percentage is likely to indicate a high level of maintenance but it is possible that the reason could also be a relatively low denominator (total operating and maintenance costs). This indicator should therefore be viewed alongside 124W and operating cost data available from the database.

17 of the 29 utilities to submit a full questionnaire provided data for this indicator. Values range from 1% to 18%. As described in 124W, the optimum level of maintenance depends on many factors, mostly specific to each utility, and cannot be determined as an absolute value.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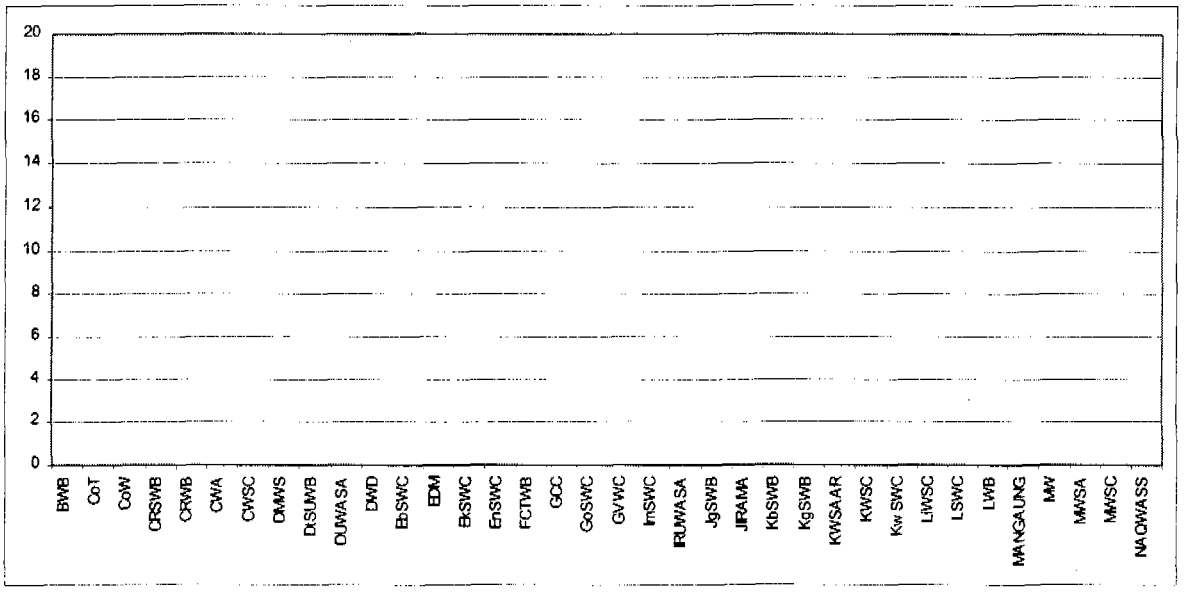
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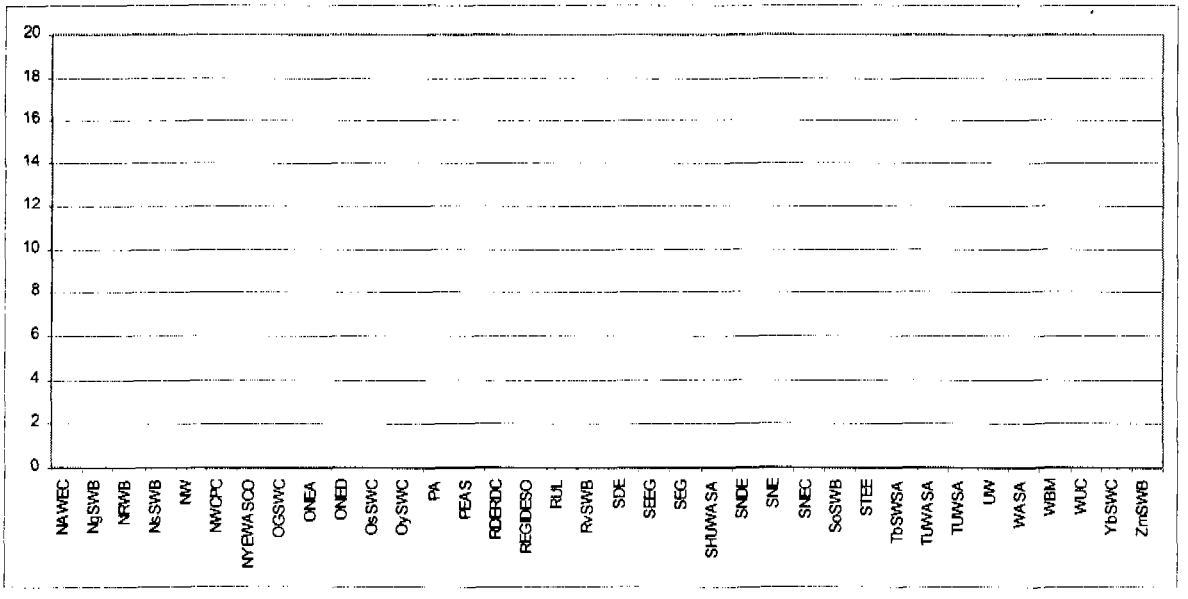
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3.20 130W: Recording of customer complaints

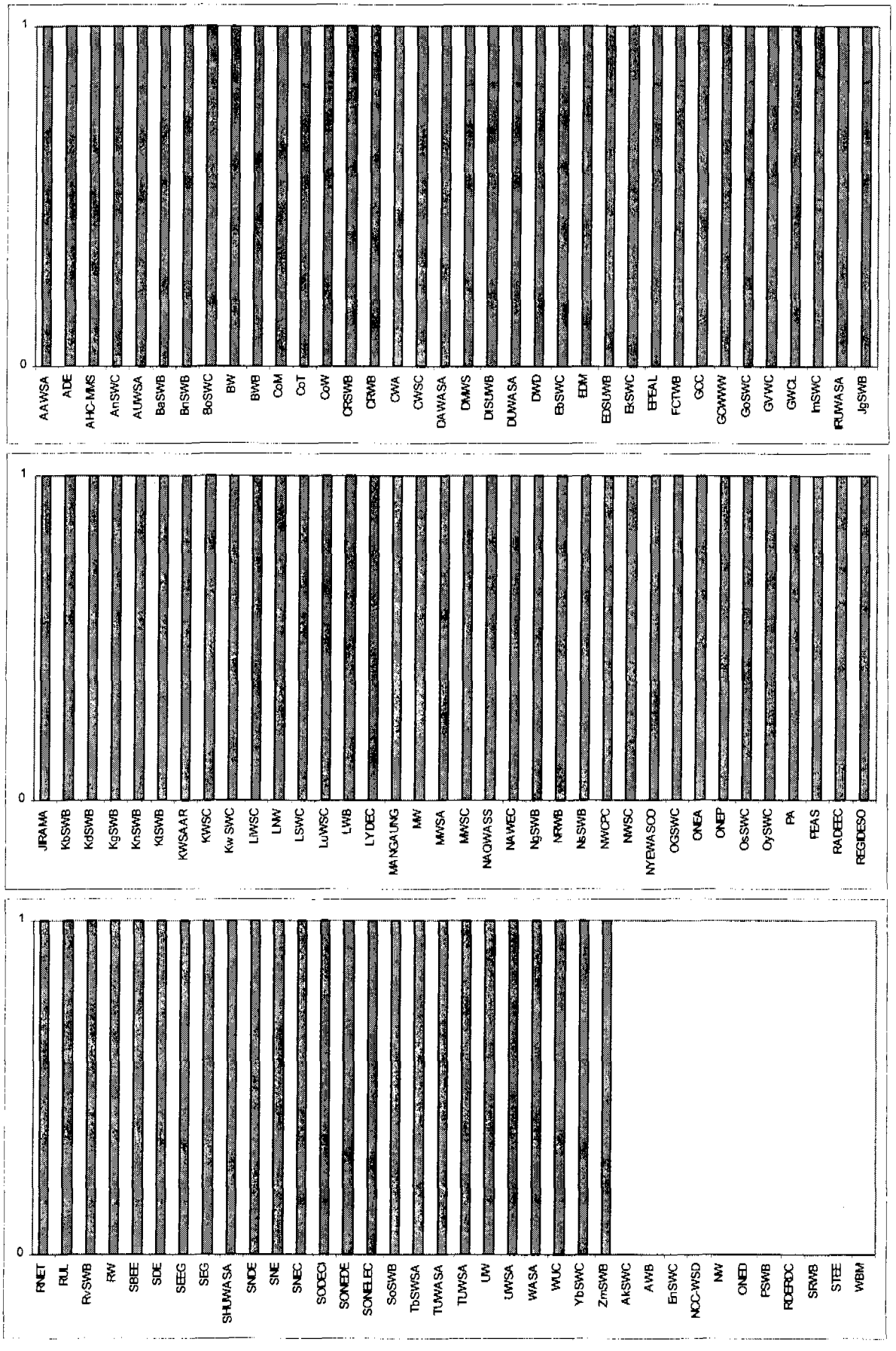
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities routinely maintain a record of customer complaints received. A utility which maintains such a record is able to respond to customer needs and can demonstrate that it takes customer service seriously. This indicator should be viewed alongside other customer services indicators and information available on the database.

In the graph, 1 means "yes" and 0 means "no".

90% of utilities indicate that they do routinely maintain a record of customer complaints received. The remainder either responded negatively or did not respond. Clearly the indicator does not provide any information about the extent or depth of the information recorded nor any actions resulting from the complaint.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3.21 136W: Customer surveys

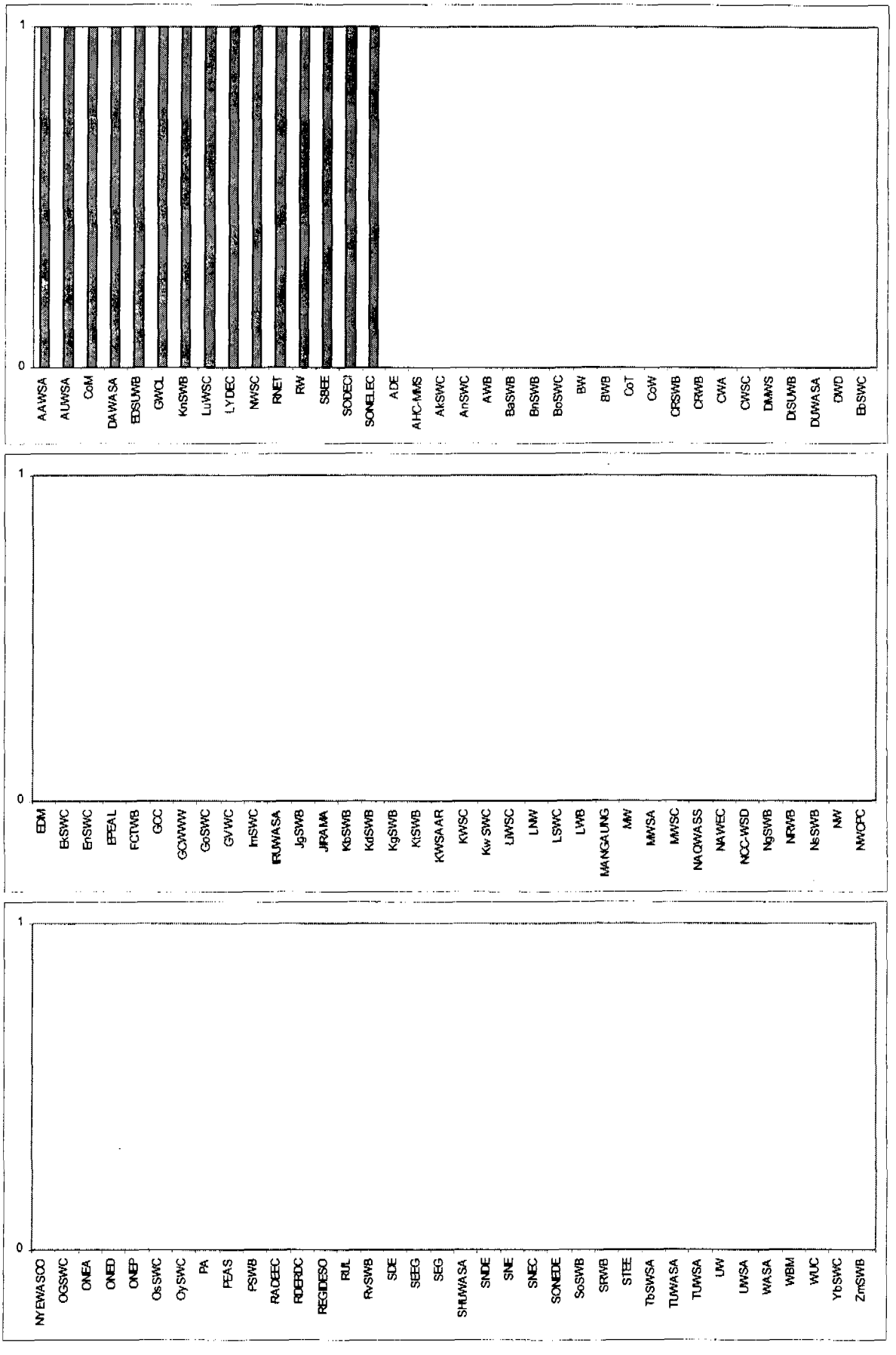
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities conduct customer surveys to identify customer needs and demands. A utility which undertakes such surveys can demonstrate that it takes seriously the views and requirements of its customers. It is also a good way to canvass opinion about particular issues and can form part of evidence to regulators to help justify improvement investment. This indicator should be viewed alongside other customer services indicators and information available on the database.

In the graph, 1 means "yes" and 0 means "no".

15 of the 29 utilities to submit a full questionnaire indicate that they do conduct customer surveys to identify customer needs and demands. The remainder either responded negatively or did not respond. The indicator does not provide any information about the content or scope of the customer surveys nor any information about how the surveys are used in decision making.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3.22 147W: Staff per 1000 connections

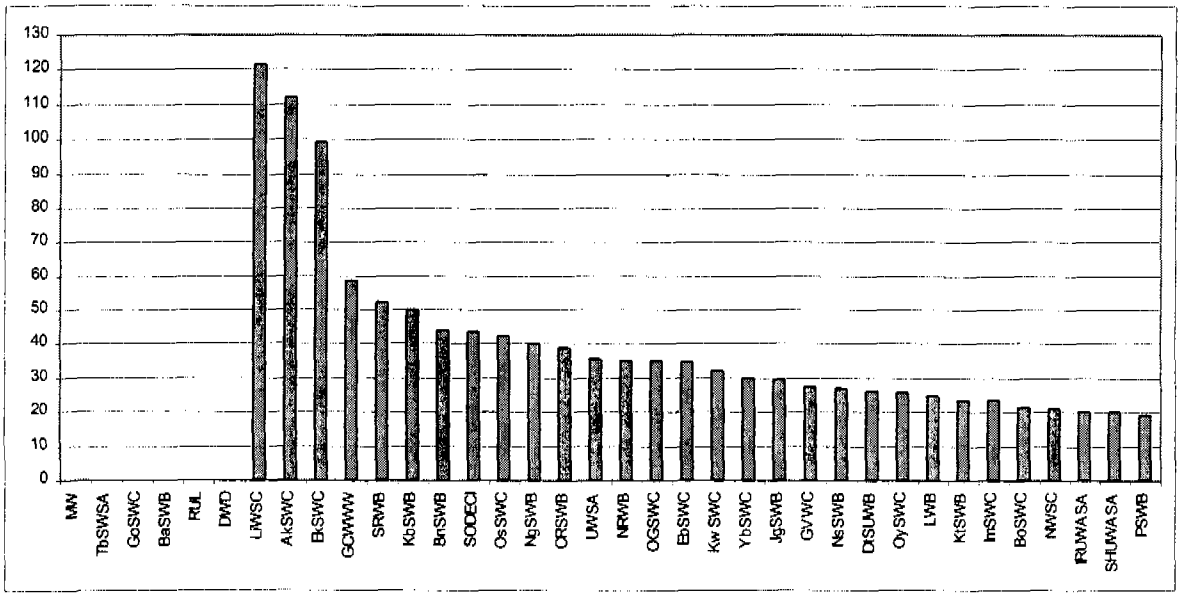
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

$$\frac{\text{Total no. of staff}}{\text{Total no. of connections at year end}} * 1{,}000$$

This indicator is a measure of overall staffing levels. Particular care needs to be taken over small utilities since these may lack the critical mass and economies of scale of larger organisations and may therefore appear relatively over-staffed. This indicator should be viewed alongside 148W which also indicates staffing levels.

93 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Six utilities (on the left side of the top graph) were excluded as outliers since they all reported figures of over 500 staff per 1000 connections. Most utilities report a figure of under 20. Clearly, utilities with lower staff:connections ratios can be considered to be more efficient but, equally, a utility should not be under-staffed such that public health and the environment are put at risk.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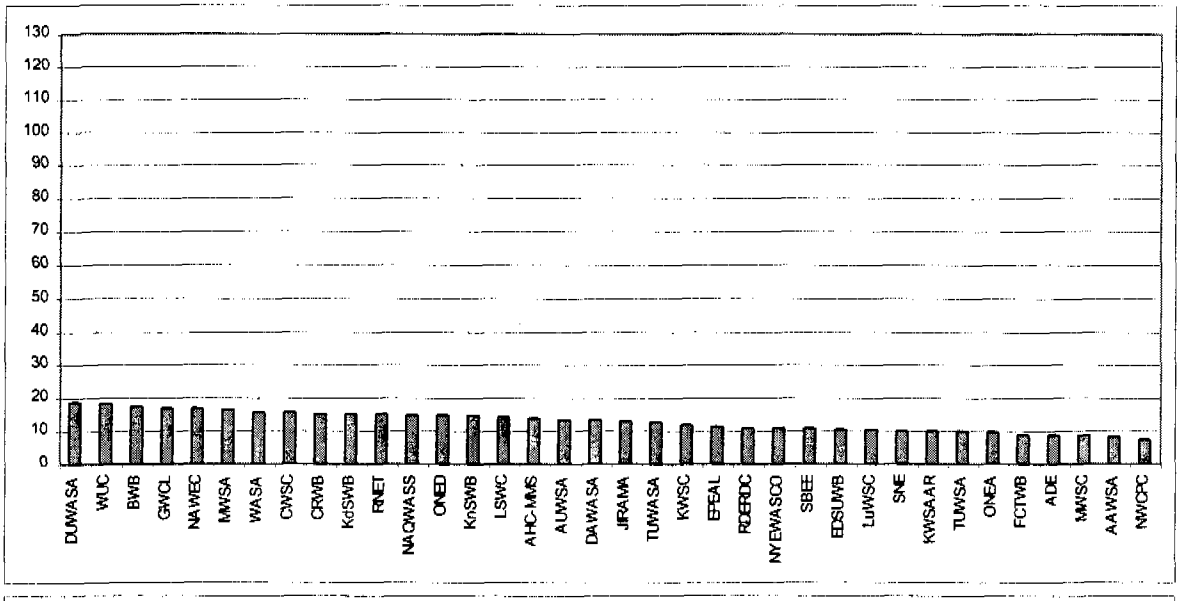
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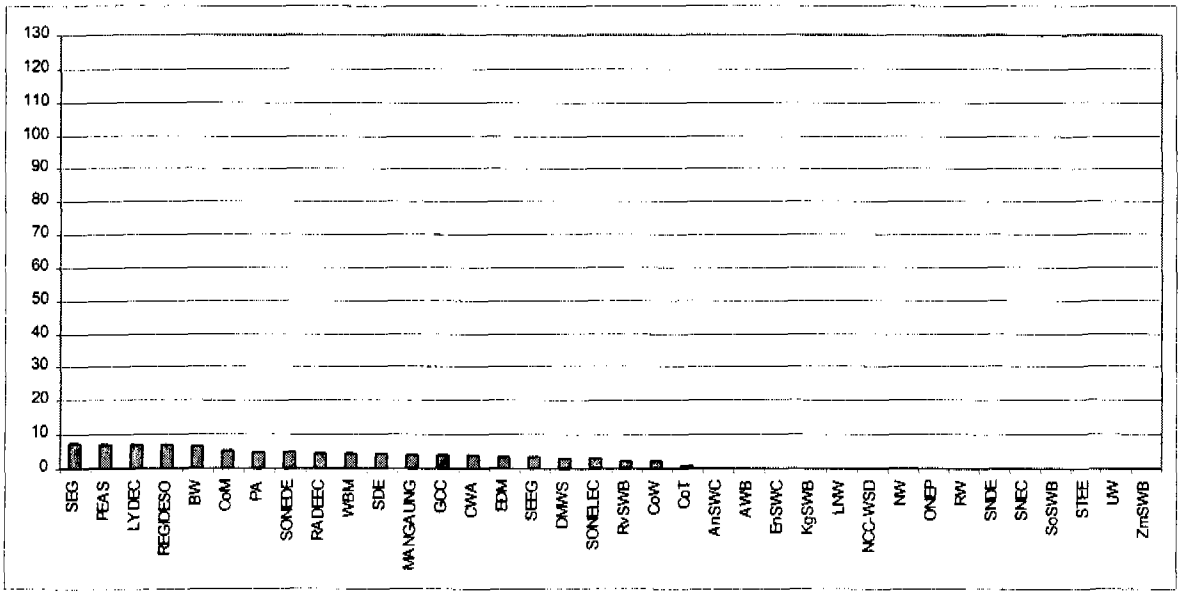
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3.23 148W: Staff per million cubic metres water distributed

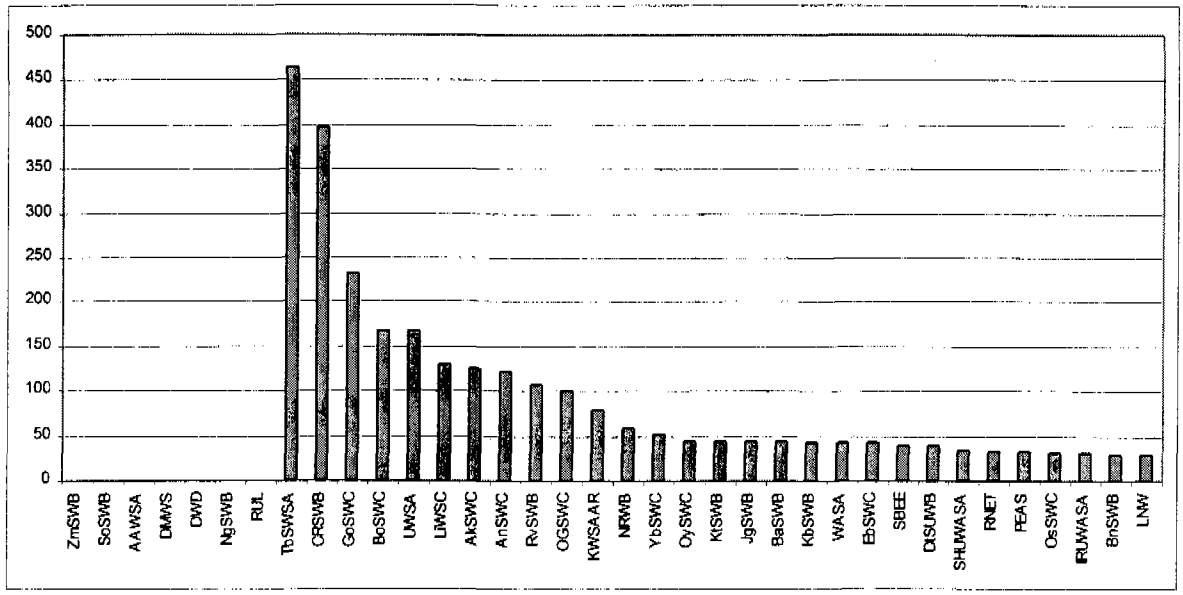
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

$$\frac{\text{Total no. of staff}}{\text{Volume of water distributed in year (cu.m)}} * 1{,}000{,}000$$

This indicator calculates the number of staff per million cubic metres water distributed per year. It is a measure of overall staffing levels. As for 147W, which should be viewed alongside this indicator, care needs to be taken over small utilities since these may lack the critical mass and economies of scale of larger organisations and may therefore appear relatively over-staffed.

99 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. 7 utilities (on the left side of the top graph) were excluded as outliers since they all reported figures of over 500 staff per million cubic metres water distributed per year. Clearly, utilities with lower ratios can be considered to be more efficient but, equally, a utility should not be under-staffed such that public health and the environment are put at risk.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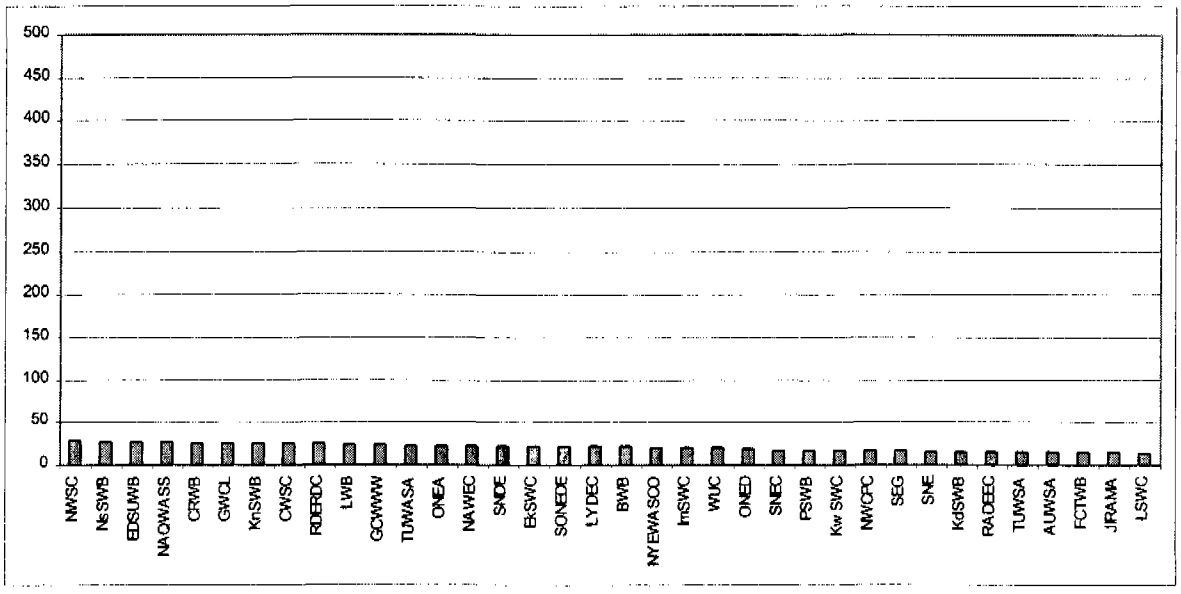
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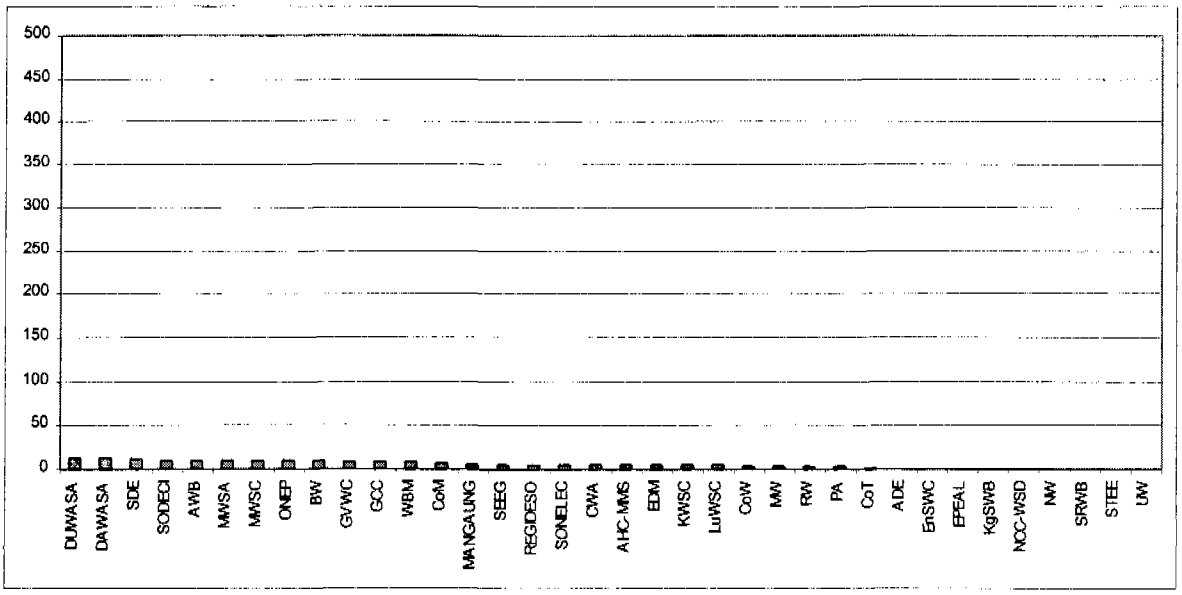
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3.24 152W: Training cost as a % of total payroll

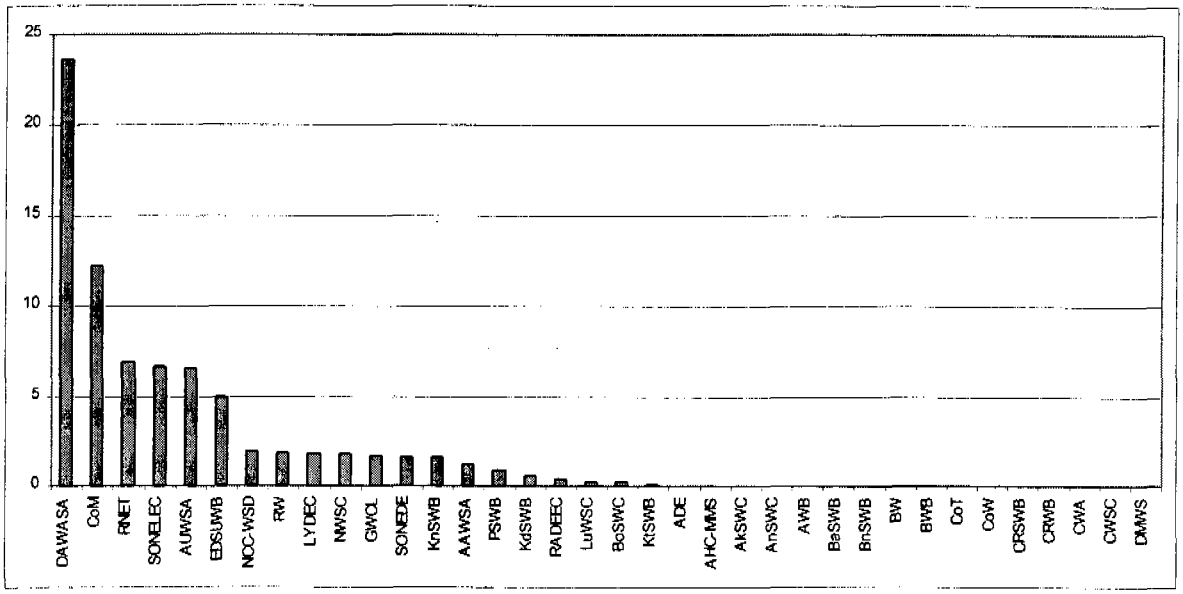
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{Total training costs in year}}{\text{Total payroll in year}} * 100$$

This indicator is a measure of the level of training undertaken by a utility. Properly trained and skilled staff are essential for the prudent running of a water utility and under-investment in training can lead to public health, environmental and health and safety problems. Only costs borne by the utility are included – costs borne by government or other organisations are excluded.

20 utilities provided data for this indicator. The remaining 9 utilities to submit a full questionnaire either did not provide data or entered zero. 5 utilities reported values of over 5% of total payroll costs, with the vast majority reporting less than 2%.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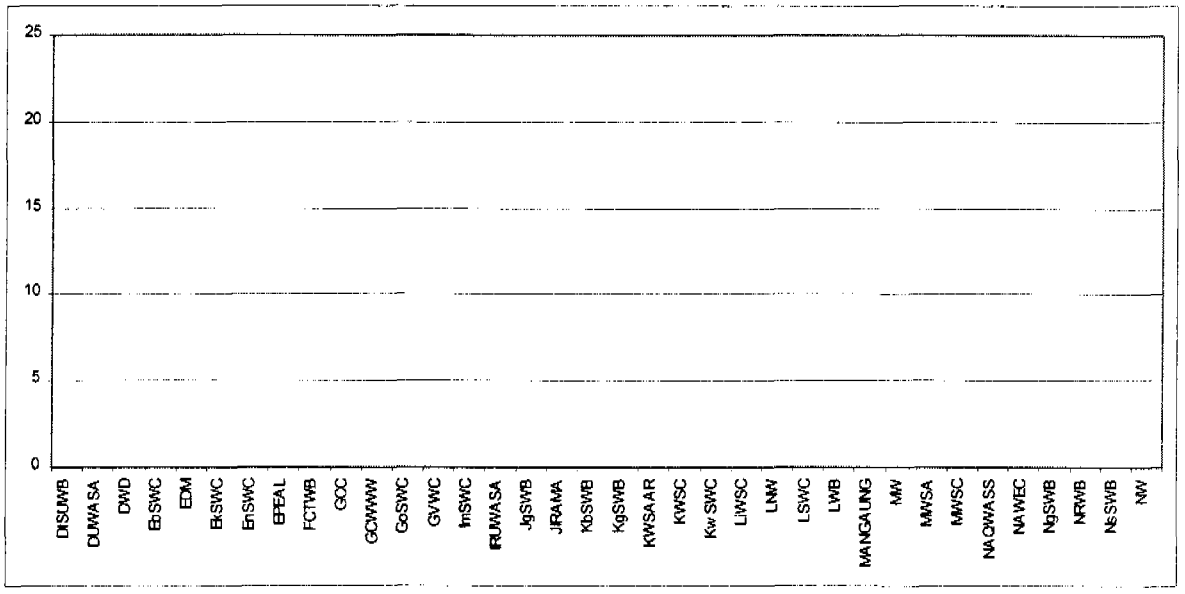
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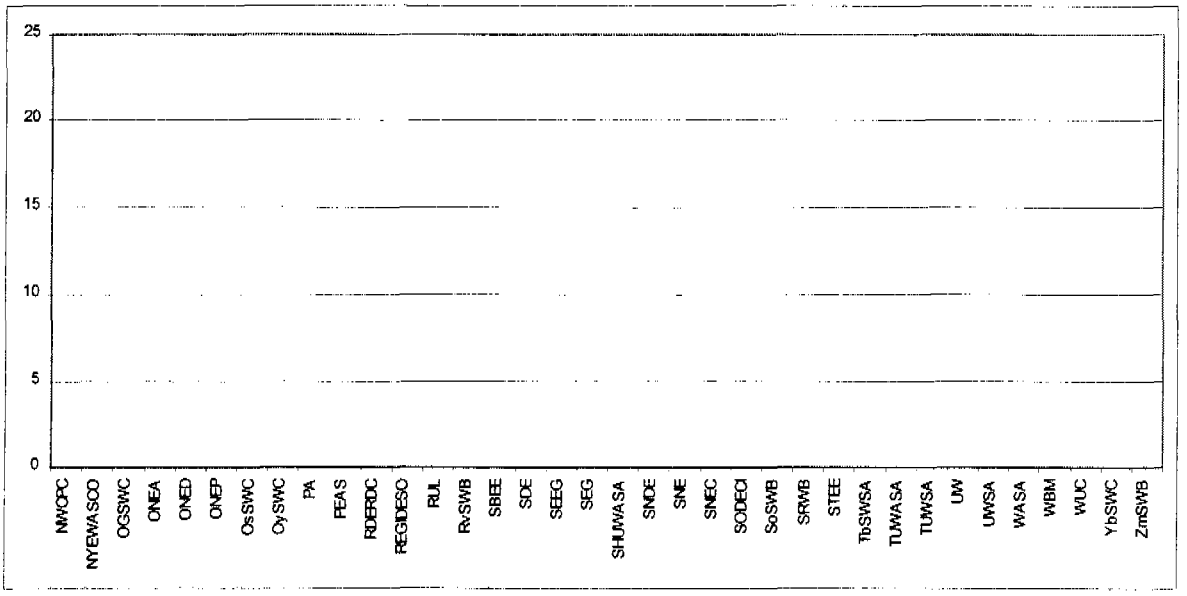
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3.25 156W: Percentage lost days due to accidents

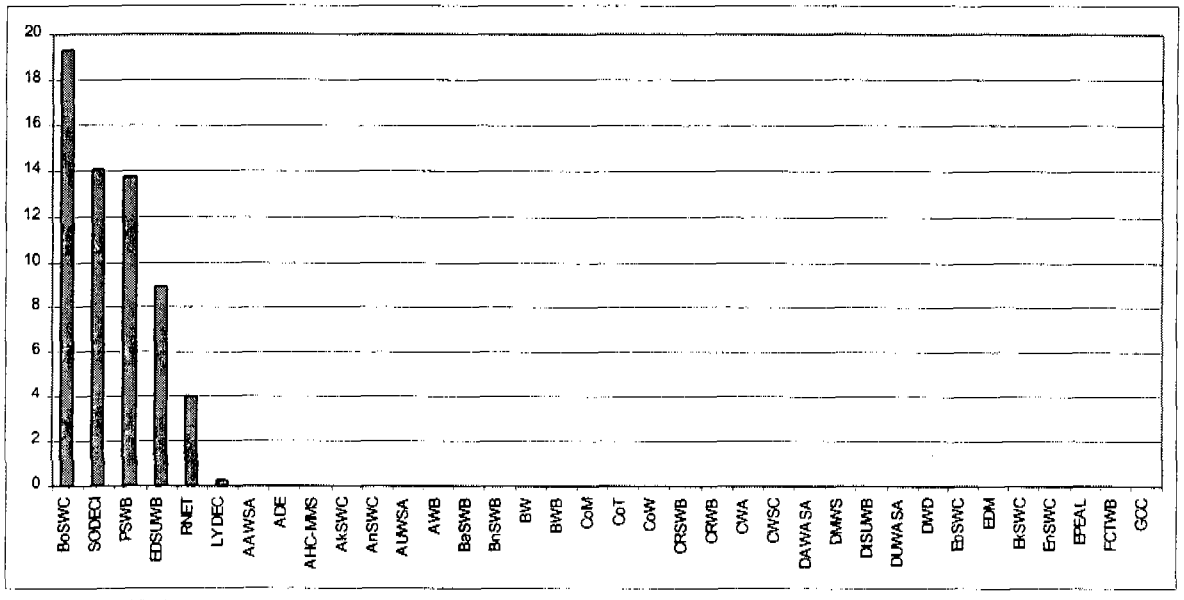
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{Total days lost due to accidents in year}}{\text{Total days worked in year}} * 100$$

This indicator is a measure of the health and safety record of the utility. Utilities should clearly be aiming for a low accident rate and this can be achieved through proper training and supervision. Only days lost due to injury at work are included – sick leave, compassionate leave and annual leave are excluded. The total days worked in the year is the total for all staff, i.e. the average days worked per year per staff member multiplied by the number of staff.

6 utilities provided data for this indicator. The remaining 23 utilities to submit a full questionnaire either did not provide data or entered zero. Values range from almost zero to 19 percent of days lost due to accidents. Against an ultimate target of zero, anything over a few percent appears excessive.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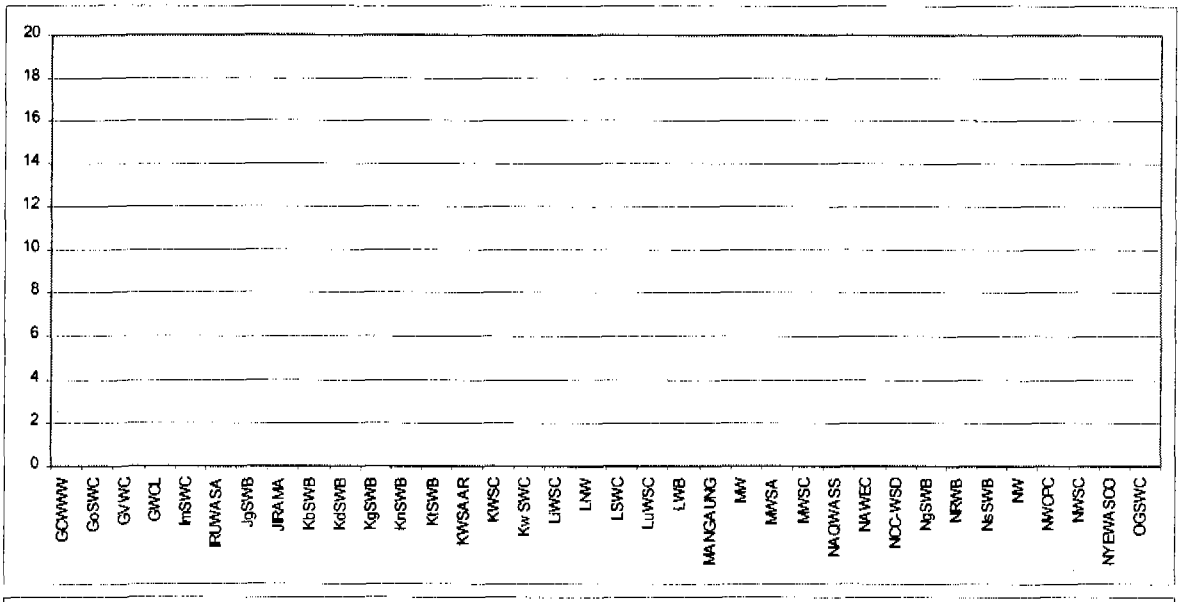
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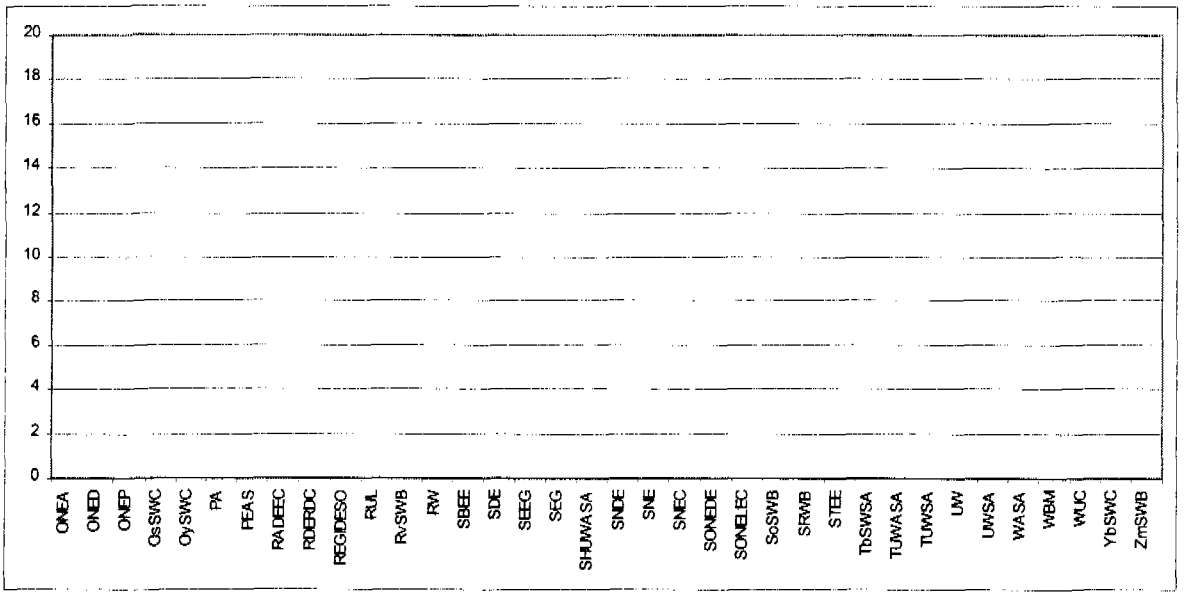
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3.26 162W: Average tariff (US$ per cu.m)

Included in the water-only questionnaire (Y/N)?	Y

The indicator is calculated as:

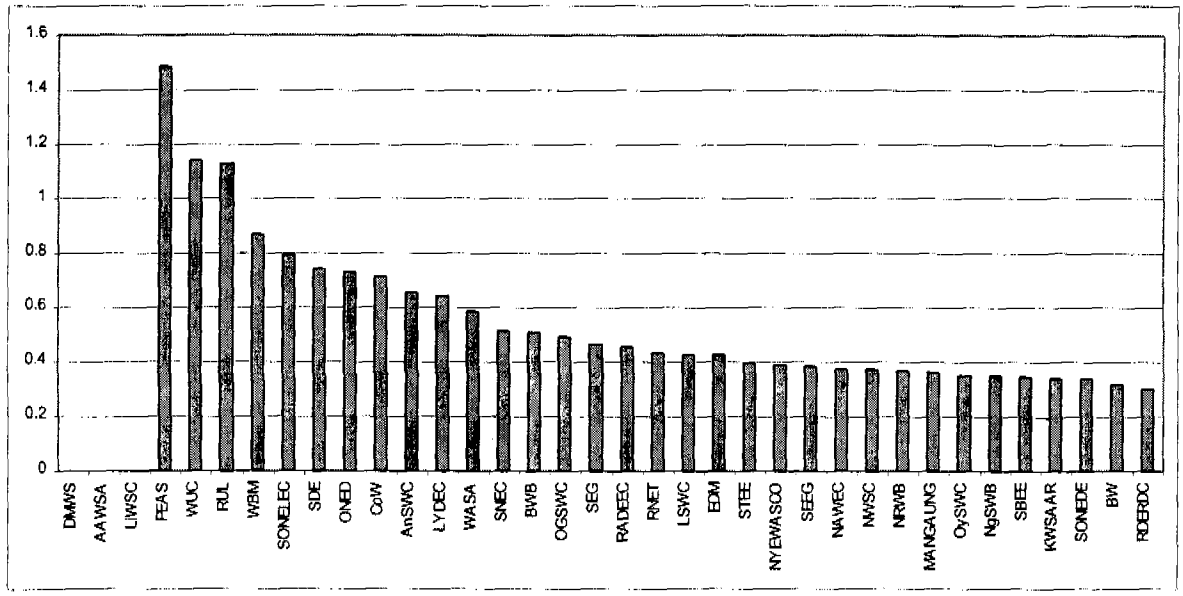
$$\frac{\text{Total direct tariff revenue in year (US\$)}}{\text{Total legitimate consumption in year (cu.m)}}$$

Units: US$ per cubic metre

This indicator measures the notional average tariff of the utility. Utilities should clearly be aiming to provide a good service to customers whilst keeping charges as low as possible. This is the first of a series of revenue indicators and should be viewed alongside the other revenue indicators, particularly 166W, tariff cost recovery, to determine if customers are charged the true cost of supply. The indicator is a notional tariff only and will not be the same as tariffs actually charged, which may include tariff bands and different tariffs for domestic and industrial customers. Tariffs were input in local currency and do not compare easily, particularly over time. However, an effort to make the tariffs more comparable has been made by converting each currency into US dollars (see Appendix A for the conversion factors).

The direct tariff revenue for the reporting year is the actual amount billed for water services. Domestic, commercial and industrial revenue is included but wholesale revenue is excluded. Revenue from other sales, sundry income or interest received are excluded, as are direct revenue subsidies.

96 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Three utilities (on the left side of the top graph) were excluded as outliers since they all had figures of over 60 US dollars per cubic metre. There is quite a large degree of variability in the values, which may in part be attributed to the difficulty in converting to a base currency as well as genuine differences in relative charging levels. For the UK utilities, the notional average tariffs lie mostly in the range 0.7 to 1.3, which is at the most expensive end of the spectrum when compared with the African utilities.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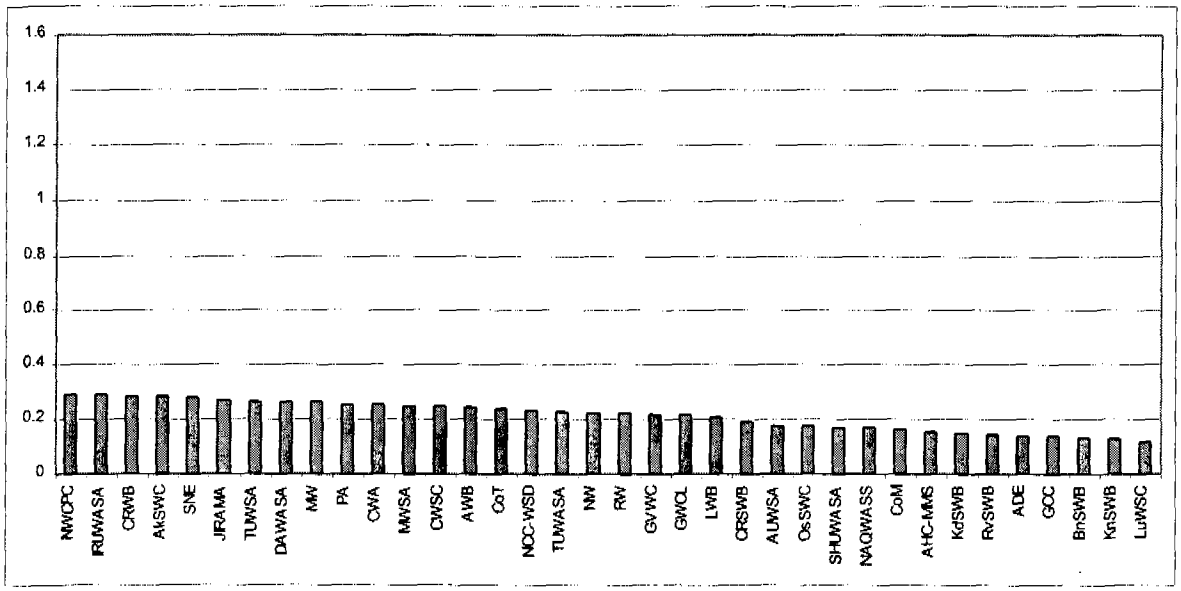
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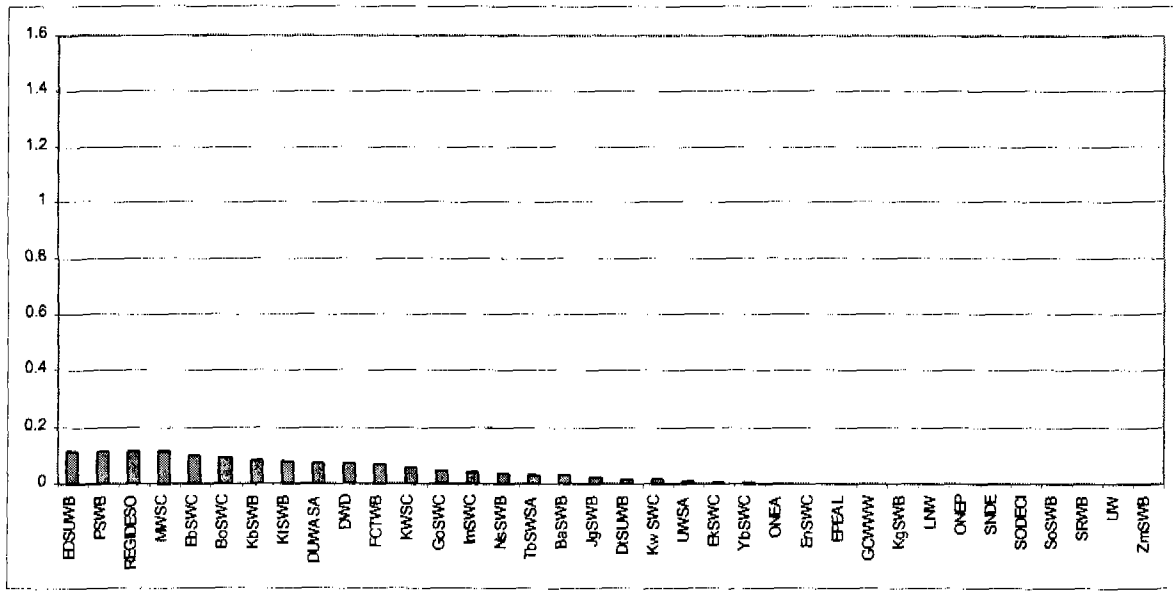
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EREAL
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3.27 166W: Tariff cost recovery

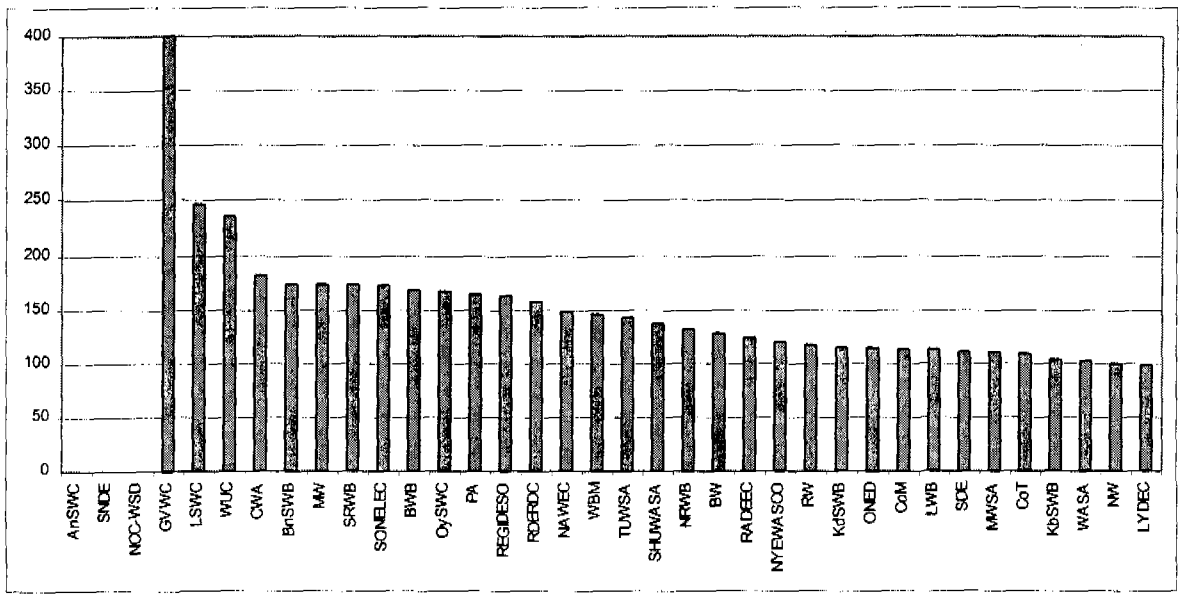
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

$$\frac{\text{Total direct tariff revenue in year}}{\text{Total operating and maintenance costs in year}} * 100$$

This indicator measures the tariff cost recovery of the utility. This is a key measure of a utility's ability to cover its operating and maintenance costs (excluding interest and depreciation) from revenues, without reliance on external subsidies, and is generally perceived as an indication of a commercial approach to the provision of a public service. The aim is for utilities to score at least 100, which indicates that tariff revenues are just enough to cover operating and maintenance costs. This indicator should be viewed alongside the other revenue indicators to get an overall picture of a utility's performance in this area.

98 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Three utilities (on the left side of the top graph) were excluded as outliers since they reported very large figures. 35 of the 98 utilities (36%) have scores of over 100, which represents the minimum level at which utilities should operate. For the UK utilities, the tariff cost recovery values lie mostly in the range 150 to 250, which is at the higher end of the scale when compared with the African utilities.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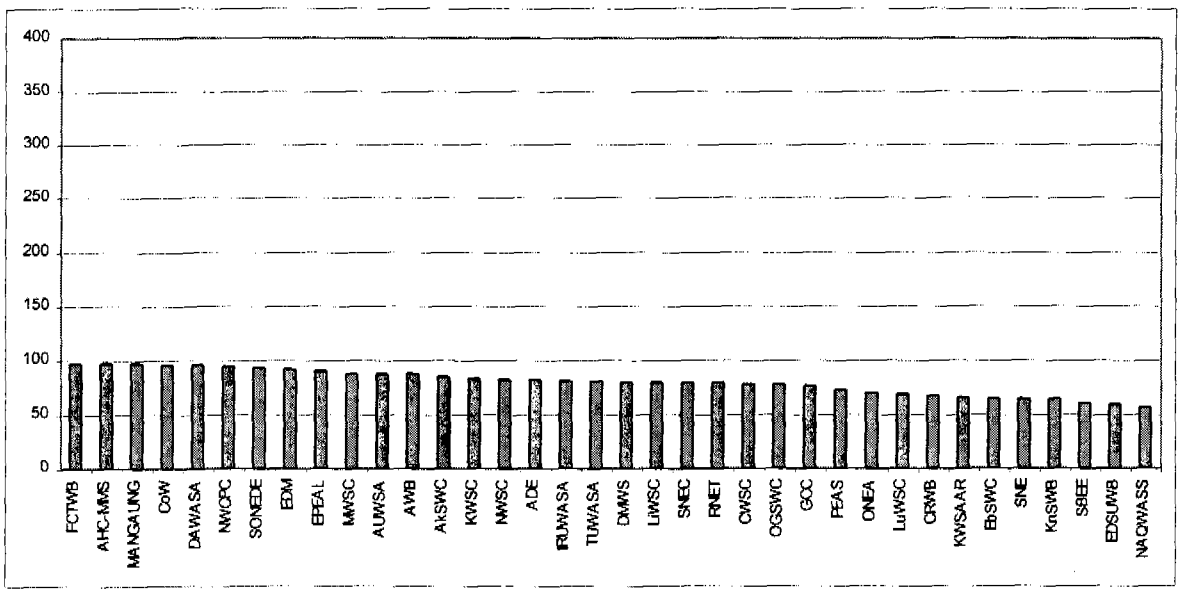
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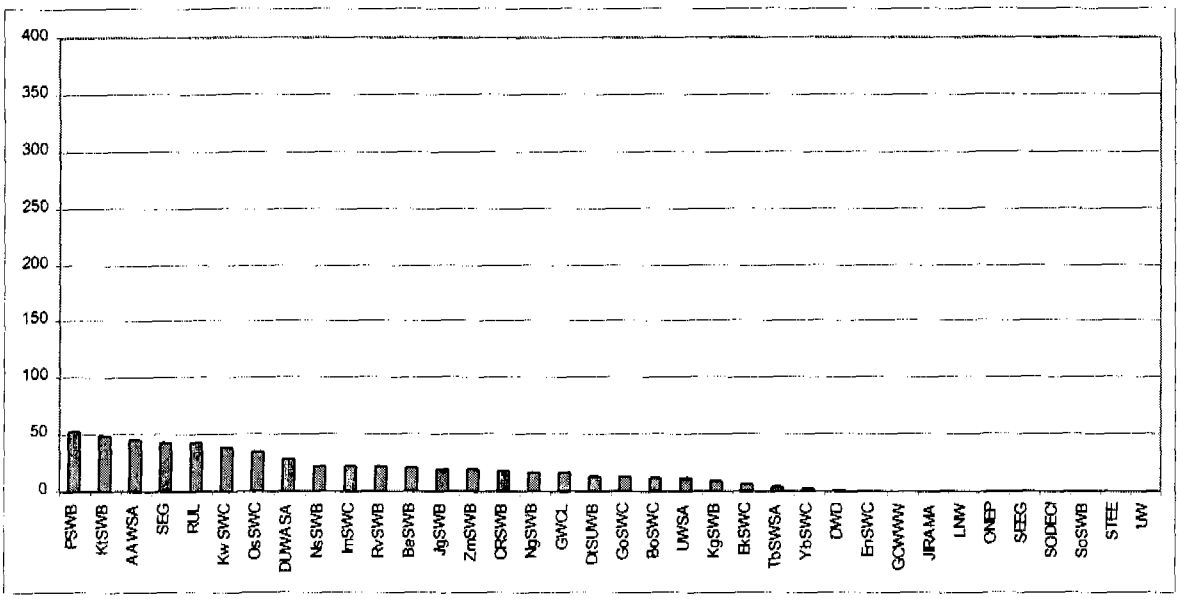
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3.28 170W: Revenue collection efficiency

Included in the water-only questionnaire (Y/N)?	**Y**

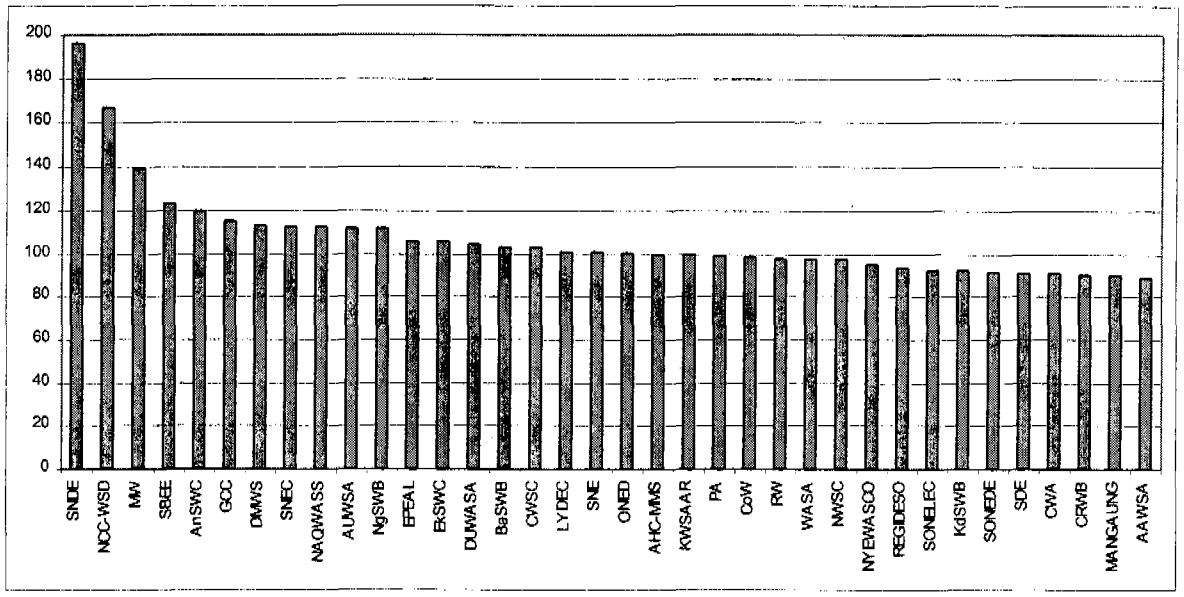
The indicator is calculated as:

$$\frac{\text{Total revenue collected in year}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator measures the revenue collection efficiency of the utility. This shows how much revenue has been collected compared with how much has been billed in the reporting year. It is clearly in the utilities' interests that the revenue collection efficiency should be maximised. It is possible to score greater than 100 for this indicator since revenue left uncollected from last year may be collected this year and added to the billed revenue this year. A more complex indicator would identify how much that should have been billed has actually been billed since significant discrepancies can often be uncovered here.

This indicator should be viewed in conjunction with the other revenue indicators. In particular, utilities which score well in this indicator would also be expected to perform well for 174W, average debtor days, which is an indicator of the level of customer debt outstanding.

97 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. 35 of the 97 utilities (36%) have scores of over 90. It should be the aim of utilities to score as near to 100 as possible over a sustained period of time.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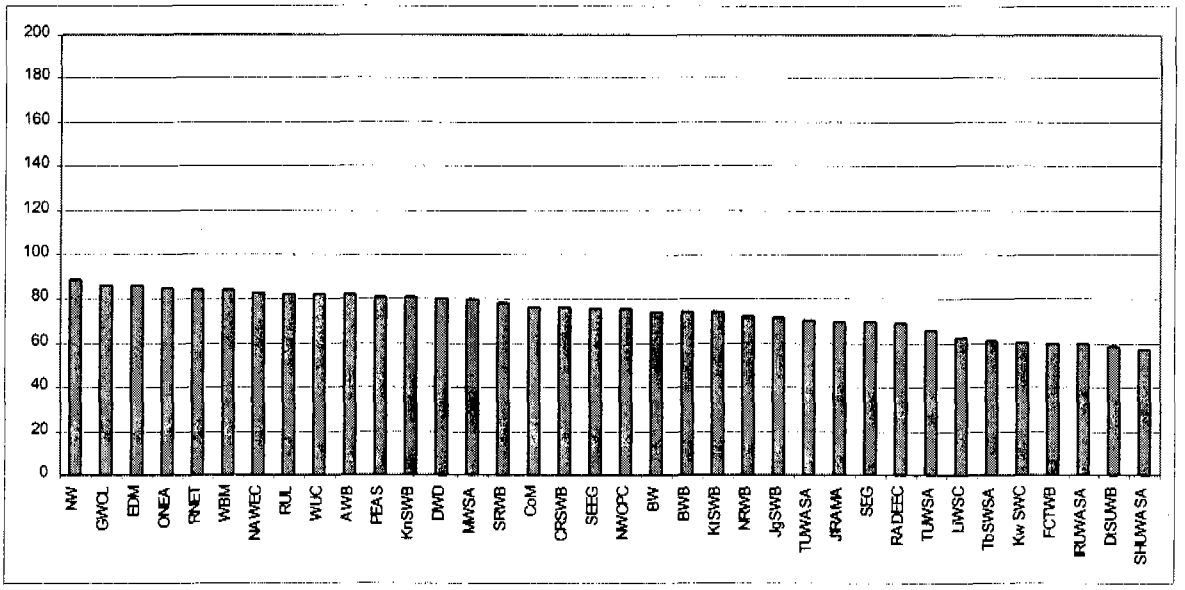
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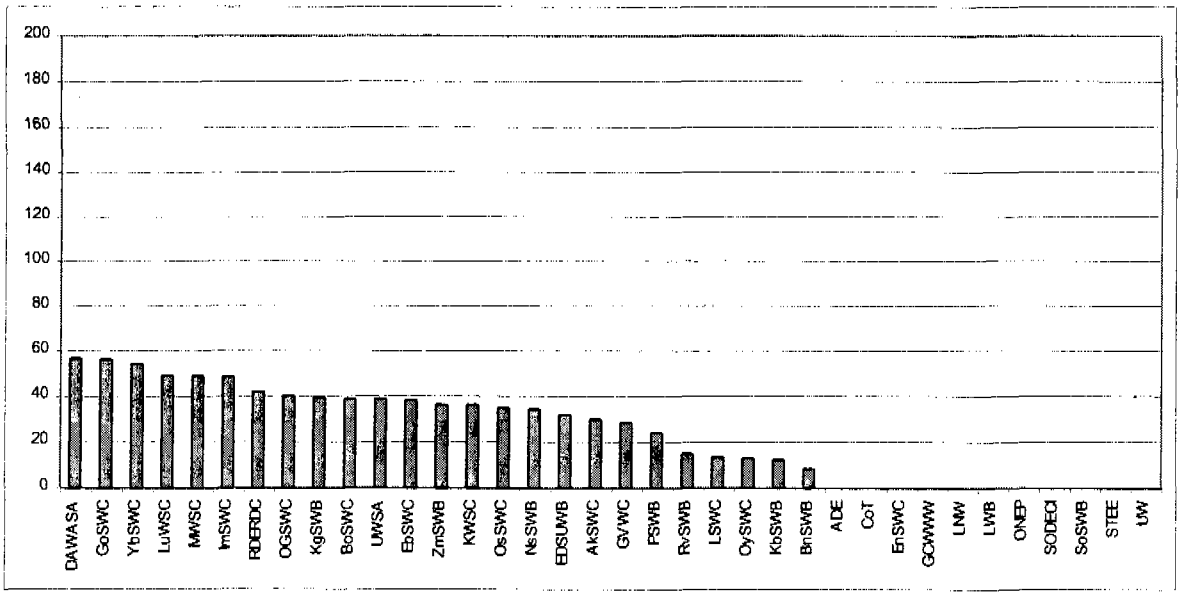
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3.29 174W: Average debtor days

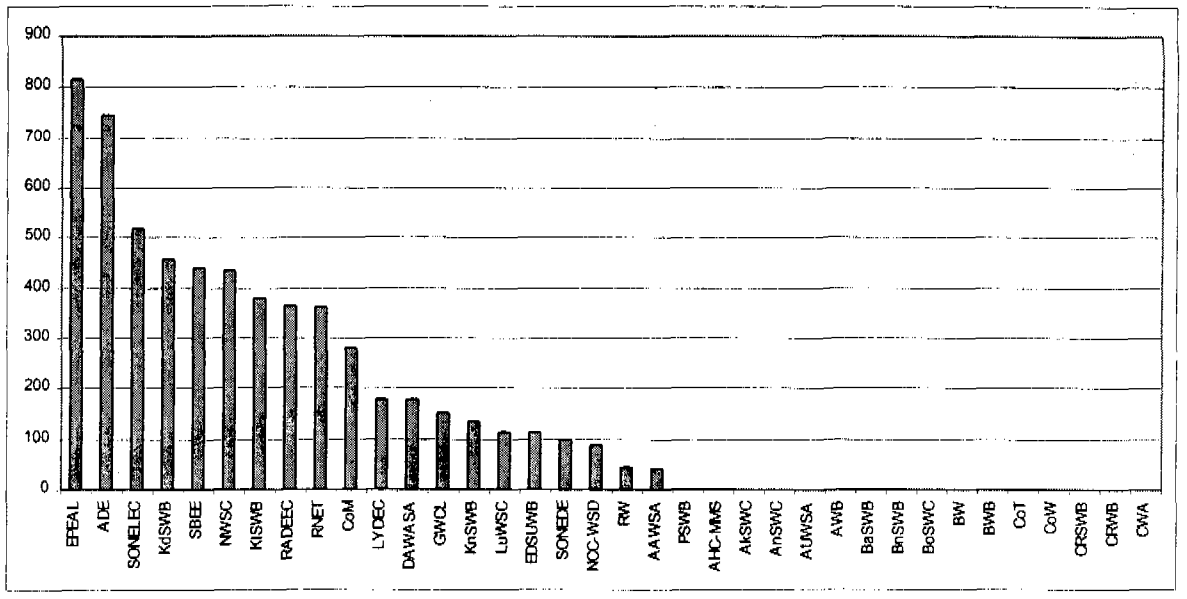
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{Accounts receivable at year end}}{\text{Total direct tariff revenue in year}} * 365$$

This indicator is a measure of the outstanding customer debt at year end. It is measured in terms of the number of days' worth of billings outstanding. It is clearly in utilities' interests to minimise this number and this indicator should be viewed in conjunction with the other revenue indicators, in particular 170W on revenue collection efficiency.

21 utilities provided data for this indicator. The remaining 8 utilities to provide full questionnaires either did not provide data or entered zero. 7 of the 21 utilities (33%) have scores of over 365 which implies that they have over a year's worth of billings outstanding at year end.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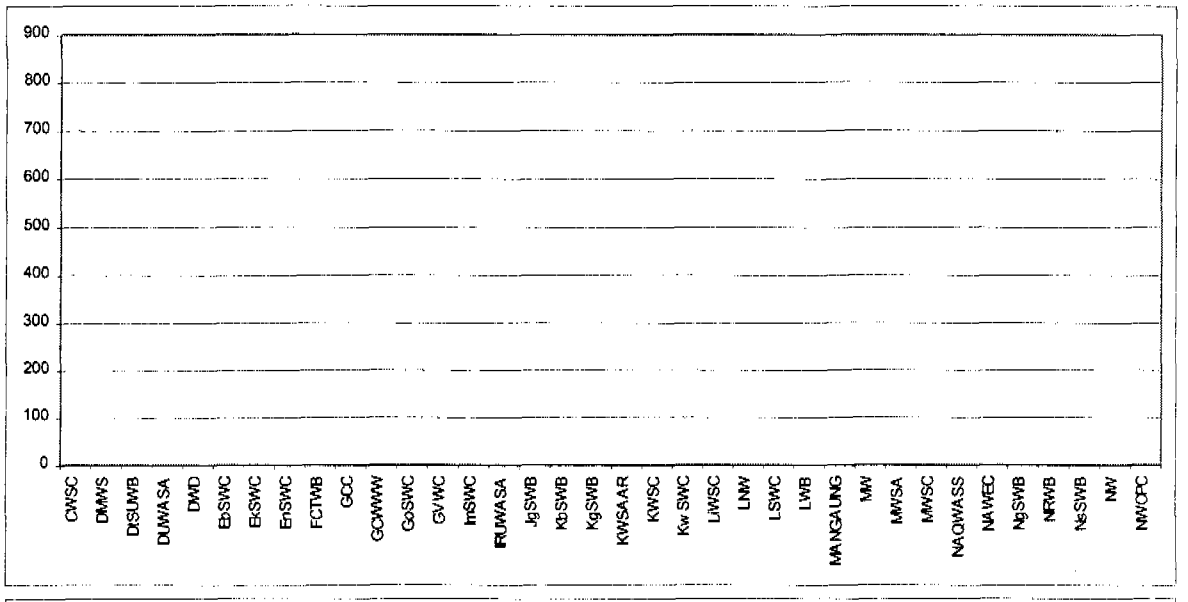
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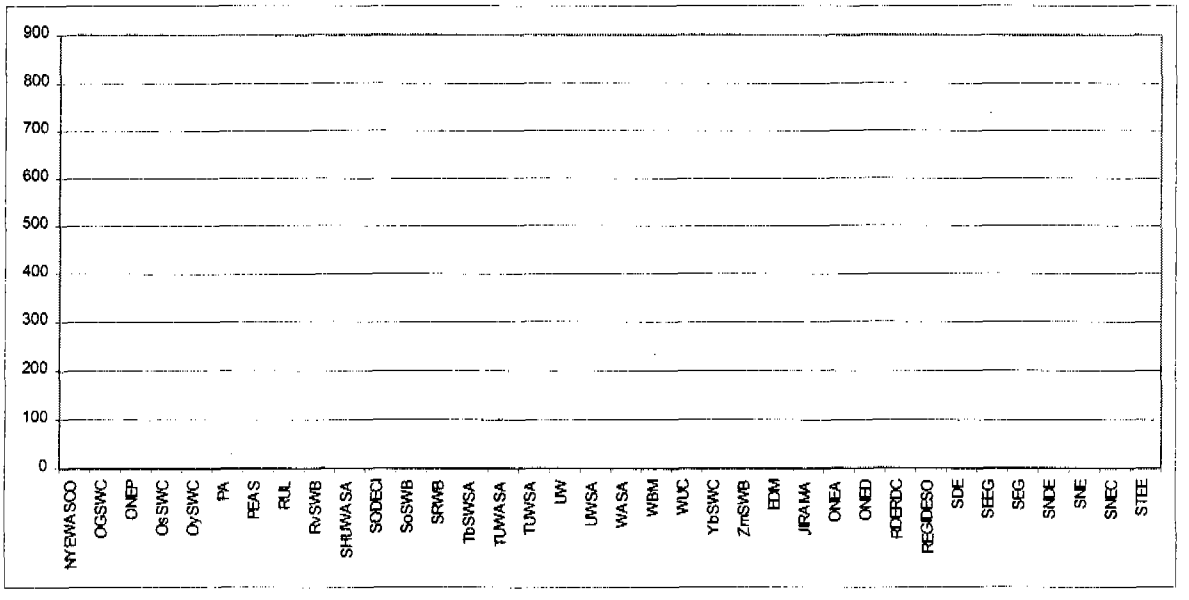
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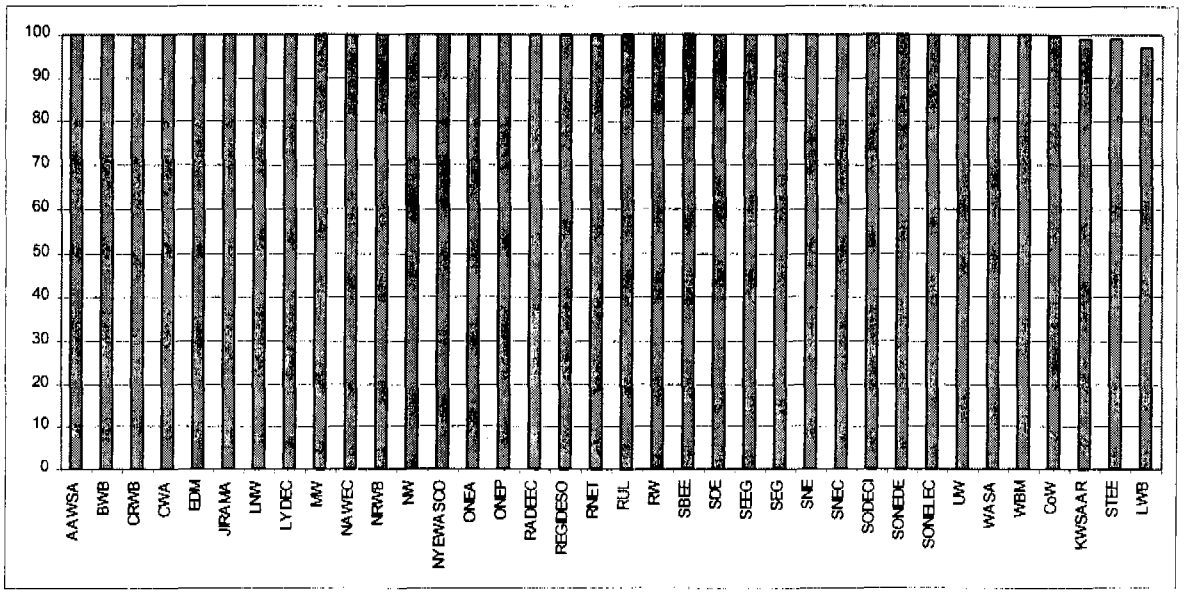
3.30 176W: Percentage of customers metered

Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is input directly by the user.

This indicator is a measure of the level of metered supply across all customers. Metered supply can help to produce accurate estimates of usage as well as provide an inducement to customers to conserve water.

84 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. 32 utilities report that all of their customers are metered. In the UK, domestic customers are generally not metered whilst most commercial and industrial customers are metered. The percentage metering in the UK across all customers varies between utilities in the range 5 to 45. Generally, the higher rates of metering are found in the drier areas of the UK such as the south-east of England.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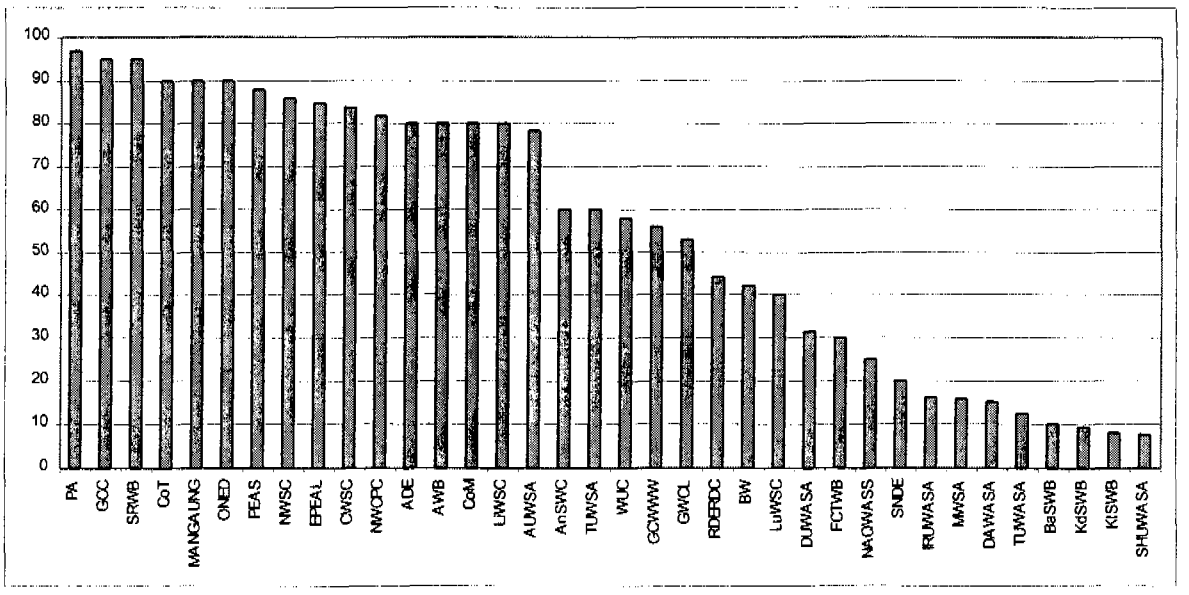
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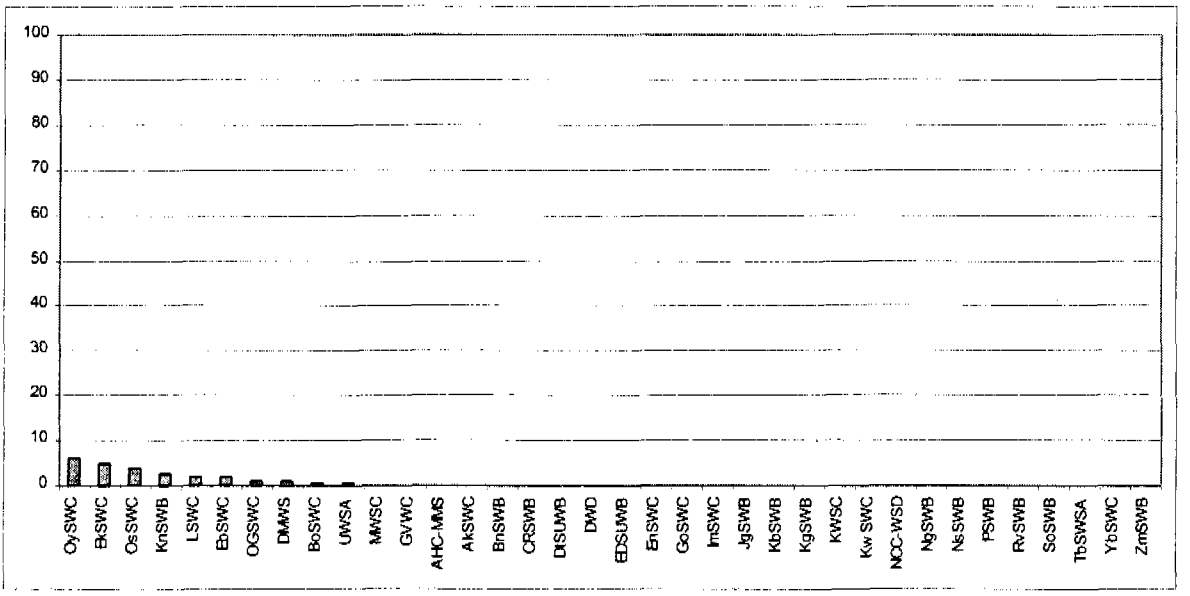
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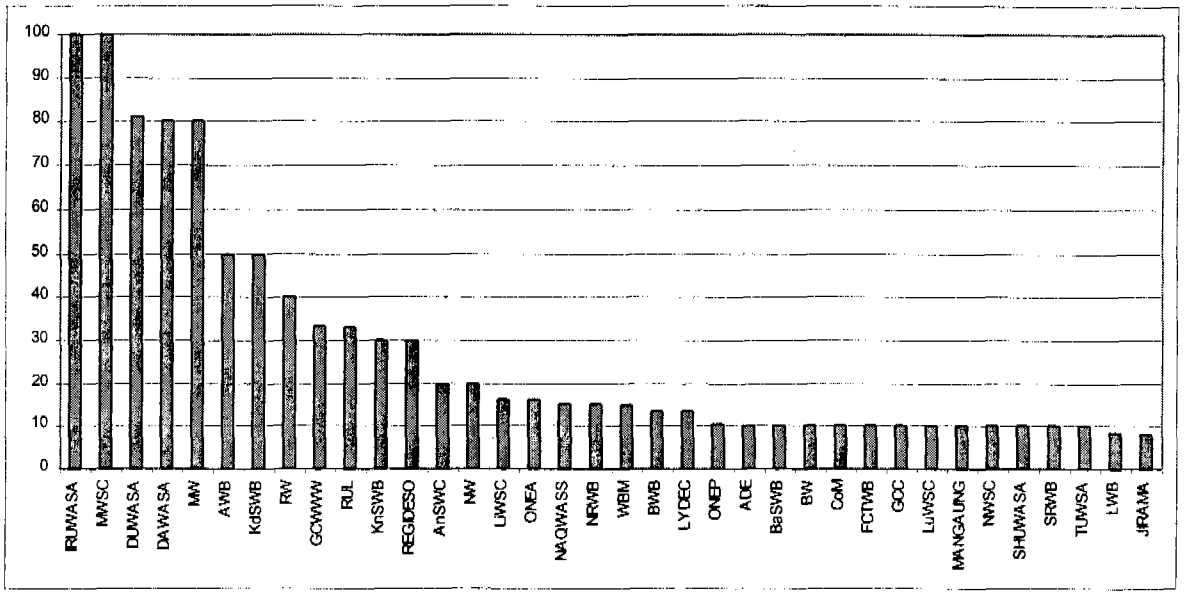
3.31 177W: Percentage of meters checked, recalibrated or replaced

Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is input directly by the user.

This indicator is a measure of the level of accuracy of meters since meters which have been checked, recalibrated or replaced will be more accurate than meters which have not. This indicator therefore has a link to those indicators which require a measurement of customer demand since if a utility has a high percentage here, its customer demand figures may possibly be more accurate than utilities with a low percentage here. This indicator also links to the previous indicator, 176W, which reports the percentage of customers metered.

59 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. The values vary widely from 100% right down to nearly zero. Half of utilities report that they have checked, recalibrated or replaced more than 10% of their meters.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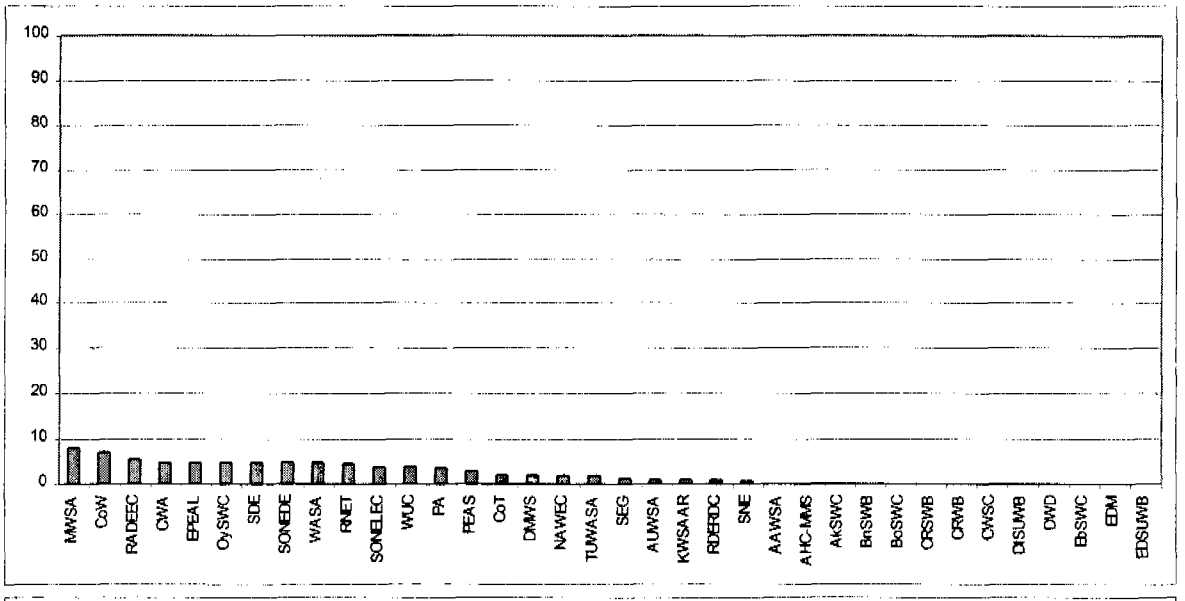
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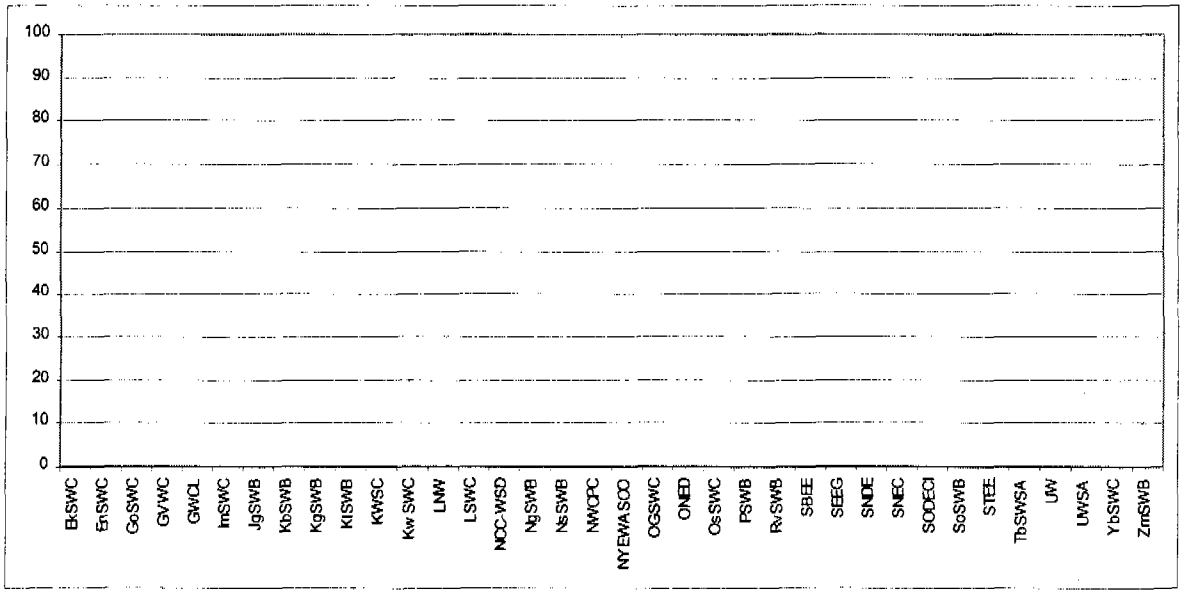
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3.32 179W: Lifeline tariffs

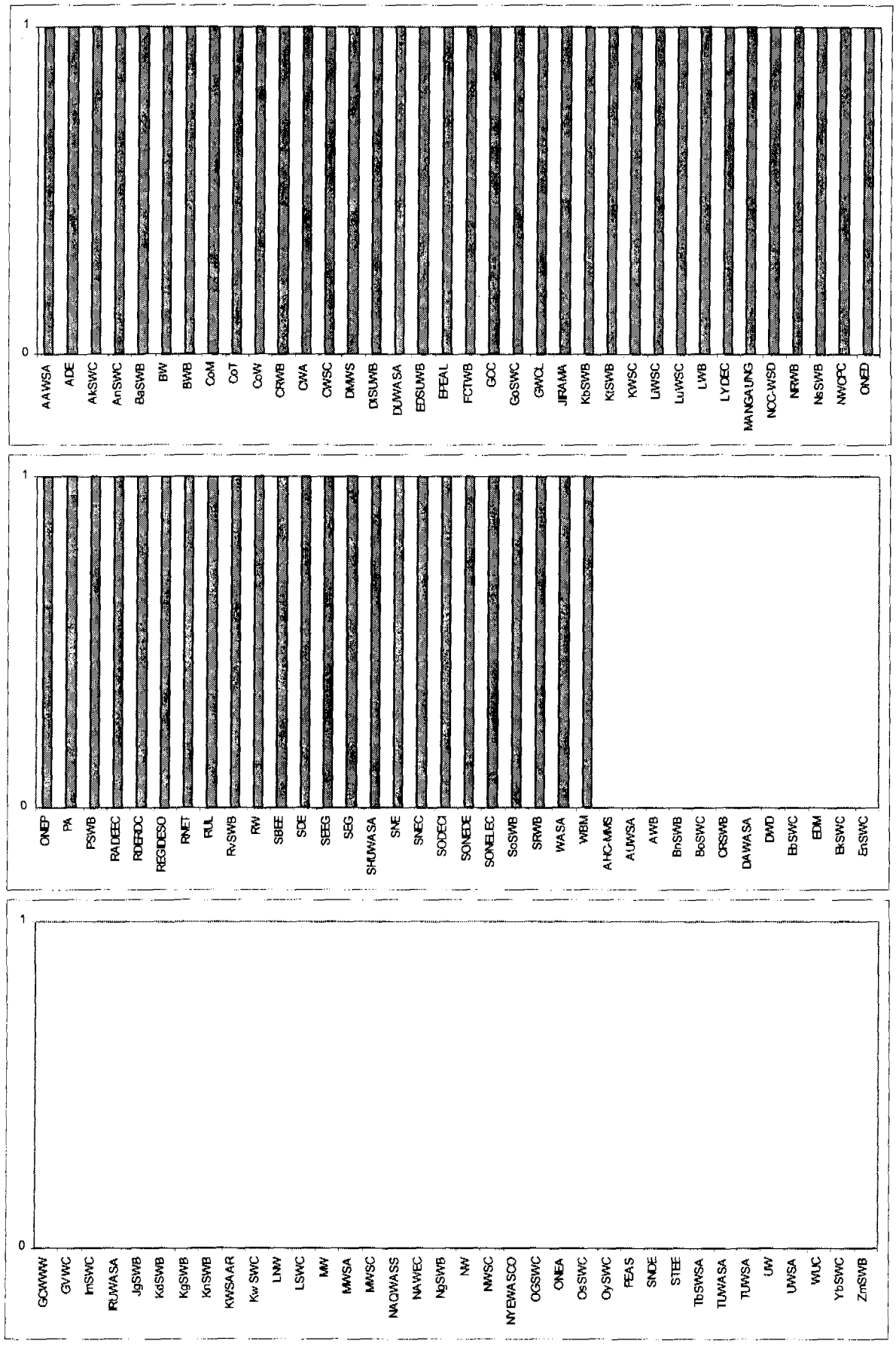
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is simply a Yes/No indicator.

Lifeline tariffs are low or free charges or tariffs for a particular level of water usage, usually judged as sufficient for basic living, and can be used to ensure that the poor can afford the bare minimum amount of water. This indicator identifies those utilities providing such tariffs.

In the graph, 1 means "yes" and 0 means "no".

60 utilities indicate that they do provide a minimum essential volume of water free or at a reduced rate. The remainder either responded negatively or did not respond. The indicator does not provide any details about such tariffs, e.g. what the minimum amount of water is or what charges are made for this water.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3.33 185W: Percentage revenue subsidy

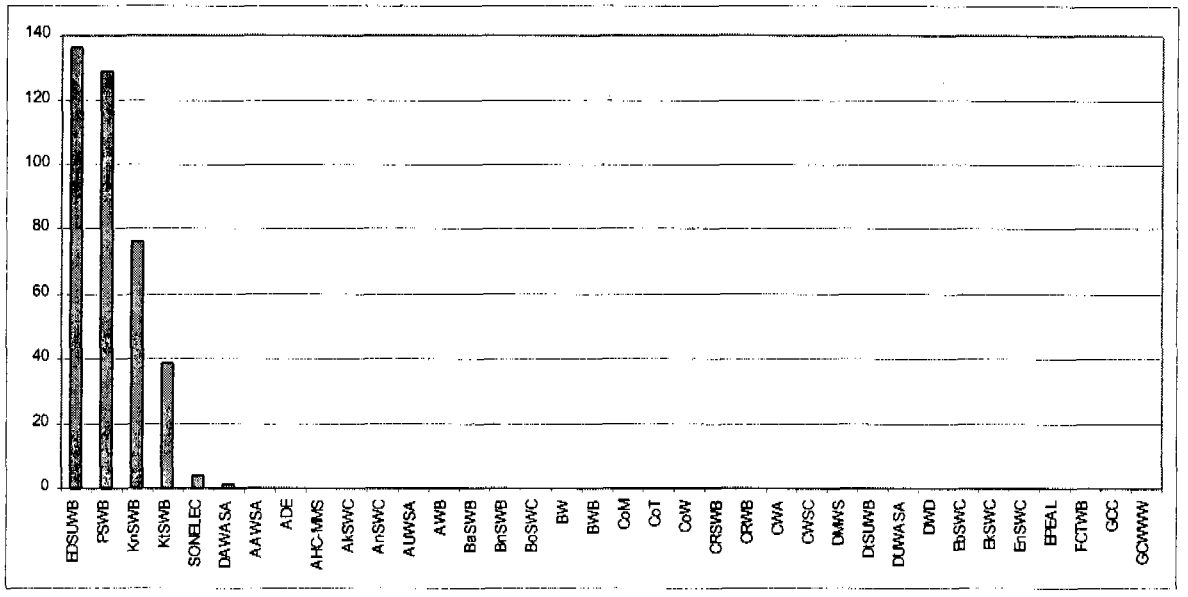
Included in the water-only questionnaire (Y/N)?	N

The indicator is calculated as:

$$\frac{\text{Revenue subsidy received in year}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator calculates the revenue subsidy received in the year as a percentage of total direct tariff revenue. In most countries, revenue subsidies are in decline and are not perceived to be a sustainable basis for operation of the utility. It will therefore be informative to view this indicator over time, as more data is added to the database, to identify trends. Subsidies such as fuel subsidy, import duty subsidy, tax subsidies, capital subsidies, etc. are not included in the revenue subsidy. This indicator links to tariff cost recovery (166W) since it is likely that a utility is carrying a loss for the year if it has a tariff cost recovery of less than 100% and is not receiving a revenue subsidy.

6 utilities provided data for this indicator. The remaining 23 utilities to provide a full questionnaire either did not provide data or entered zero. Two utilities have scores of over 100% which means that revenue subsidy exceeds total direct tariff revenue for the year.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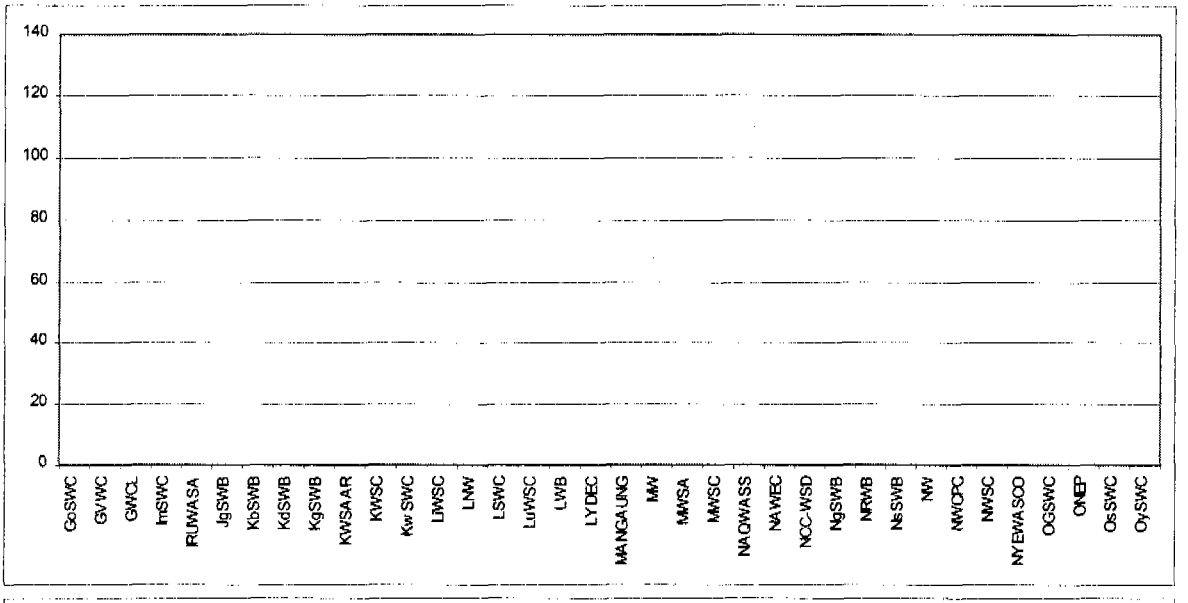
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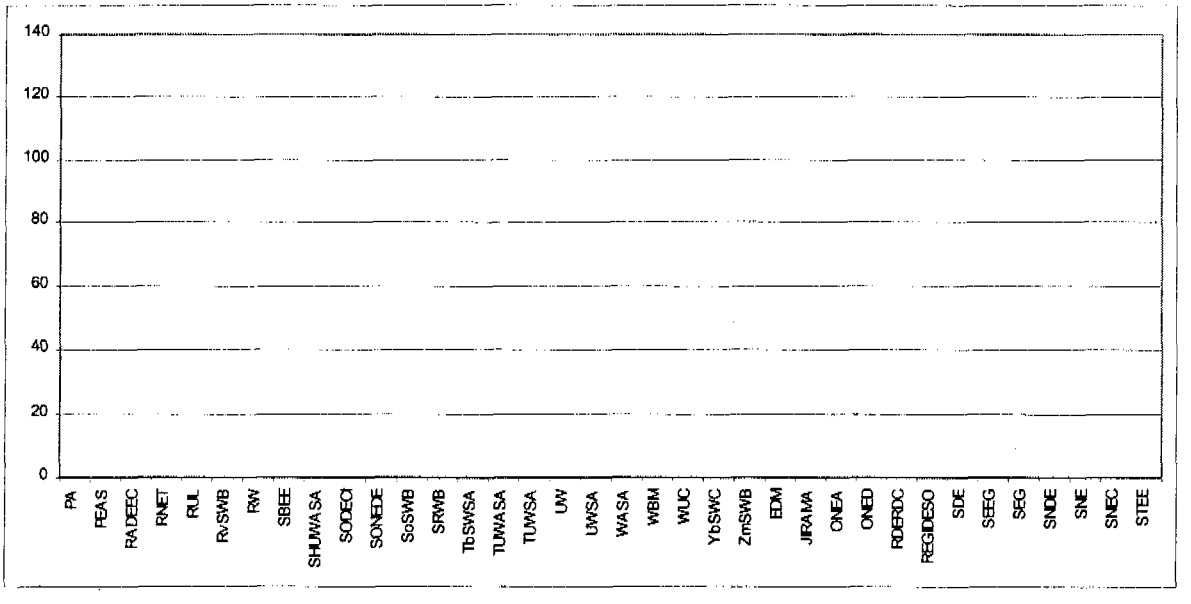
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3.34 187W: Depreciation policy

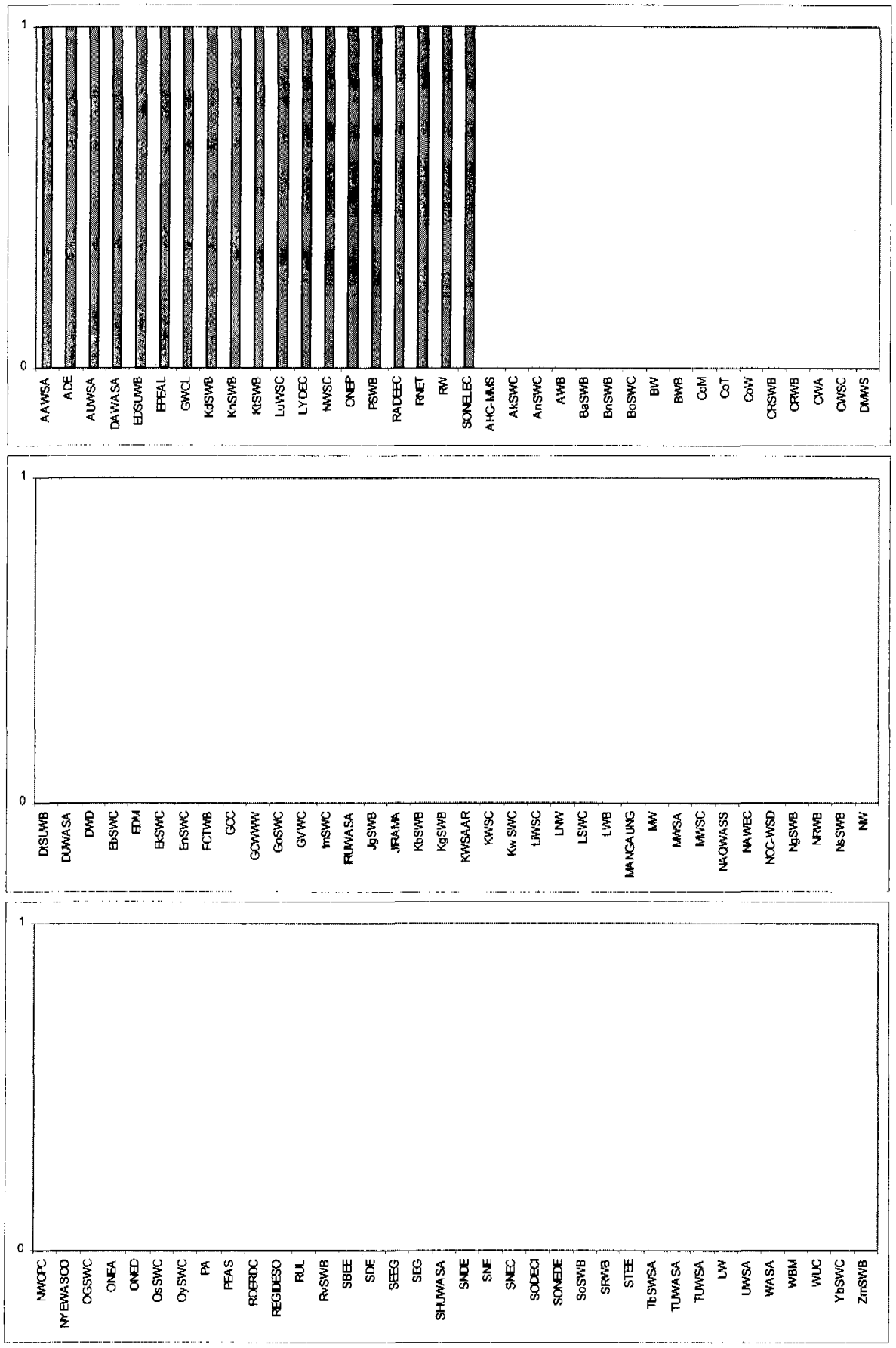
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator identifies those utilities which operate a depreciation policy. This is a formal accounting system which charges the cost of asset ownership to its operations, i.e. the value of assets are written off as their useful life decreases. This is a prudent accounting policy to adopt.

In the graph, 1 means "yes" and 0 means "no".

19 utilities indicate that they do operate a depreciation policy. The remaining 10 utilities to supply a full questionnaire either responded negatively or did not respond. The indicator does not provide any details about the depreciation policy such as asset lives assumed for different types of asset (191W provides an indicator of this for pumps).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3.35 191W: Rate of capital replacement (% per year)

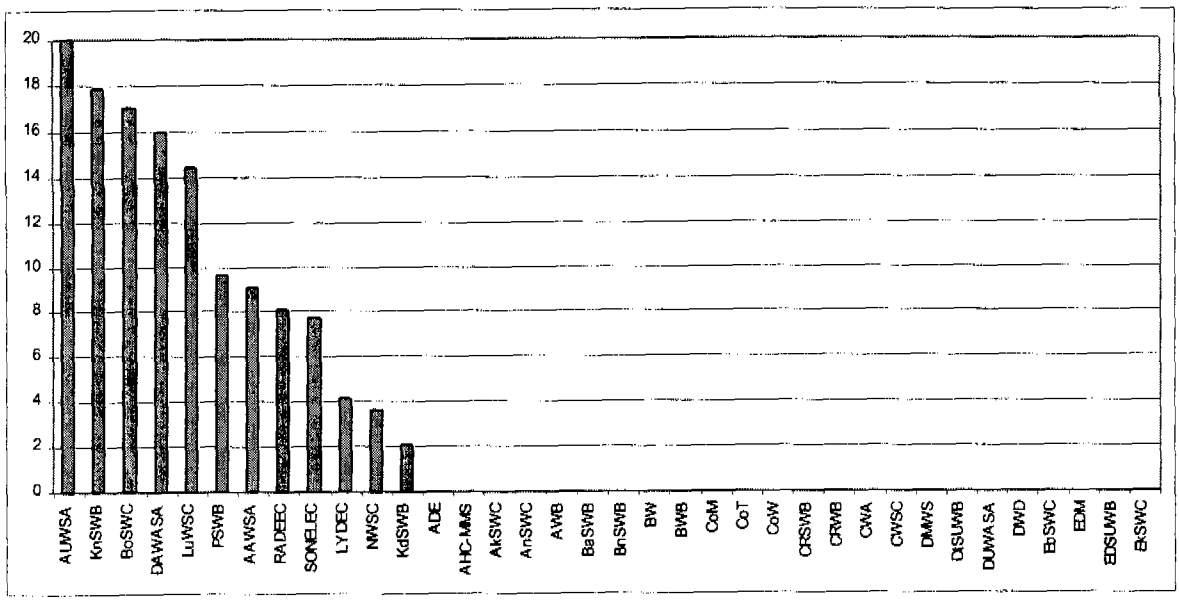
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{No. of pumps replaced in year}}{\text{Total no. of pumps at year end}} * 100$$

Capital assets may often last a long time but they do not last forever. Every utility needs not only to expand and develop its assets to meet new operating demands, but also to replace assets as they wear out. Obviously, the rate at which assets wear out will depend on how they have been maintained, and for every asset there is an optimal replacement time. As a readily available proxy measure of the overall rate of capital replacement, one element of capital assets has been taken - the rate of pump replacement. Abstraction, transmission and delivery pumps are included in the measure but sump pumps, dewatering pumps, chemical dosing pumps, sludge pumps, etc. have been excluded.

12 utilities provided data for this indicator. The remaining 17 utilities to provide a full questionnaire either did not provide data or entered zero. The rates of pump replacement reported vary from 20% down to 2%. This translates to asset lives of 5 years to 50 years if these replacement rates are maintained over the long term.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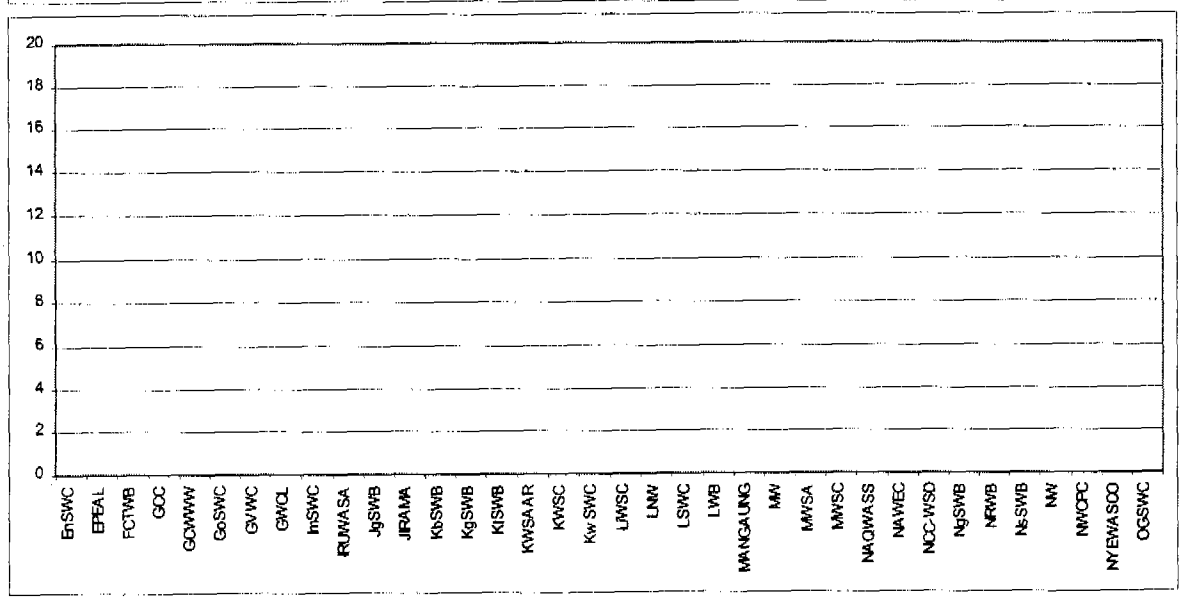
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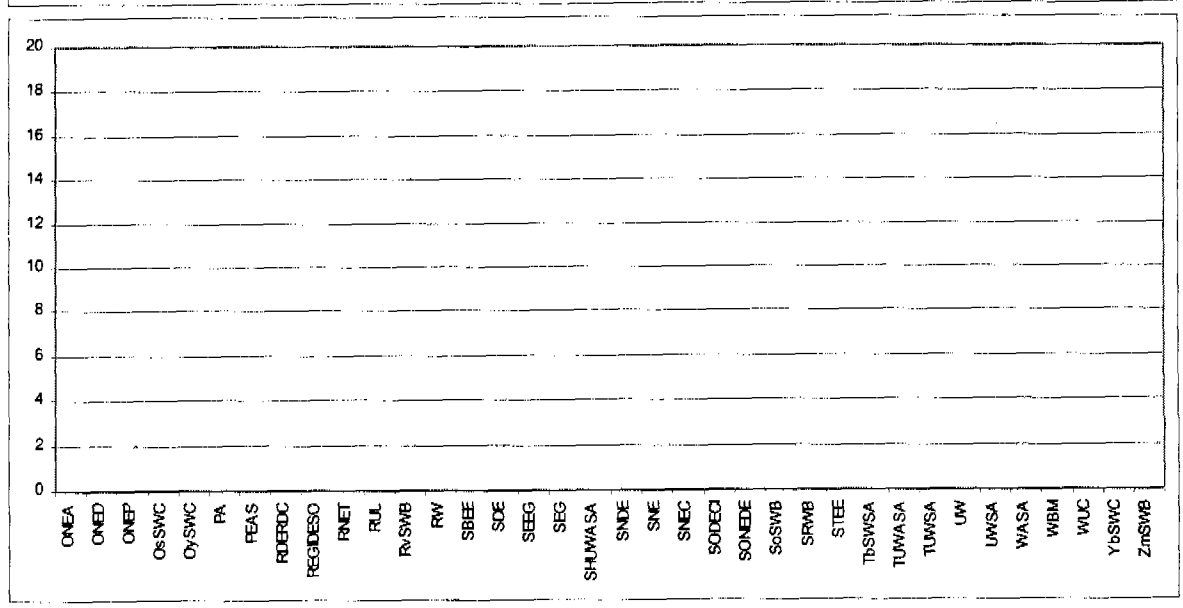
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3.36 205W: Debt service ratio

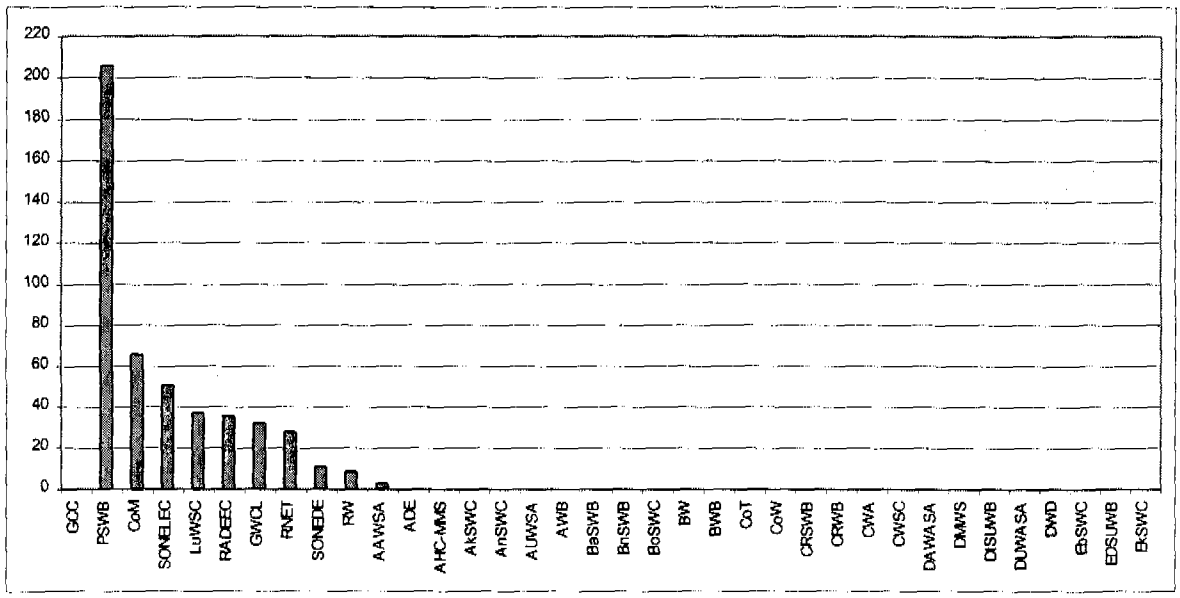
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is calculated as:

$$\frac{\text{Total annual debt service}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator is a measure of a utility's ability to meet its debt service obligations from revenue earned. Revenue will not cover debt service obligations if the score exceeds 100. Annual debt service is the total amount of interest and principal paid during the reporting year, in respect of both long term and short term borrowings and overdrafts. This includes interest and principal which has been capitalised.

11 utilities provided data for this indicator. The remaining 18 utilities to provide a full questionnaire either did not provide data or entered zero. One utility was omitted as an outlier (GCC). One utility reports a debt service ratio of greater than 100, which means that its revenue does not cover its debt service obligations.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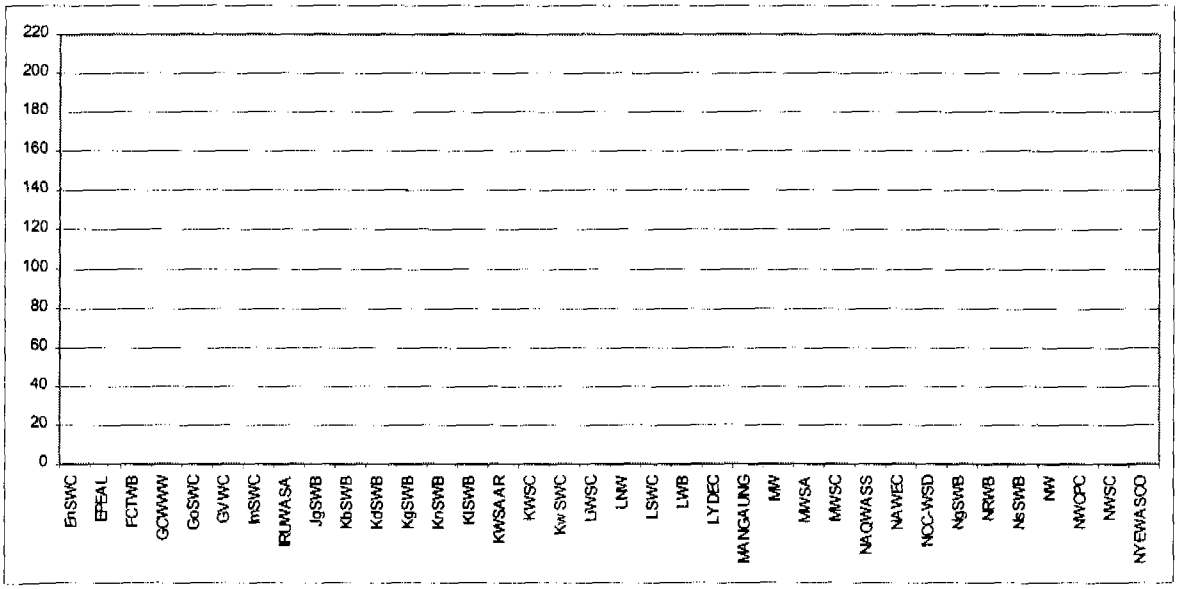
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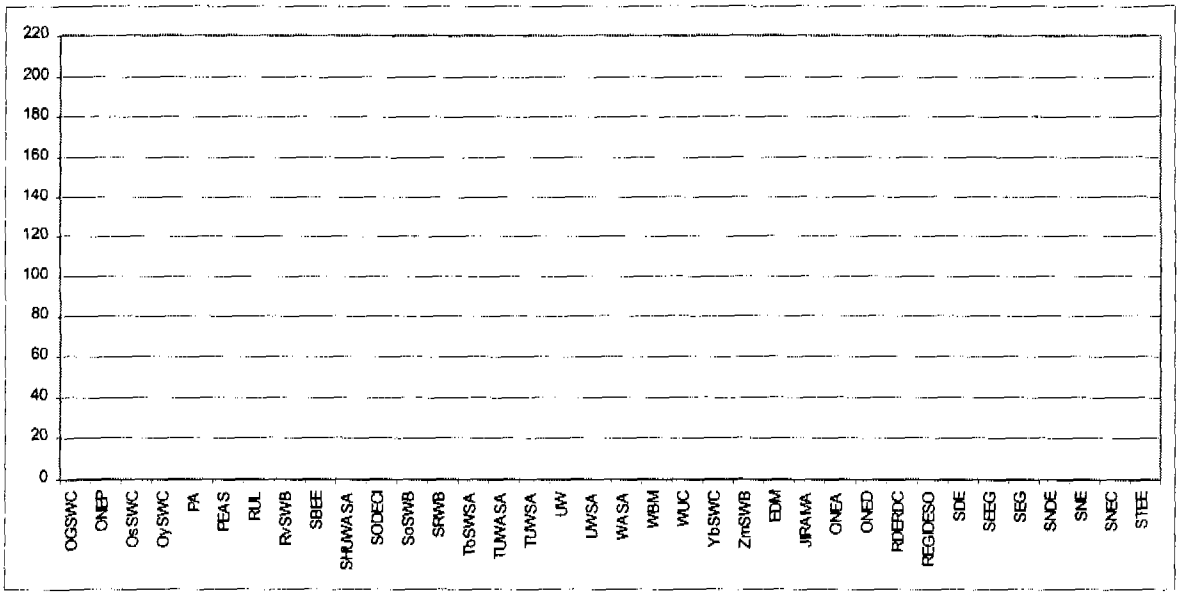
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3.37 209W: Current liquidity ratio

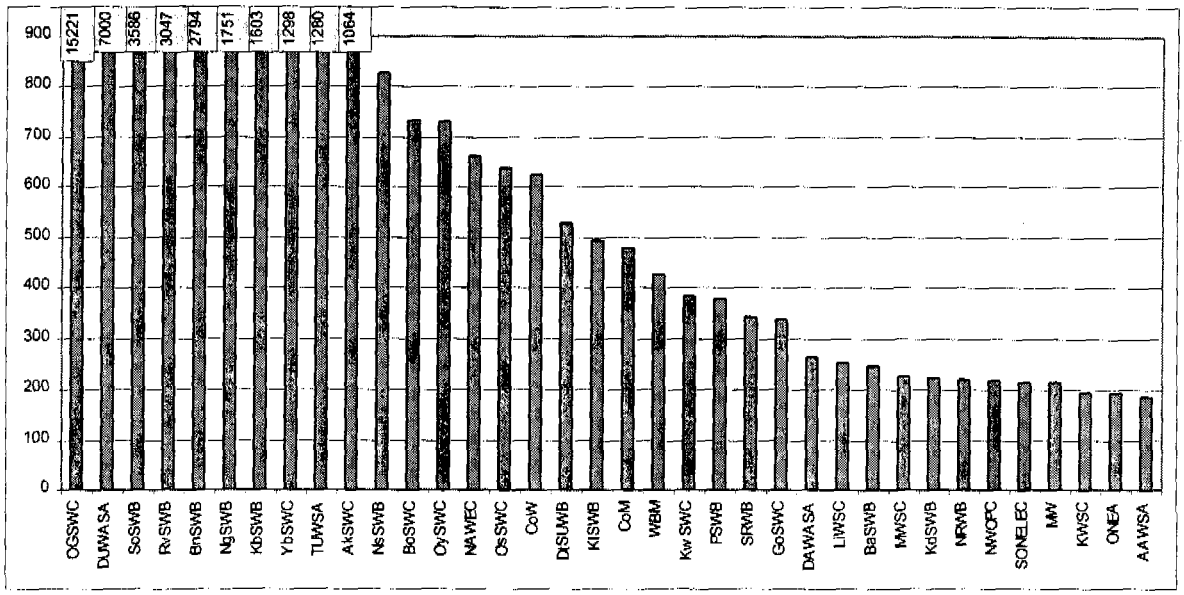
Included in the water-only questionnaire (Y/N)?	**Y**

The indicator is calculated as:

$$\frac{\text{Total current assets}}{\text{Total current liabilities}} * 100$$

This indicator is the current liquidity ratio, which measures a utility's ability to meet its current liabilities from its current assets, i.e. whether there are enough resources to hand to meet present financial commitments. The current assets and liabilities figures are available from the Balance Sheet. Current assets include cash, stock, debtors and other short-term assets. Current liabilities include overdrafts, short-term borrowings, money owed to suppliers (creditors) and any other short-term liabilities. This indicator should be viewed alongside other financial indicators, particularly the debt service ratio (205W). Utilities with scores under 100 have more liabilities than assets and are financially over-committed.

80 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. 10 utilities have a value of greater than 1000 and, for the sake of greater clarity in the graph, the scale has been limited and the 10 utilities' values are made explicit. 23 of the 80 utilities (29%) have scores under 100 and so have more liabilities than assets.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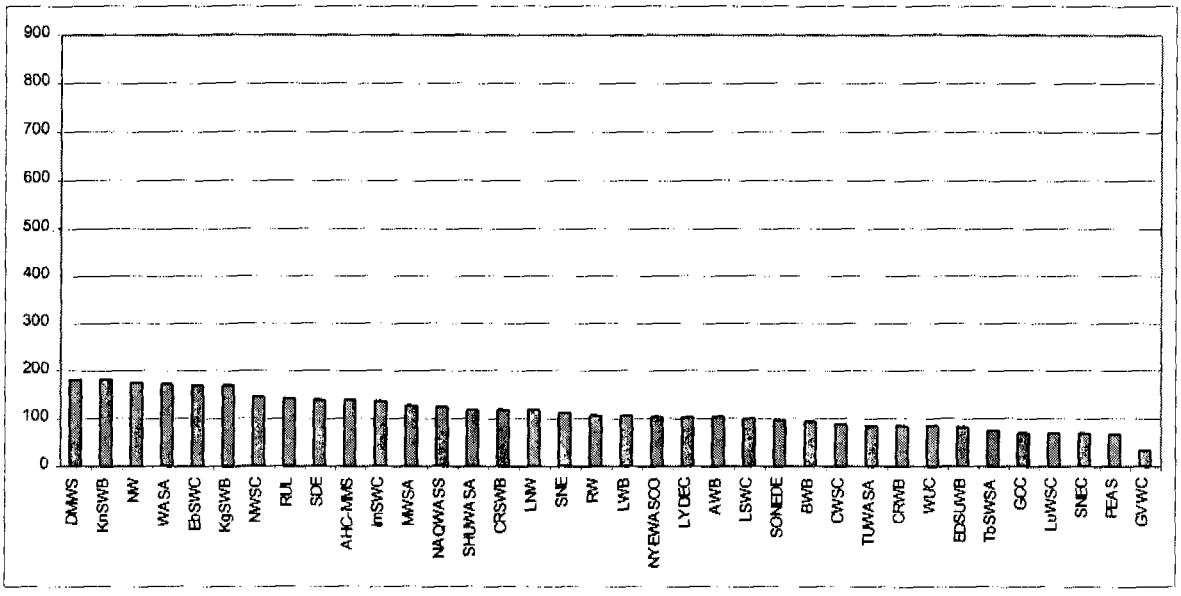
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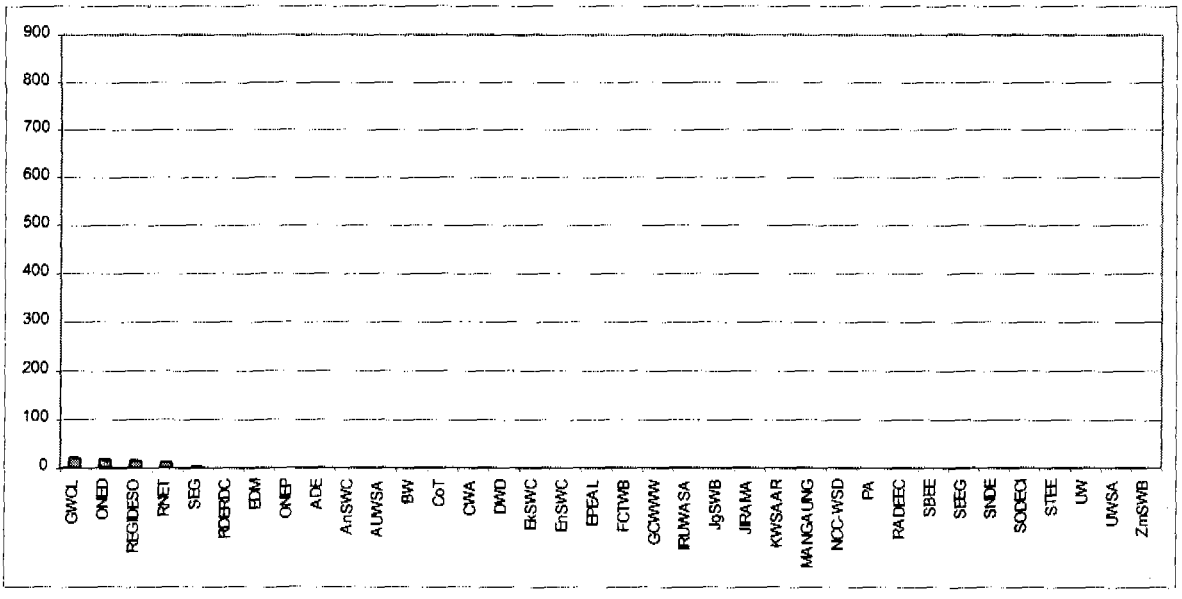
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3.38 210W: Strategic inventory

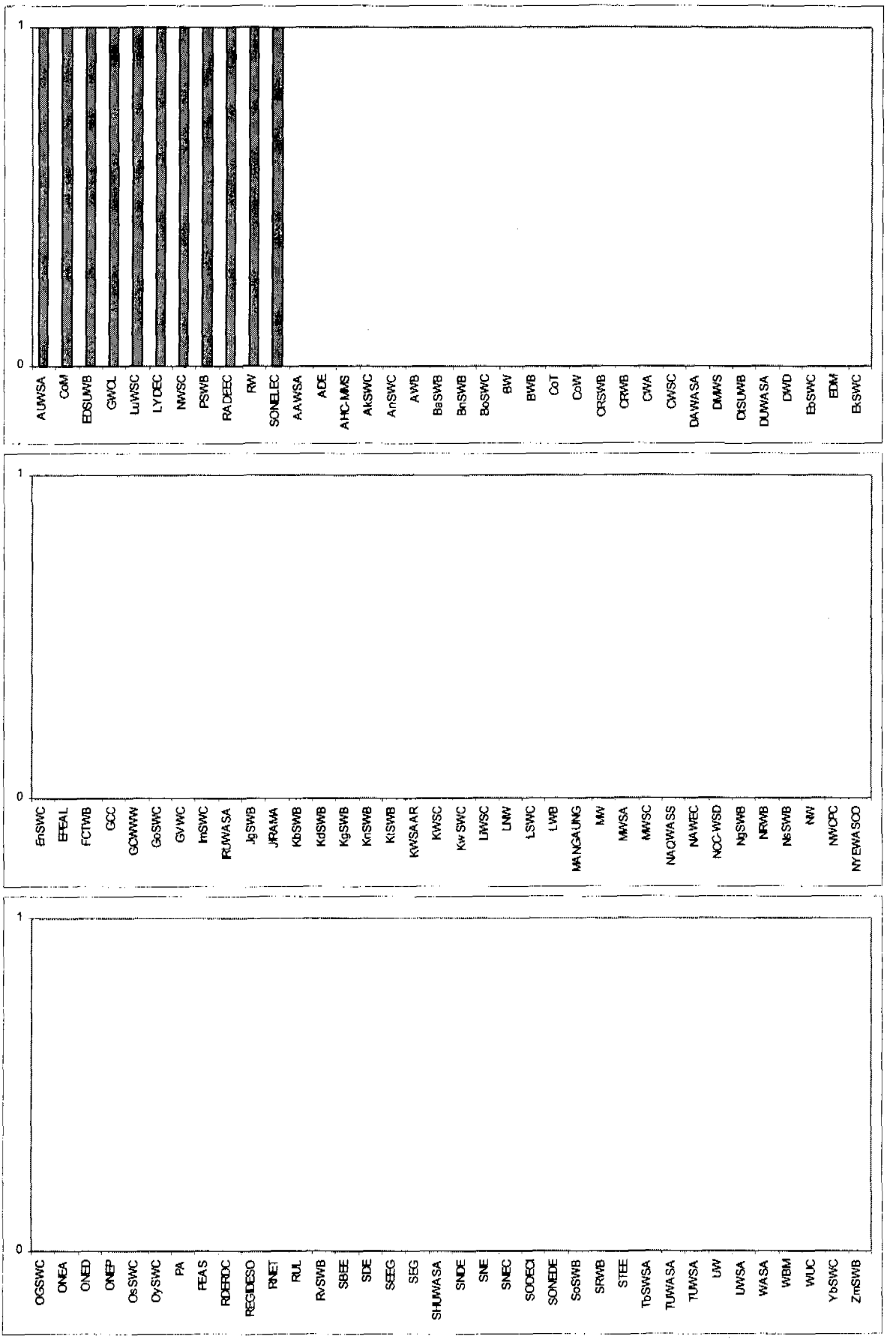
Included in the water-only questionnaire (Y/N)?	**N**

The indicator is simply a Yes/No indicator.

This indicator identifies those utilities which categorise inventory as strategic and non-strategic. Strategic inventory is that which is essential to the operation of the business, for example key spares, which would not otherwise be readily available.

In the graph, 1 means "yes" and 0 means "no".

11 utilities indicate that they do categorise inventory as strategic and non-strategic. The remaining 18 utilities to supply a full questionnaire either responded negatively or did not respond. This indicator does not provide any information about which types of inventory are categorised as strategic or non-strategic, nor what the inventory policies actually are.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4. ANALYSIS OF PERFORMANCE INDICATORS – SANITATION

4.1 55S: Percentage population served

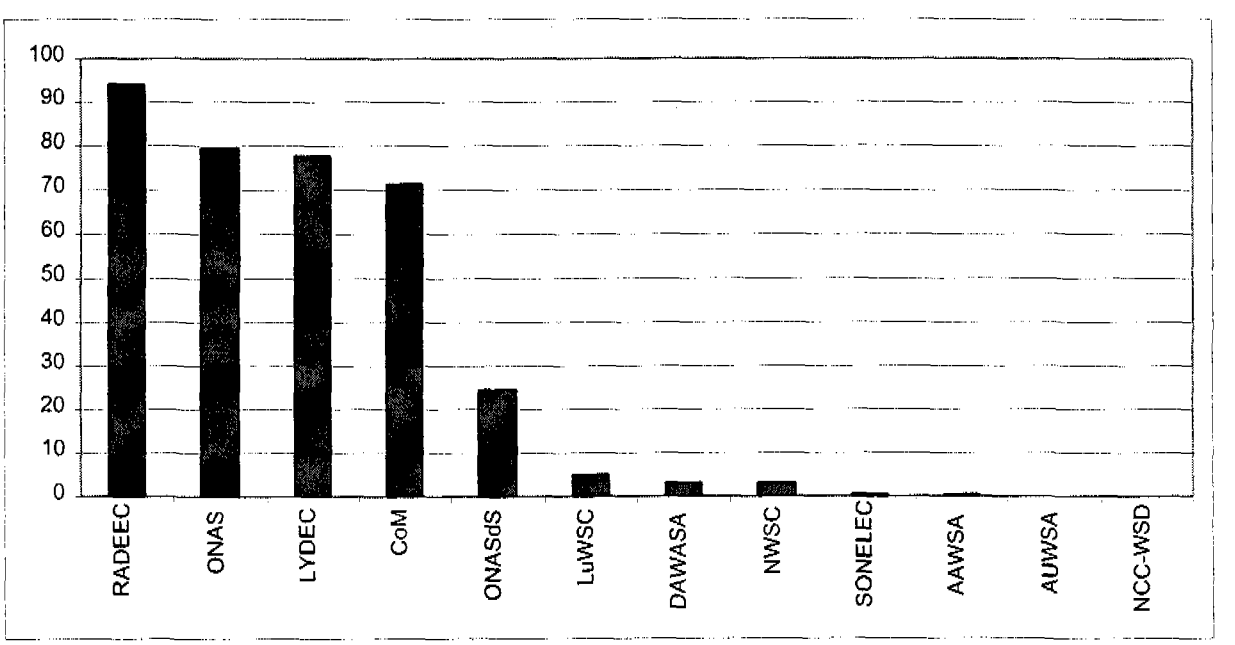
The indicator is calculated as:

$$\frac{\text{Total no. of persons served}}{\text{Total no. of persons in area of operations}} * 100$$

This indicator represents a measure of the service coverage of the utility. The greater the service coverage, the greater is the utility's service to the local community in providing sanitation services. Supplementary services such as tankered services are covered in indicator 56S. The indicator measures extent of service but does not measure quality of service (refer indicator 96S which indicates the percentage sewage treated to at least primary standard). The total number of persons served includes army barracks, police camps, dormitories and hostels, but does not include tourists or visitors who are not part of the resident population.

Utilities should aim for at least 90% service coverage, but clearly the higher the service coverage, the better. Only 1 utility achieved this value. Two utilities (on the right side of the graph) either did not provide data or entered zero. Note that, as described in Section 2, only the 12 utilities which submitted sanitation data are included on the graph.

It is anticipated that if a utility only serves the more affluent section of its area, it may have a low service coverage indicator but it also may appear to perform well in the financial indicators such as debtor days and collection efficiency.



4.2 56S: Tankered or other supply services to population not directly covered

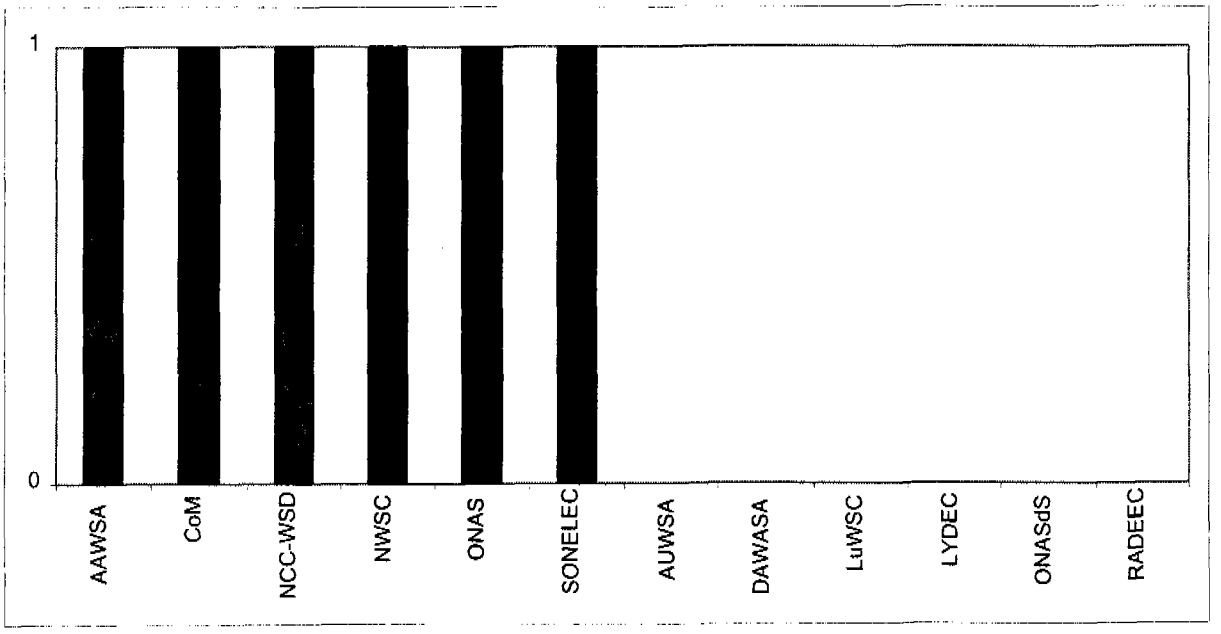
The indicator is simply a Yes/No indicator.

This indicator represents a measure of the service coverage of the utility. Utilities which do not provide direct services to all the resident population may deliver a tankered service to those people not directly served. This indicator seeks to identify such utilities. This indicator should be viewed in relation to 55S so that the two indicators together represent the service coverage of the utility.

Utilities which have a significant population which is not directly served should aim to provide at least a tankered service to such people. Some areas have independent or intermediate suppliers, which need to be monitored and subject to quality control.

In the graph, 1 means "yes" and 0 means "no".

Half of utilities confirm that they do deliver a tankered service to those people not directly served. The remainder either do not provide such services or have not responded to the question.



4.3 63S: Percentage increase in domestic connections over the year

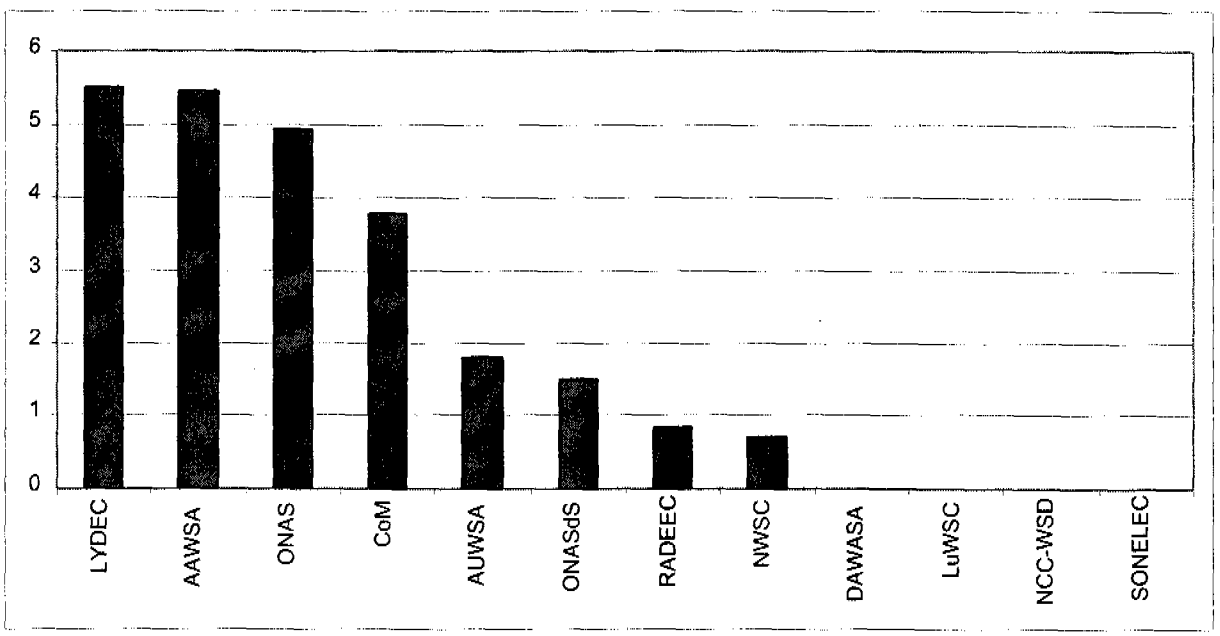
The indicator is calculated as:

$$\frac{\text{No. of new domestic connections during last year}}{\text{No. of domestic connections at start of year}} * 100$$

This indicator represents a measure of the rate of expansion of the system. The greater the value of this indicator, the greater the expansion of the system over the year. Where utilities have a poor existing service coverage (refer indicators 55S and 56S), this indicator will pick up the degree to which the utility is addressing this issue.

For utilities with already high service coverage, it is expected that this indicator will be low since the only expansion opportunities will be through growth in population.

8 of the 12 utilities supplied data for this indicator – the remainder either reported a zero figure or did not supply data. The growth rates are all fairly modest, in the range 0.5 to 6 percent per year, particularly since there appears to be significant scope to expand (see indicator 55S).



4.4 71S: Reduced or delayed connection charges to low income households

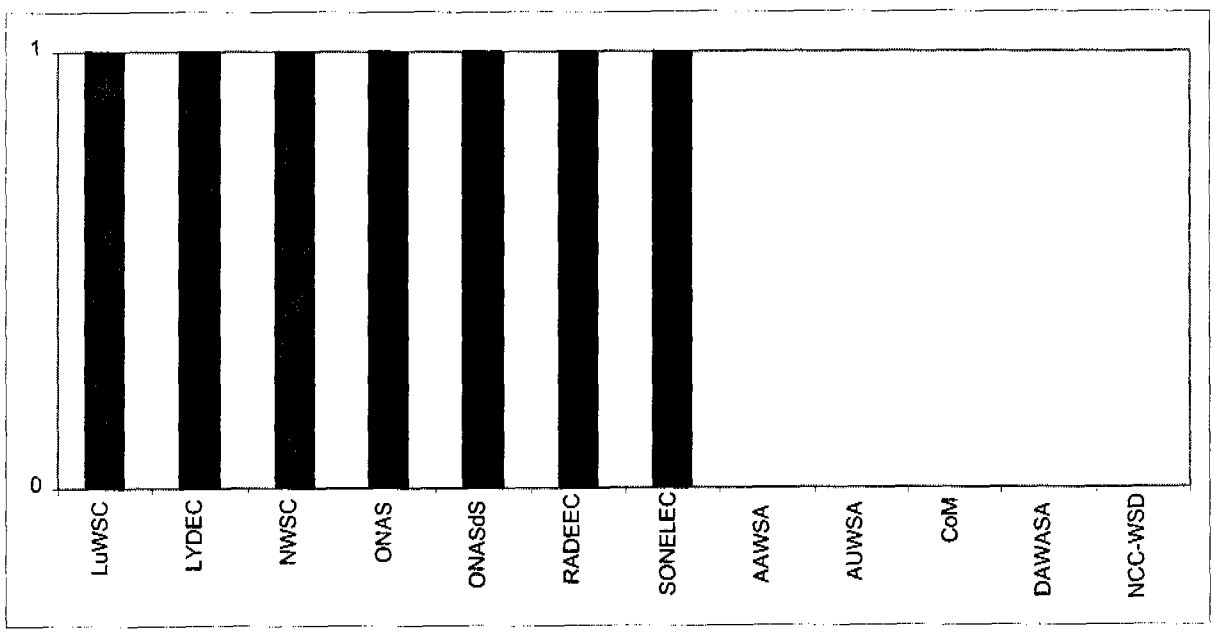
The indicator is simply a Yes/No indicator.

This indicator represents a measure of an aspect of customer service by the utility. Utilities which provide reduced or delayed connection charges to low income households take seriously the need for system expansion in the community and, moreover, are prepared to offer incentives to poorer members of the community to connect to the network.

Clearly this indicator does not assess the extent or effectiveness of the policy of reduced or delayed connection charges to low income households. Such policies may vary greatly in scope and in the level of incentive offered.

In the graph, 1 means "yes" and 0 means "no".

Over half of utilities offer reduced or delayed connection charges to low income households. The remainder either do not offer such charges or have not responded to the question.



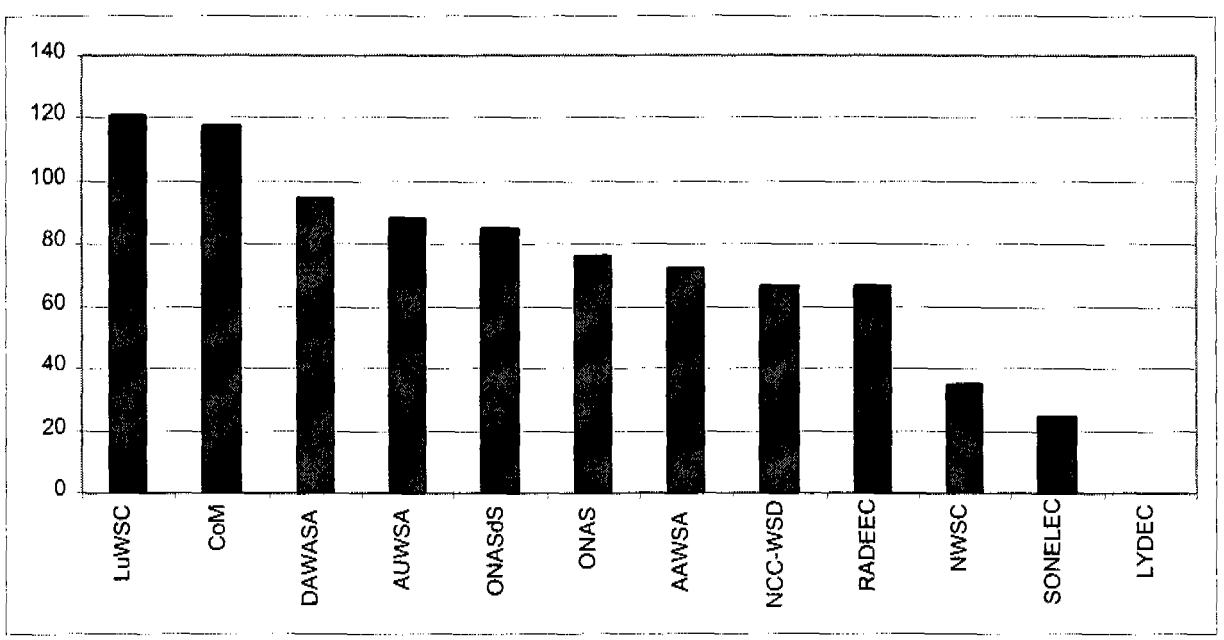
4.5 85S: Percentage treatment capacity utilised

The indicator is calculated as:

$$\frac{\text{Average daily volume of sewage treated (cu.m/day)}}{\text{Total design capacity of all treatment works (cu.m/day)}} * 100$$

This indicator is intended to identify the level of spare capacity within the system based on current demand, to identify those utilities where there are particular capacity constraints and where such constraints might be anticipated in the future based on demand growth pressures. Such constraints may focus efforts on levels of infiltration to sewers and water conservation efforts (refer indicator 78W). This indicator should therefore be viewed alongside water conservation and water demand indicators. Note that the measure is based on treatment capacity rather than network capacity, which would be more difficult to measure.

11 utilities provided data for this indicator – only one utility either reported a zero figure or did not supply data. Three utilities report that the percentage treatment capacity utilised is either greater than or close to 100%. Capacity utilisation of over 100% is clearly unsustainable in the longer term and effort should be made to reduce demand or infiltration (if this is a problem) before funding is sought for capacity extensions.

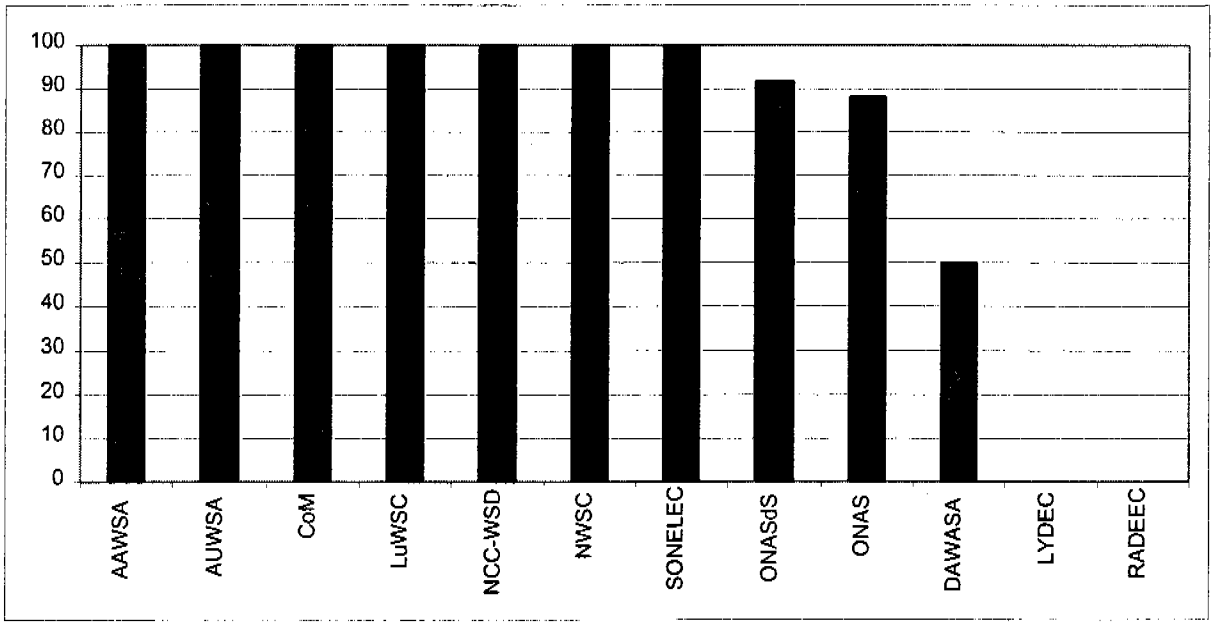


4.6 96S: Percentage sewage treated to at least primary standard

The indicator is input directly by the user.

This indicator is a measure of the quality of final effluent discharged to the environment. It is defined as the percentage of sewage collected by volume which is treated to at least primary standard. Such treatment must include settlement to separate solids but does not have to include biological treatment.

10 utilities supplied data for this indicator – the remaining two either reported a zero figure or did not supply data. Out of the 10 utilities, 7 report that 100% of sewage collected is treated to at least primary standard. Clearly, 100% should be the ultimate target for this indicator but this may not be achievable in practice for all utilities.



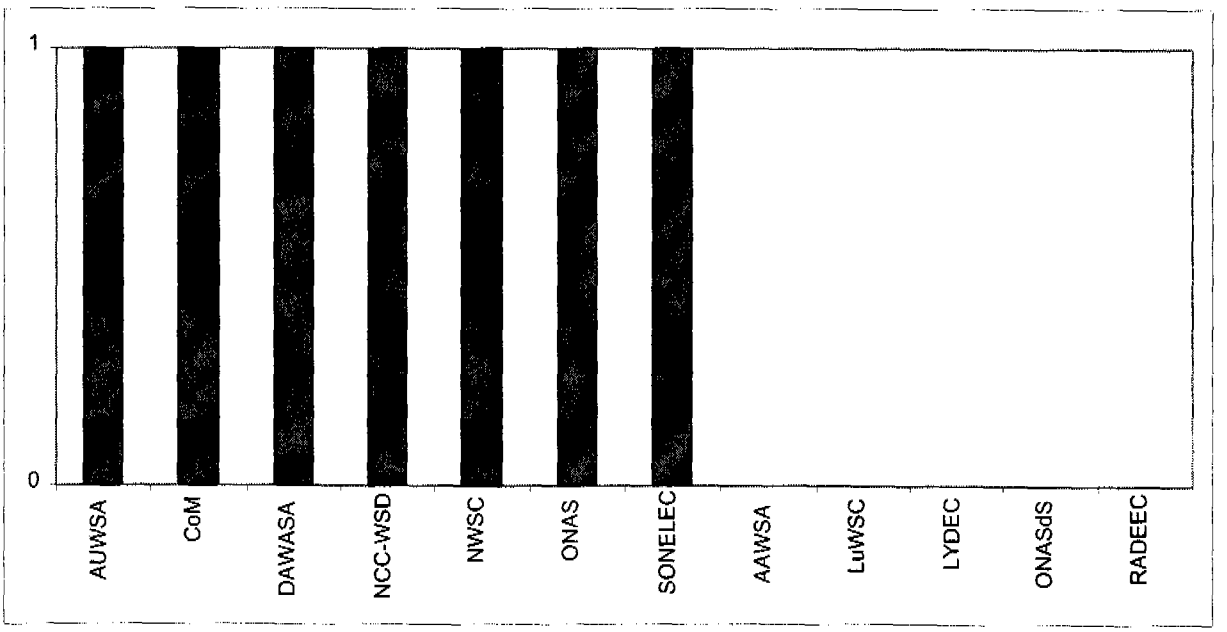
4.7 101S: Public health education

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities actively promote public health education. It is important that the public are aware of the dangers of waterborne diseases, the impact of proper sanitation on health and know how to minimise the risk of contracting these diseases.

In the graph, 1 means "yes" and 0 means "no".

7 utilities indicate that they do actively promote public health education. The remainder either responded negatively or did not respond.



4.8 124S: Percentage planned and unplanned maintenance

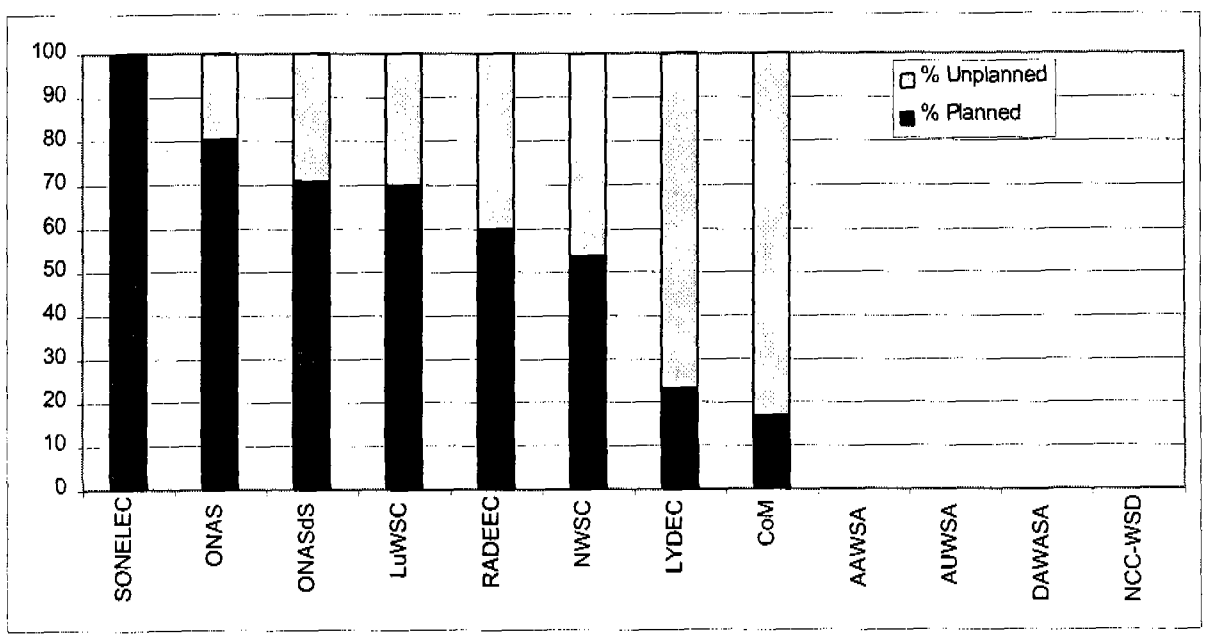
The indicator is calculated as the percentage split between planned and unplanned maintenance, based on the planned and unplanned maintenance costs reported for the year.

Planned maintenance cost is defined as all costs associated with maintenance programmes and normal maintenance routines, basically all scheduled maintenance. Unplanned maintenance cost is defined as all maintenance expenditure associated with emergency repairs, breakdowns and all non-planned maintenance.

This indicator is a measure of the degree to which the utilities' assets are being pro-actively managed. It is a leading indicator of the level of service to customers, i.e. poor performance in this indicator means that, if sustained over a period of time, assets will deteriorate leading to reduced service levels to customers.

8 utilities supplied data for this indicator. Responses range from 100% down to 17% planned maintenance. It is for each utility to determine its own optimal level of maintenance (similar to the economic level of leakage) since too little maintenance leads to deteriorating asset condition and service levels whilst too much maintenance is clearly prohibitively expensive. This optimum level will be determined by various factors including asset stock, age and condition of assets, cost of maintenance and environmental factors such as climate.

This indicator should be viewed alongside other maintenance information, such as 128S, since a utility may report a high percentage planned maintenance but the overall level of maintenance undertaken may be relatively low.



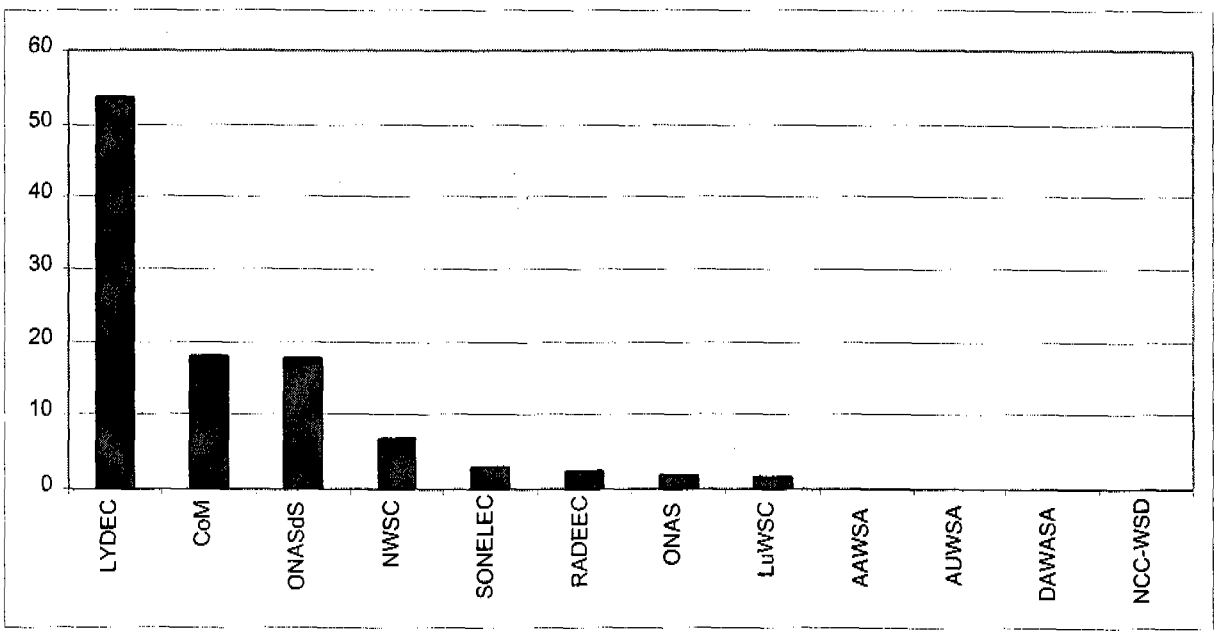
4.9 128S: Maintenance costs as a % of total operating costs

The indicator is calculated as:

$$\frac{\text{Total maintenance costs}}{\text{Total operating and maintenance costs}} * 100$$

This indicator is a measure of the relative level of maintenance costs in comparison with total operating costs. A high percentage is likely to indicate a high level of maintenance but it is possible that the reason could also be a relatively low denominator (total operating and maintenance costs). This indicator should therefore be viewed alongside 124S and operating cost data available from the database.

8 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. As described in 124S, the optimum level of maintenance depends on many factors, mostly specific to each utility, and cannot be determined as an absolute value.



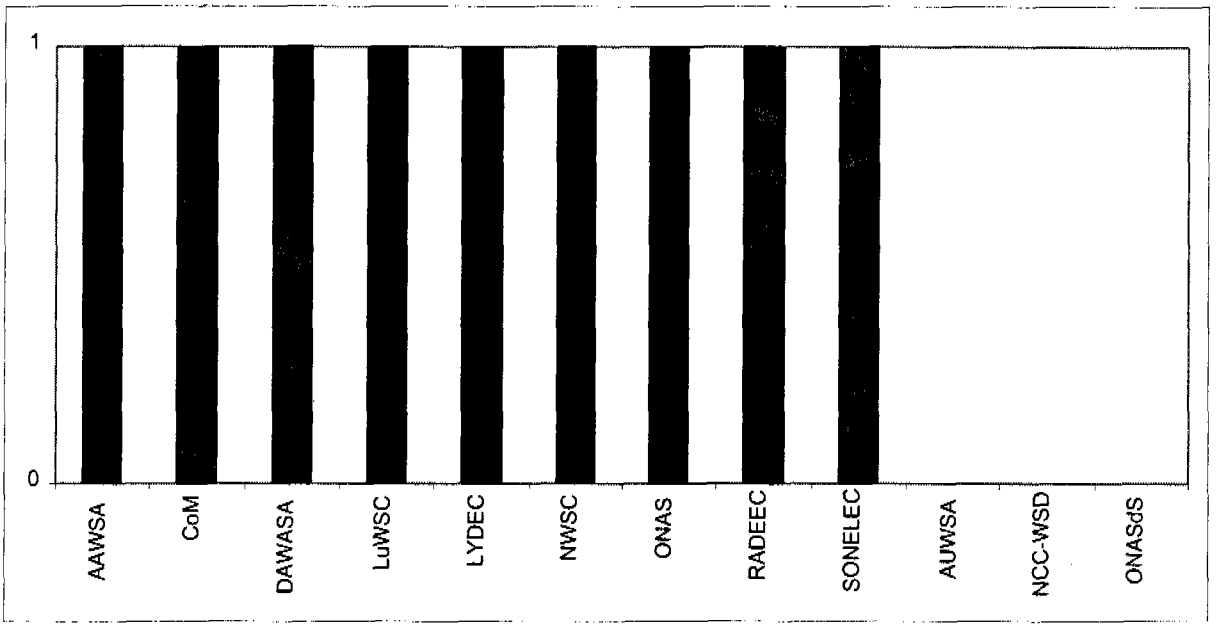
4.10 130S: Recording of customer complaints

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities routinely maintain a record of customer complaints received. A utility which maintains such a record is able to respond to customer needs and can demonstrate that it takes customer service seriously. This indicator should be viewed alongside other customer services indicators and information available on the database.

In the graph, 1 means "yes" and 0 means "no".

9 utilities indicate that they do routinely maintain a record of customer complaints received. The remainder either responded negatively or did not respond. Clearly the indicator does not provide any information about the extent or depth of the information recorded nor any actions resulting from the complaint.



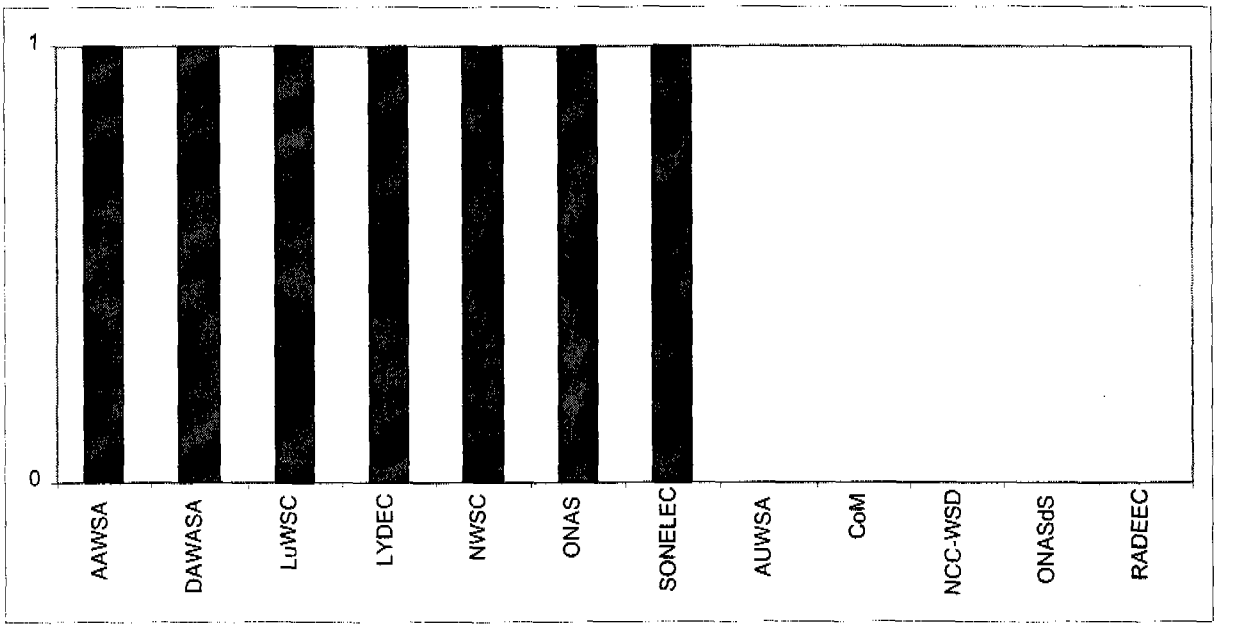
4.11 136S: Customer surveys

The indicator is simply a Yes/No indicator.

This indicator identifies whether or not utilities conduct customer surveys to identify customer needs and demands. A utility which undertakes such surveys can demonstrate that it takes seriously the views and requirements of its customers. It is also a good way to canvass opinion about particular issues and can form part of evidence to regulators to help justify improvement investment. This indicator should be viewed alongside other customer services indicators and information available on the database.

In the graph, 1 means "yes" and 0 means "no".

7 utilities indicate that they do conduct customer surveys to identify customer needs and demands. The remainder either responded negatively or did not respond. The indicator does not provide any information about the content or scope of the customer surveys nor any information about how the surveys are used in decision making.



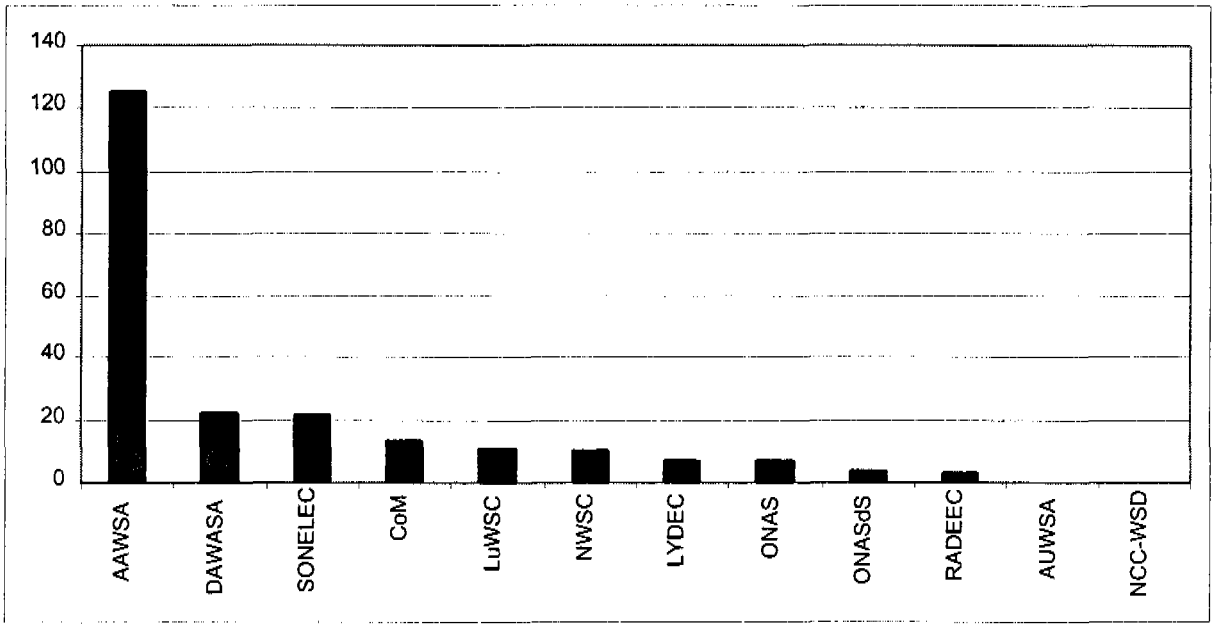
4.12 147S: Staff per 1000 connections

The indicator is calculated as:

$$\frac{\text{Total no. of staff}}{\text{Total no. of connections at year end}} * 1{,}000$$

This indicator is a measure of overall staffing levels. Particular care needs to be taken over small utilities since these may lack the critical mass and economies of scale of larger organisations and may therefore appear relatively over-staffed.

10 utilities provided data for this indicator. The remaining two utilities either did not provide data or entered zero. Values range from one utility with 120 staff per 1,000 connections down to the lowest four values which are all under 7 staff per 1,000 connections. Clearly, utilities with lower staff:connections ratios can be considered to be more efficient but, equally, a utility should not be under-staffed such that public health and the environment are put at risk.



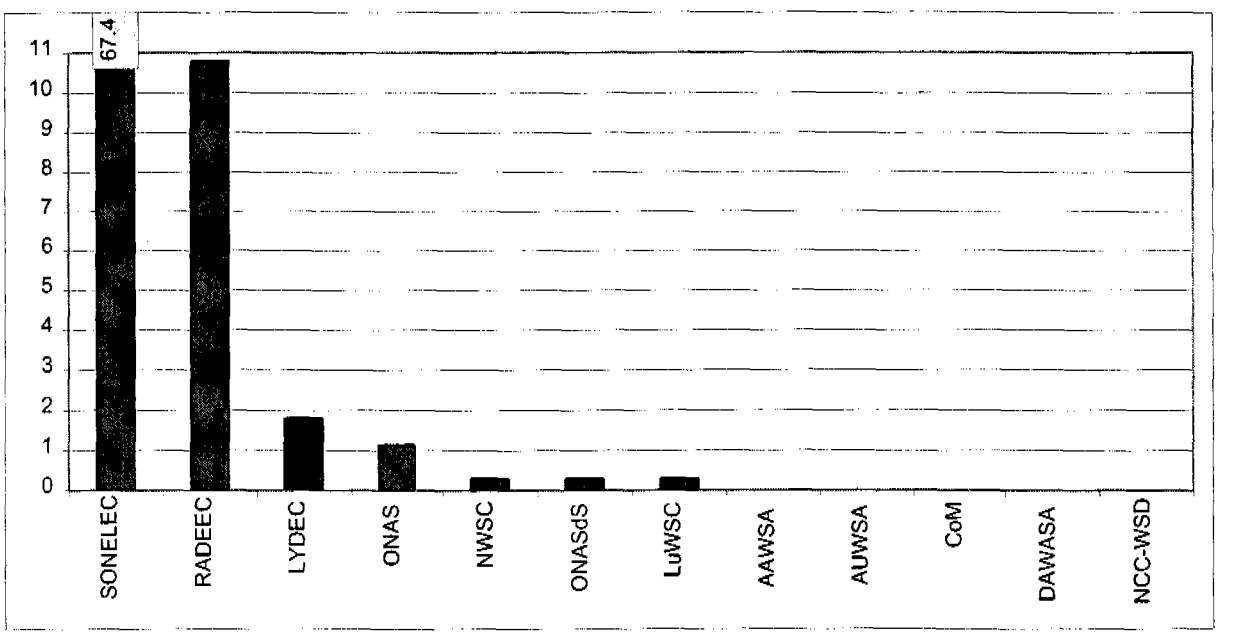
4.13 152S: Training cost as a % of total payroll

The indicator is calculated as:

$$\frac{\text{Total training costs in year}}{\text{Total payroll in year}} * 100$$

This indicator is a measure of the level of training undertaken by a utility. Properly trained and skilled staff are essential for the prudent running of a water utility and under-investment in training can lead to public health, environmental and health and safety problems. Only costs borne by the utility are included – costs borne by government or other organisations are excluded.

7 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Since the highest value (67.4%) is far in excess of the second highest value (10.8%), the scale on the graph has been limited and the highest value is made explicit. Five of the seven reported values are below 2%.



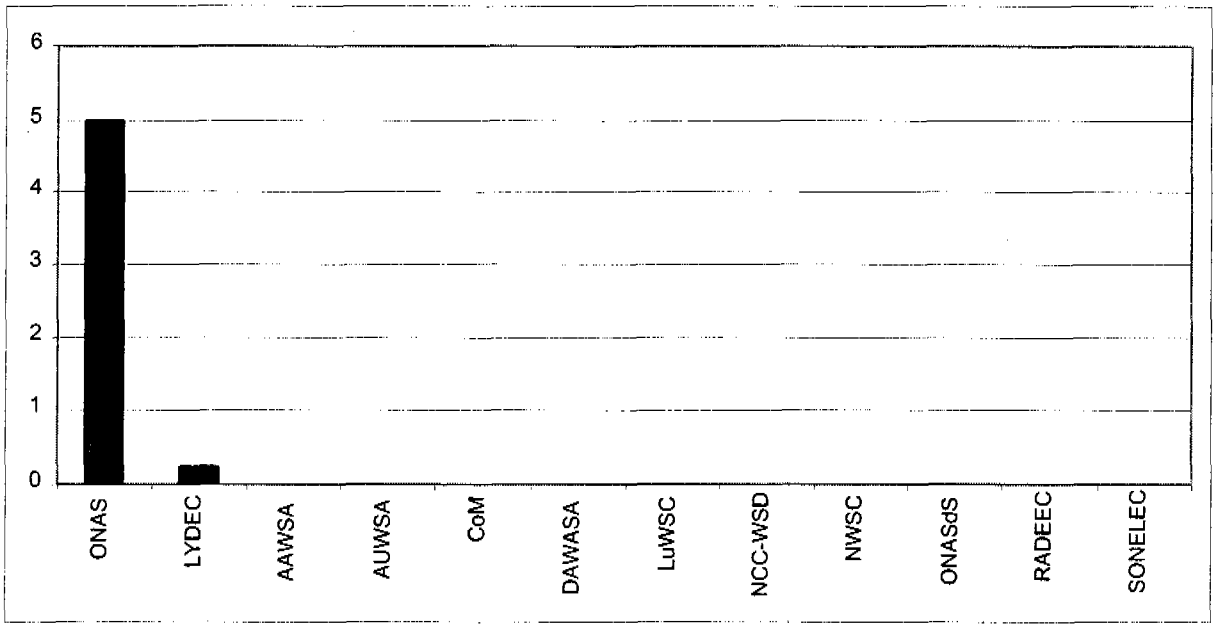
4.14 156S: Percentage lost days due to accidents

The indicator is calculated as:

$$\frac{\text{Total days lost due to accidents in year}}{\text{Total days worked in year}} * 100$$

This indicator is a measure of the health and safety record of the utility. Utilities should clearly be aiming for a low accident rate and this can be achieved through proper training and supervision. Only days lost due to injury at work are included – sick leave, compassionate leave and annual leave are excluded. The total days worked in the year is the total for all staff, i.e. the average days worked per year per staff member multiplied by the number of staff.

Two utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Very little can be concluded from only two data points.



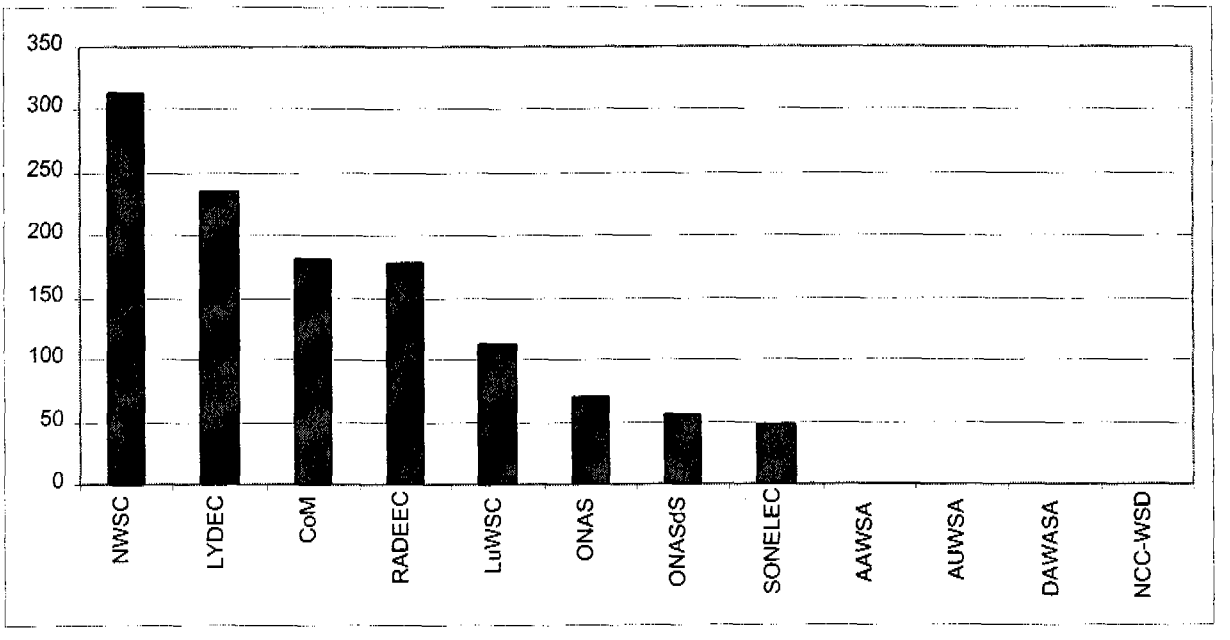
4.15 166S: Tariff cost recovery

The indicator is calculated as:

$$\frac{\text{Total direct tariff revenue in year}}{\text{Total operating and maintenance costs in year}} * 100$$

This indicator measures the tariff cost recovery of the utility. This is a key measure of a utility's ability to cover its operating and maintenance costs (excluding interest and depreciation) from revenues, without reliance on external subsidies, and is generally perceived as an indication of a commercial approach to the provision of a public service. The aim is for utilities to score at least 100 which indicates that tariff revenues are just enough to cover operating and maintenance costs. This indicator should be viewed alongside the other revenue indicators to get an overall picture of a utility's performance in this area.

8 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. 5 utilities have a tariff cost recovery of over 100%, which means that the other three utilities providing data do not raise enough revenue to cover operating and maintenance costs. For the UK utilities, the tariff cost recovery values lie in the range 250 to 450. These values are large because, as well as covering operating and maintenance costs, the utilities are also currently funding large capital programmes for obligatory improvements.



4.16 170S: Revenue collection efficiency

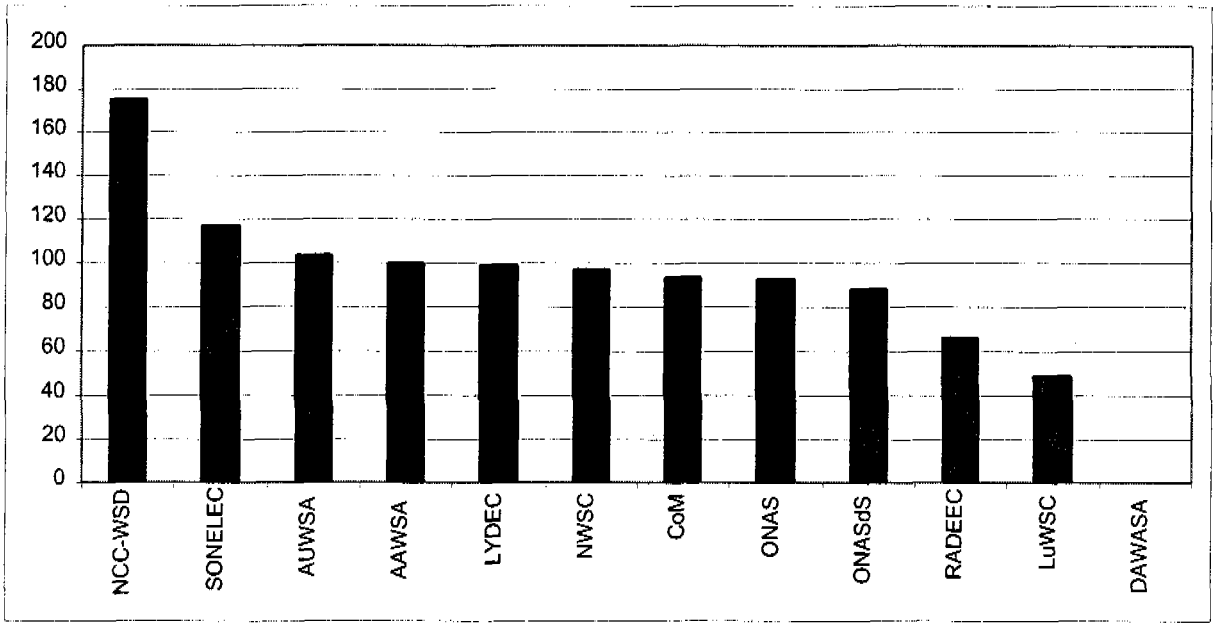
The indicator is calculated as:

$$\frac{\text{Total revenue collected in year}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator measures the revenue collection efficiency of the utility. This shows how much revenue has been collected compared with how much has been billed in the reporting year. It is clearly in the utilities' interests that the revenue collection efficiency should be maximised. It is possible to score greater than 100 for this indicator since revenue left uncollected from last year may be collected this year and added to the billed revenue this year. A more complex indicator would identify how much that should have been billed has actually been billed since significant discrepancies can often be uncovered here.

This indicator should be viewed in conjunction with the other revenue indicators. In particular, utilities which score well in this indicator would also be expected to perform well for 174S, average debtor days, which is an indicator of the level of customer debt outstanding.

All but one utility provided data for this indicator and all but two of these have scores of over 85, with the lowest score being 49. It should be the aim of all utilities to score as near to 100 as possible over a sustained period of time.



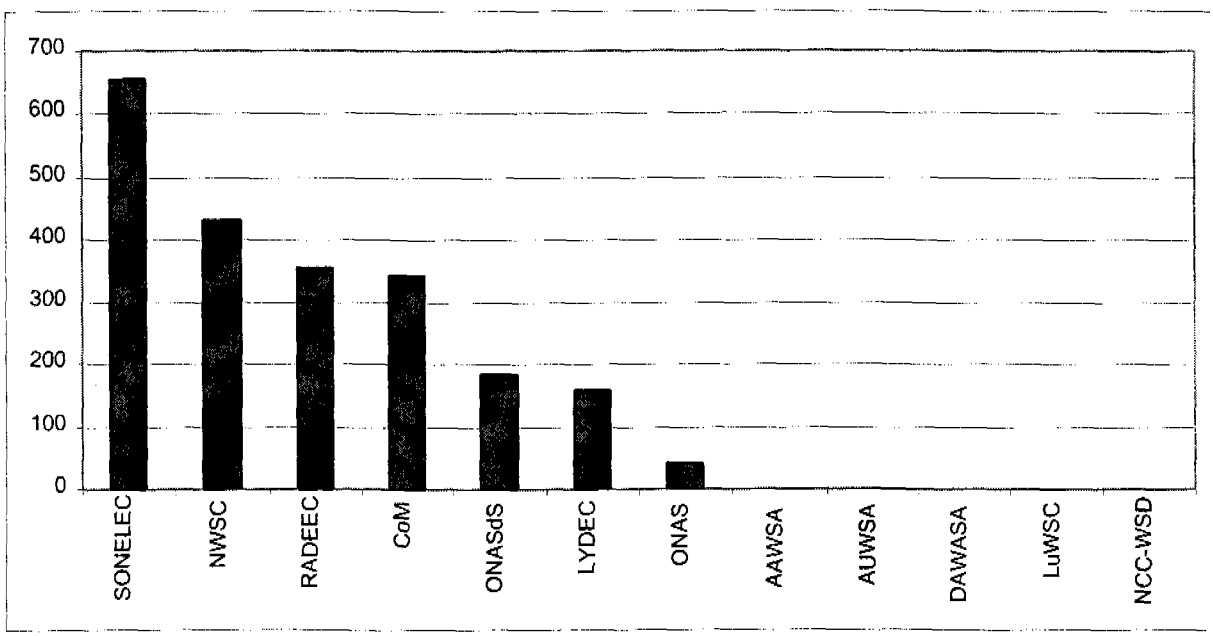
4.17 174S: Average debtor days

The indicator is calculated as:

$$\frac{\text{Accounts receivable at year end}}{\text{Total direct tariff revenue in year}} * 365$$

This indicator is a measure of the outstanding customer debt at year end. It is measured in terms of the number of days' worth of billings outstanding. It is clearly in the utilities' interests to minimise this number and this indicator should be viewed in conjunction with the other revenue indicators, in particular 170S on revenue collection efficiency.

7 utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. Apart from ONAS, the values reported are all over 150 days, which implies that there are considerable amounts of uncollected revenue.



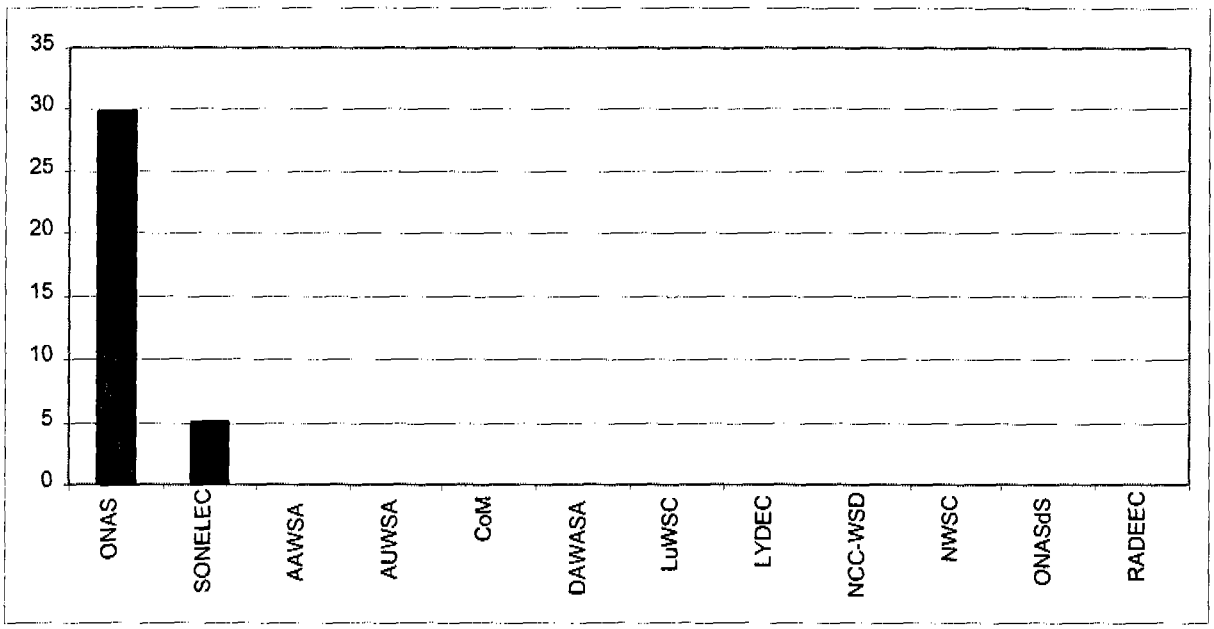
4.18 185S: Percentage revenue subsidy

The indicator is calculated as:

$$\frac{\text{Revenue subsidy received in year}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator calculates the revenue subsidy received in the year as a percentage of total direct tariff revenue. In most countries, revenue subsidies are in decline and are not perceived to be a sustainable basis for operation of the utility. It will therefore be informative to view this indicator over time, as more data is added to the database, to identify trends. Subsidies such as fuel subsidy, import duty subsidy, tax subsidies, capital subsidies, etc. are not included in the revenue subsidy. This indicator links to tariff cost recovery (166S) since it is likely that a utility is carrying a loss for the year if it has a tariff cost recovery of less than 100% and is not receiving a revenue subsidy.

Only two utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. The revenue subsidies reported lie in the range 5 to 30 percent of total direct tariff revenue.



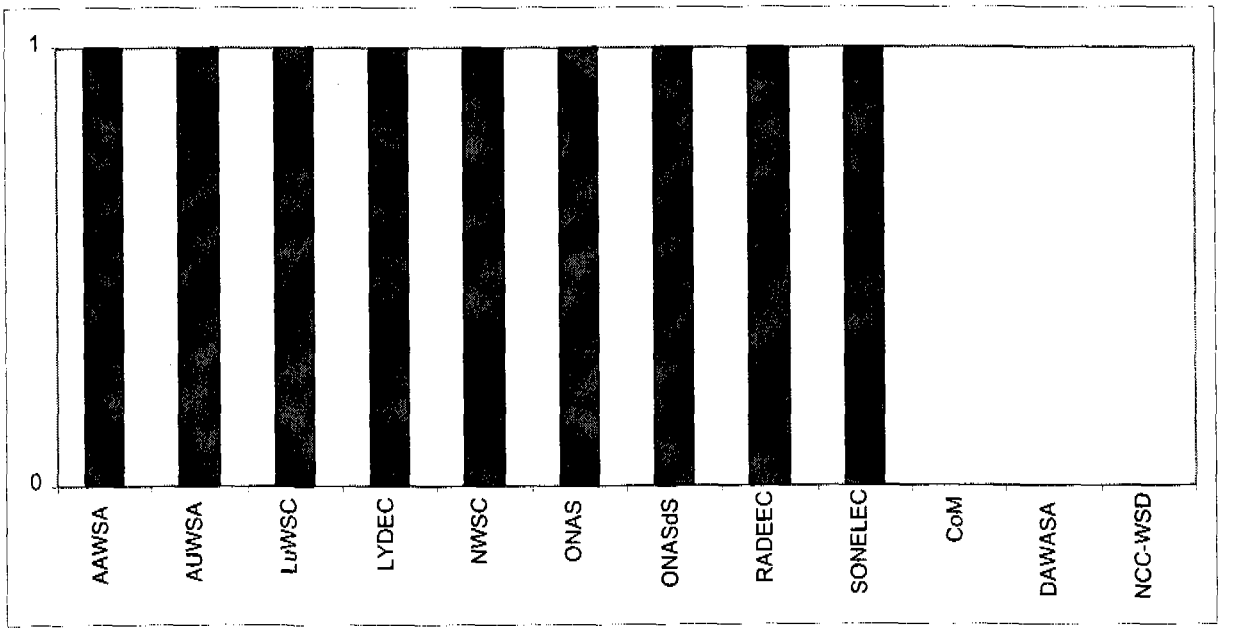
4.19 187S: Depreciation policy

The indicator is simply a Yes/No indicator.

This indicator identifies those utilities which operate a depreciation policy. This is a formal accounting system which charges the cost of asset ownership to its operations, i.e. the value of assets are written off as their useful life decreases. This is a prudent accounting policy to adopt.

In the graph, 1 means "yes" and 0 means "no".

9 utilities indicate that they do operate a depreciation policy. The remainder either responded negatively or did not respond. The indicator does not provide any details about the depreciation policy such as asset lives assumed for different types of asset (191S provides an indicator of this for pumps).



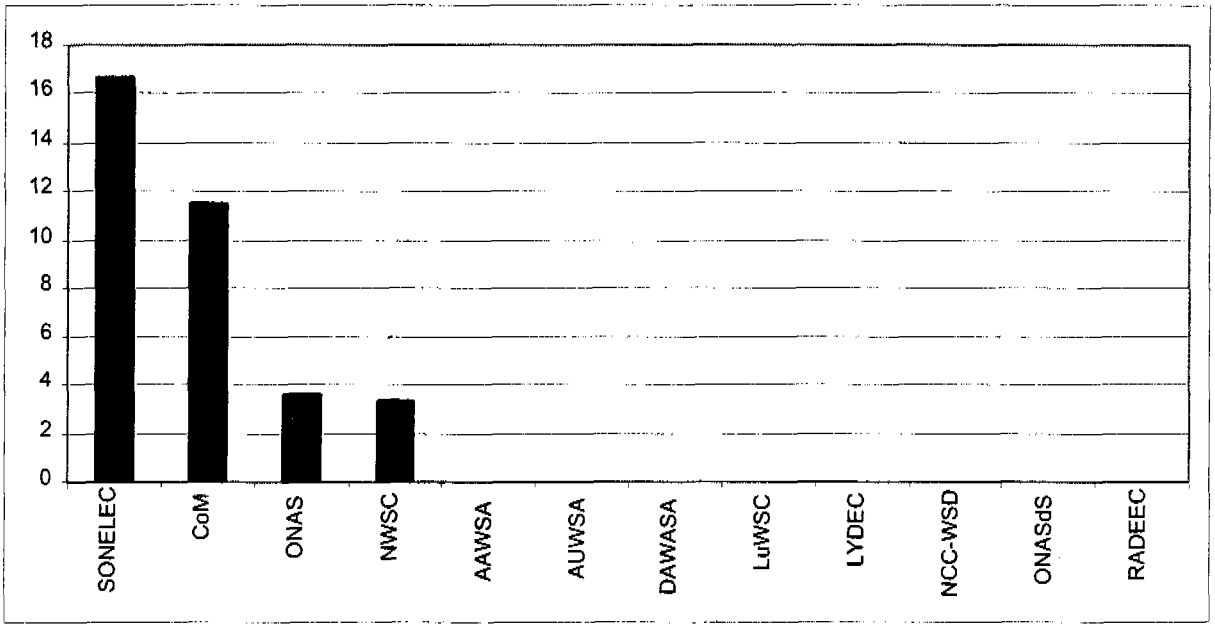
4.20 191S: Rate of capital replacement (% per year)

The indicator is calculated as:

$$\frac{\text{No. of pumps replaced in year}}{\text{Total no. of pumps at year end}} * 100$$

Capital assets may often last a long time but they do not last forever. Every utility needs not only to expand and develop its assets to meet new operating demands, but also to replace assets as they wear out. Obviously, the rate at which assets wear out will depend on how they have been maintained, and for every asset there is an optimal replacement time. As a readily available proxy measure of the overall rate of capital replacement, one element of capital assets has been taken - the rate of pump replacement.

Four utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. The rates of pump replacement reported vary from 17% down to 3%. This translates to asset lives of 6 years to 30 years if these replacement rates are maintained over the long term.



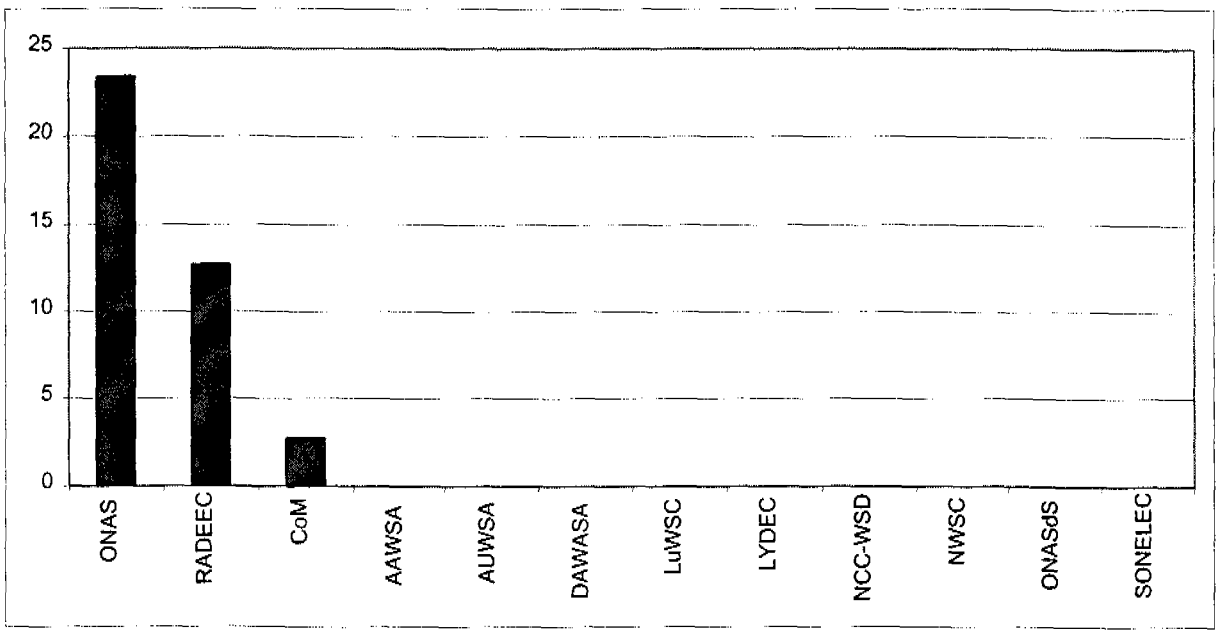
4.21 205S: Debt service ratio

The indicator is calculated as:

$$\frac{\text{Total annual debt service}}{\text{Total direct tariff revenue in year}} * 100$$

This indicator is a measure of a utility's ability to meet its debt service obligations from revenue earned. Revenue will not cover debt service obligations if the score exceeds 100. Annual debt service is the total amount of interest and principal paid during the reporting year, in respect of both long term and short term borrowings and overdrafts. This includes interest and principal which has been capitalised.

Three utilities provided data for this indicator. The remaining utilities either did not provide data or entered zero. All three utilities report a debt service ratio of well under 100, which means that revenue easily covers debt service obligations.



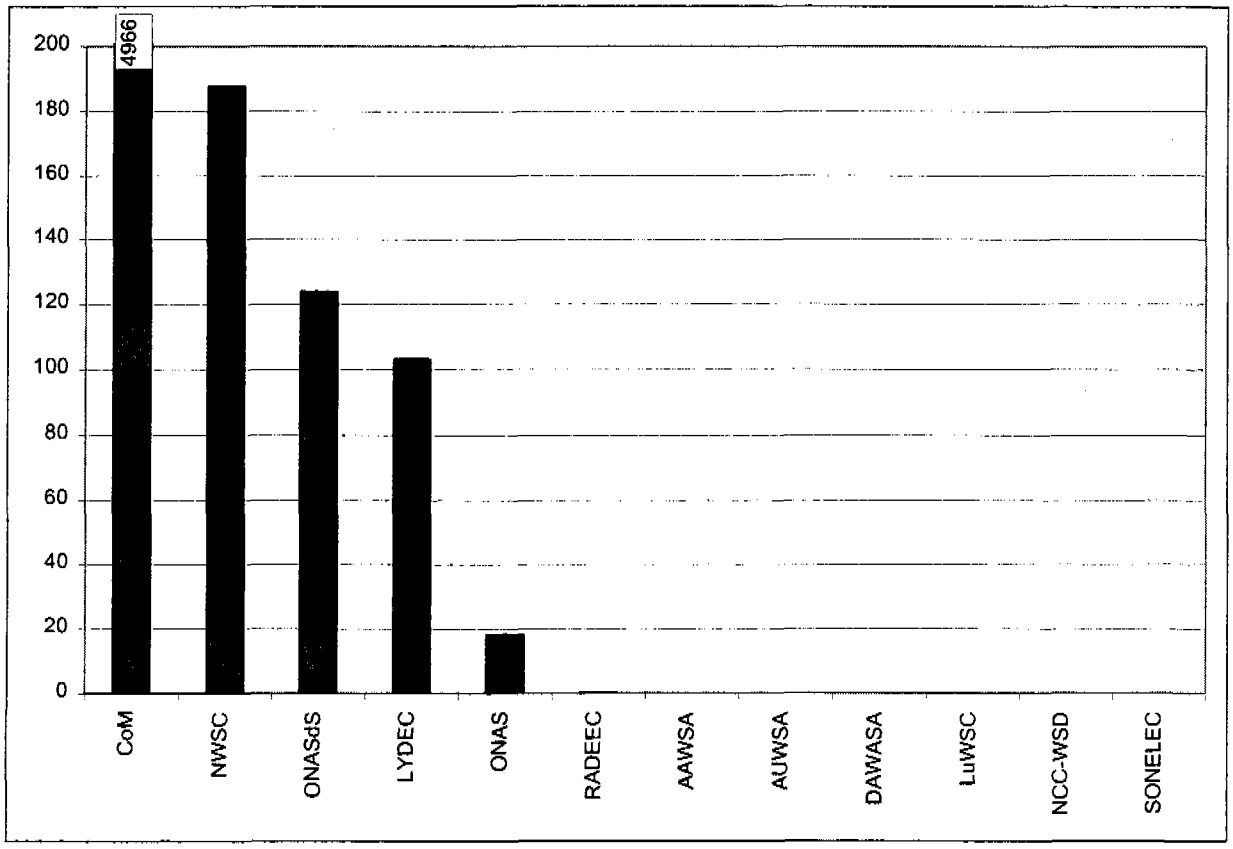
4.22 209S: Current liquidity ratio

The indicator is calculated as:

$$\frac{\text{Total current assets}}{\text{Total current liabilities}} * 100$$

This indicator is the current liquidity ratio, which measures a utility's ability to meet its current liabilities from its current assets, i.e. whether there are enough resources to hand to meet present financial commitments. The current assets and liabilities figures are available from the Balance Sheet. Current assets include cash, stock, debtors and other short-term assets. Current liabilities include overdrafts, short-term borrowings, money owed to suppliers (creditors) and any other short-term liabilities. This indicator should be viewed alongside other financial indicators, particularly the debt service ratio (205W). Utilities with scores under 100 have more liabilities than assets and are financially over-committed.

6 utilities provided data for this indicator. The remaining utilities (from AAWSA to the end of the graph) either did not provide data or entered zero. For the sake of greater clarity in the graph, the scale has been limited and so CoM's extreme value has been printed on the graph. Only two utilities, ONAS (20) and RADEEC (almost zero), have scores of under 100 and so have more liabilities than assets.



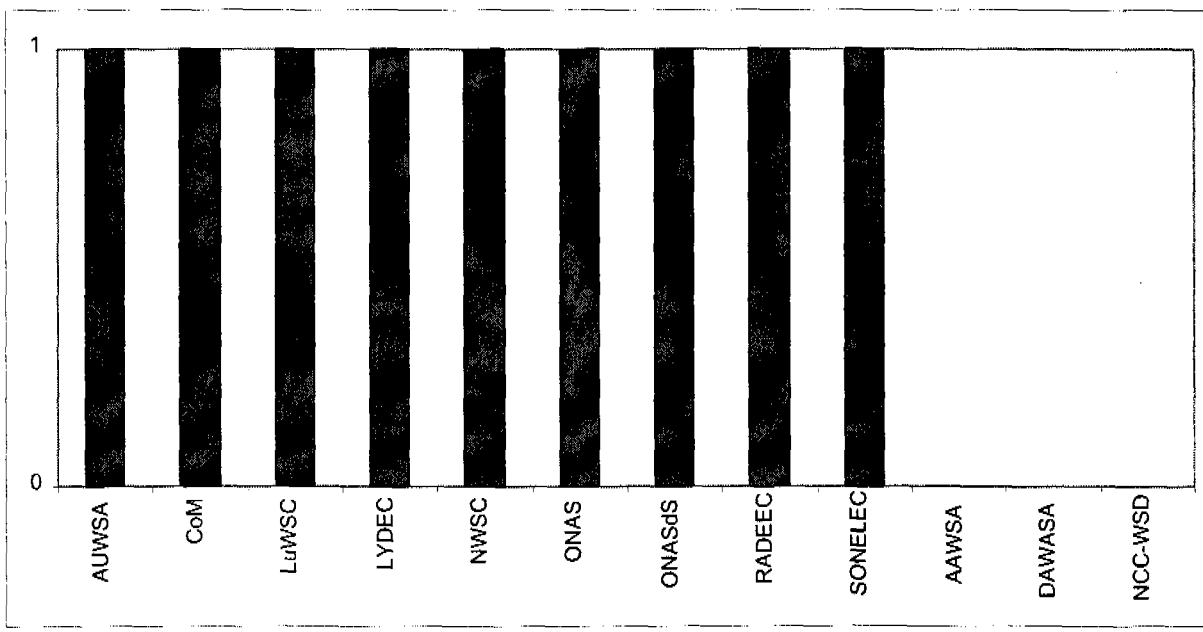
4.23 210S: Strategic inventory

The indicator is simply a Yes/No indicator.

This indicator identifies those utilities which categorise inventory as strategic and non-strategic. Strategic inventory is that which is essential to the operation of the business, for example key spares, which would not otherwise be readily available.

In the graph, 1 means "yes" and 0 means "no".

9 utilities indicate that they do categorise inventory as strategic and non-strategic. The remainder either responded negatively or did not respond.



5. KEY INDICATORS AND SUPPORTING DATA

This section contains a table of key indicators (section 5.1) and a table of supporting information (section 5.2). Whilst section 5.1 simply reproduces the information in sections 3 and 4 in a different format, it is useful to be able to see the key indicators together in one place. The key indicators have been chosen as those indicators that are particularly important in assessing a utility's relative performance. Section 5.2 provides supporting information to the performance indicators and includes background information (such as which functions a utility performs, type of ownership, etc.) as well as key data (such as population served, staff numbers, etc.). All of this information is available on the database.

Where data supplied has been considered to be outside the normal range of feasible values, i.e. are outliers, these data points have been deleted and left blank. As described in Section 2, zeros are either genuine zero values or are null entries, i.e. data not supplied. For the yes/no questions, 1 means yes and 0 means no.

5.1 Key indicators

	AAWSA	ADE	AHC-MMS	AkSWC	AnSWC	AUWSA	AWB
55W: % population served	95.1	90.5	97.0	6.4	100.7	90.0	0.0
77W: Per capita consumption (l/h/d)	0.1	76.3	0.0	222.6	6.3	78.3	0.0
90W: % unaccounted for water	30.0	0.0	59.5	50.0	72.1	38.9	6.5
92W: Availability of supply (hrs/day)	24.0	12.0	14.0	6.0	8.0	20.0	24.0
100W: % samples failing water quality	0.0	0.0	1.0	10.0	0.0	0.0	2.0
147W: Staff per 1000 connections	8.2	8.7	13.8	112.0	0.0	13.7	0.0
166W: Tariff cost recovery	45.3	81.5	97.1	85.2		87.2	87.0
174W: Average debtor days	39.8	746.4	0.0	0.0	0.0	0.0	0.0
205W: Debt service ratio	2.9	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	187.2	0.0	140.1	1063.6	0.0	0.0	101.9
55S: % population served	0.4	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	100.0	0.0	0.0	0.0	0.0	100.0	0.0
147S: Staff per 1000 connections	125.2	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	BaSWB	BnSWB	BoSWC	BW	BWB	CoM	CoT	CoW
55W: % population served	66.3	30.0	47.5	100.0	75.0	86.9	98.9	99.8
77W: Per capita consumption (l/h/d)	108.8	95.2	52.3	98.6	0.1	103.3	100.7	120.3
90W: % unaccounted for water	45.0	37.8	30.0	50.0	37.9	57.6	18.2	19.8
92W: Availability of supply (hrs/day)	18.0	15.0	5.0	24.0	24.0	24.0	23.9	24.0
100W: % samples failing water quality	5.4	0.0	5.0		0.0	0.0	0.0	
147W: Staff per 1000 connections		44.1	21.3	6.4	17.7	5.4	0.9	2.0
166W: Tariff cost recovery	20.4	173.7	11.0	127.8	168.5	113.6	108.6	96.3
174W: Average debtor days	0.0	0.0	0.0	0.0	0.0	279.7	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	65.8	0.0	0.0
209W: Current liquidity ratio	247.8	2794.2	734.8	0.0	93.1	480.0	0.0	624.0
55S: % population served	0.0	0.0	0.0	0.0	0.0	71.4	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	13.6	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	181.2	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	343.1	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	4965.5	0.0	0.0

	CRSWB	CRWB	CWA	CWSC	DAWASA	DMWS	DtSUWB
55W: % population served	100.0	29.2	103.6	87.1	67.3	94.0	29.3
77W: Per capita consumption (l/h/d)	12.5	53.3	3.7	115.0	29.3	158.0	265.1
90W: % unaccounted for water	42.6	15.6	43.2	40.1	34.8	20.0	40.0
92W: Availability of supply (hrs/day)	7.0	0.0	18.0	24.0	14.0	24.0	16.0
100W: % samples failing water quality	0.0	0.0	1.5	23.0	20.0	0.0	0.0
147W: Staff per 1000 connections	38.9	15.4	4.0	15.6	13.4	3.2	26.0
166W: Tariff cost recovery	17.6	66.9	181.6	78.4	96.2	80.0	13.3
174W: Average debtor days	0.0	0.0	0.0	0.0	176.8	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	117.5	85.3	0.0	88.9	264.5	183.3	527.5
55S: % population served	0.0	0.0	0.0	0.0	3.3	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	50.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	22.5	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	DUWASA	DWD	EbSWC	EDM	EDSUWB	EkSWC	EnSWC
55W: % population served	51.1	17.0	12.2	48.2	30.8		51.2
77W: Per capita consumption (l/h/d)	194.5	0.0	19.3	103.0	156.6	33.8	43.9
90W: % unaccounted for water	42.2	30.0	49.9	33.2	47.5	30.0	0.0
92W: Availability of supply (hrs/day)	12.0	0.0	6.0	24.0	8.0	0.0	0.0
100W: % samples failing water quality	0.0	0.0	0.0	0.0	1.0	0.0	0.0
147W: Staff per 1000 connections	18.9		34.6	3.5	10.4	99.3	0.0
166W: Tariff cost recovery	28.6	1.7	64.6	92.2	59.2	6.9	0.0
174W: Average debtor days	0.0	0.0	0.0		113.0	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0		0.0	0.0	0.0
209W: Current liquidity ratio	7000.0	0.0	170.4	0.9	82.1	0.0	0.0
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	EPEAL	FCTWB	GCC	GCWWW	GoSWC	GVWC	GWCL
55W: % population served	85.0	87.4	97.5	115.4	5.4	10.1	83.9
77W: Per capita consumption (l/h/d)	67.8	109.1	137.4	256.0		0.0	19.8
90W: % unaccounted for water	0.0	22.6	35.0		10.3	15.9	51.4
92W: Availability of supply (hrs/day)	12.0	24.0	24.0	24.0	18.0	14.5	0.0
100W: % samples failing water quality	5.0	0.0	1.0	0.0	0.0	0.0	0.0
147W: Staff per 1000 connections	11.2	8.8	4.0	58.7		27.5	17.1
166W: Tariff cost recovery	89.9	97.6	76.7	0.0	12.7	399.5	16.4
174W: Average debtor days	816.7	0.0	0.0	0.0	0.0	0.0	150.8
205W: Debt service ratio	0.0	0.0		0.0	0.0	0.0	31.9
209W: Current liquidity ratio	0.0	0.0	70.1	0.0	337.1	32.6	22.0
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	ImSWC	IRUWASA	JgSWB	JIRAMA	KbSWB	KdSWB	KgSWB
55W: % population served	5.3	64.2	0.0	63.9	34.7	57.9	0.0
77W: Per capita consumption (l/h/d)		0.6	12.0	92.3	366.2	0.1	0.0
90W: % unaccounted for water	33.3	45.0	29.9	31.2	13.3	40.9	0.0
92W: Availability of supply (hrs/day)	14.0	17.0	12.0	24.0	20.0	16.0	0.0
100W: % samples failing water quality	2.0	20.0	0.0	4.5	15.0	17.0	0.0
147W: Staff per 1000 connections	23.4	20.0	29.5	13.1	50.0	15.2	0.0
166W: Tariff cost recovery	22.4	80.6	19.7	0.0	103.6	114.9	8.6
174W: Average debtor days	0.0	0.0	0.0		0.0	457.4	0.0
205W: Debt service ratio	0.0	0.0	0.0		0.0	0.0	0.0
209W: Current liquidity ratio	135.3	0.0	0.0	0.0	1602.7	223.9	168.4
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	KnSWB	KtSWB	KWSAAR	KWSC	KwSWC	LiWSC	LNW	LSWC
55W: % population served	58.0	57.0	80.0	77.1		24.9	0.0	52.5
77W: Per capita consumption (l/h/d)	7.9	38.3	0.0	371.3	61.8	28.1	0.0	46.4
90W: % unaccounted for water	50.0	21.3	7.4	50.0	9.1	66.2	7.9	40.0
92W: Availability of supply (hrs/day)	15.0	14.0	6.0	16.0	12.0	9.0	24.0	24.0
100W: % samples failing water quality	10.0	4.0	0.5	10.0	0.0	5.0	0.0	17.0
147W: Staff per 1000 connections	14.8	23.7	10.0	11.6	32.1	121.6	0.0	14.4
166W: Tariff cost recovery	64.0	48.9	66.0	83.1	38.2	79.9	0.0	246.1
174W: Average debtor days	132.7	377.6	0.0	0.0	0.0	0.0	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	181.6	494.5	0.0	194.1	382.7	251.9	117.0	99.7
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	LuWSC	LWB	LYDEC	MANGAUNG	MW	MWSA	MWSC
55W: % population served	78.4	78.0	100.0	99.9	0.0	75.1	76.3
77W: Per capita consumption (l/h/d)	254.4	95.0	62.0	171.1	0.0	40.4	316.2
90W: % unaccounted for water	50.0	34.3	30.6	26.6	0.0	65.2	37.0
92W: Availability of supply (hrs/day)	16.0	24.0	24.0	24.0	24.0	12.0	16.0
100W: % samples failing water quality	5.0		0.2	0.0	0.5	40.0	5.0
147W: Staff per 1000 connections	10.3	24.8	7.0	4.1		16.6	8.6
166W: Tariff cost recovery	69.2	113.3	97.8	97.0	173.6	110.4	87.3
174W: Average debtor days	114.3	0.0	176.0	0.0	0.0	0.0	0.0
205W: Debt service ratio	37.0	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	70.1	104.8	103.3	0.0	214.3	128.4	227.0
55S: % population served	4.9	0.0	77.8	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	100.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	10.9	0.0	7.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	113.2	0.0	235.1	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	159.5	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	103.3	0.0	0.0	0.0	0.0

	NAQWASS	NAWEC	NCC-WSD	NgSWB	NRWB	NsSWB	NW
55W: % population served	70.3	35.1	46.9	0.0	43.8	6.7	50.0
77W: Per capita consumption (l/h/d)	68.5	131.5	160.4	0.0	35.4	172.6	0.0
90W: % unaccounted for water	47.4	23.3	51.5	60.0	28.6	45.7	0.0
92W: Availability of supply (hrs/day)	6.0	24.0	20.0	6.0	24.0	3.0	24.0
100W: % samples failing water quality	10.0	5.0	0.0	0.2	2.3	0.0	5.0
147W: Staff per 1000 connections	15.0	16.9	0.0	40.0	35.2	27.0	0.0
166W: Tariff cost recovery	57.0	148.5		17.2	132.3	22.5	100.0
174W: Average debtor days	0.0	0.0	87.2	0.0	0.0	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	125.0	661.6	0.0	1751.2	222.0	826.8	174.8
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	100.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	NWCPC	NWSC	NYEWASCO	OGSWC	ONAS	ONASdS	ONEA
55W: % population served	65.9	54.3	36.5	0.0	0.0	0.0	23.8
77W: Per capita consumption (l/h/d)		82.3	57.7	15.0	0.0	0.0	53.3
90W: % unaccounted for water	40.2	42.1	45.5	49.8	0.0	0.0	16.8
92W: Availability of supply (hrs/day)	19.0	24.0	24.0	3.0	0.0	0.0	0.0
100W: % samples failing water quality	8.5	3.0	0.0	1.0	0.0	0.0	2.0
147W: Staff per 1000 connections	7.3	21.1	10.8	35.0	0.0	0.0	9.8
166W: Tariff cost recovery	94.1	82.1	119.8	77.6	0.0	0.0	70.2
174W: Average debtor days	0.0	433.9	0.0	0.0	0.0	0.0	
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	
209W: Current liquidity ratio	217.2	145.4	104.1	15220.7	0.0	0.0	194.1
55S: % population served	0.0	3.2	0.0	0.0	79.7	24.6	0.0
96S: % sewage primary treatment	0.0	100.0	0.0	0.0	88.0	92.0	0.0
147S: Staff per 1000 connections	0.0	10.3	0.0	0.0	7.0	4.1	0.0
166S: Tariff cost recovery	0.0	313.6	0.0	0.0	70.0	55.6	0.0
174S: Average debtor days	0.0	433.9	0.0	0.0	41.7	185.5	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	23.4	0.0	0.0
209S: Current liquidity ratio	0.0	187.8	0.0	0.0	18.2	123.9	0.0

	ONED	ONEP	OsSWC	OySWC	PA	PEAS	PSWB	RADEEC
55W: % population served	100.0	79.8	67.7	21.6	114.3	99.8	36.8	95.0
77W: Per capita consumption (l/h/d)	97.9	72.7	229.1	62.9	154.0	43.3	172.0	67.8
90W: % unaccounted for water	38.1	3.9	13.6	38.1	25.9	22.2	45.2	21.2
92W: Availability of supply (hrs/day)	20.0	24.0	12.0	8.0	24.0	2.0	10.0	24.0
100W: % samples failing water quality	10.0	0.1	0.0	0.0	2.0	10.0	30.0	3.0
147W: Staff per 1000 connections	15.0	0.0	42.1	25.5	4.6	7.1	19.3	4.4
166W: Tariff cost recovery	114.3	0.0	34.7	166.5	164.9	72.7	52.5	124.4
174W: Average debtor days		0.0	0.0	0.0	0.0	0.0	0.8	362.7
205W: Debt service ratio		0.0	0.0	0.0	0.0	0.0	205.5	35.3
209W: Current liquidity ratio	19.2	0.0	637.9	730.3	0.0	66.3	378.7	0.0
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.2
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	178.5
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	355.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

	RDERDC	REGIDESO	RNET	RUL	RvSWB	RW	SBEE	SDE
55W: % population served	25.6			8.4		0.0	52.0	37.2
77W: Per capita consumption (l/h/d)	20.1	202.2	30.3	18.3	1.1	0.0	43.3	43.0
90W: % unaccounted for water	38.8	40.9	40.2	14.9	20.0	3.2	17.6	26.2
92W: Availability of supply (hrs/day)	6.0	24.0	24.0	12.0	10.0	24.0	24.0	23.0
100W: % samples failing water quality	25.0	0.0	10.0	0.0	15.0	1.0	0.0	
147W: Staff per 1000 connections	10.8	6.9	15.1		2.3	0.0	10.8	4.2
166W: Tariff cost recovery	157.6	163.4	79.0	42.0	22.2	117.1	60.9	111.1
174W: Average debtor days			362.3	0.0	0.0	45.1	440.6	
205W: Debt service ratio			27.9	0.0	0.0	8.7	0.0	
209W: Current liquidity ratio	1.0	15.7	11.8	142.9	3046.9	105.1	0.0	140.2
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	SEEG	SEG	SHUWASA	SNDE	SNE	SNEC	SODECI	SONEDE
55W: % population served	55.0	74.7	59.2	97.2	87.1	0.0	49.8	78.2
77W: Per capita consumption (l/h/d)	202.4	32.5	37.4	0.0	66.2	0.0	41.1	71.1
90W: % unaccounted for water	0.0	38.1	44.0		20.1	39.5	16.3	14.0
92W: Availability of supply (hrs/day)	0.0	24.0	13.0	24.0	24.0	24.0	20.0	24.0
100W: % samples failing water quality	3.0	3.0	20.0	0.0	10.8	0.0	20.0	1.8
147W: Staff per 1000 connections	3.3	7.3	20.0	0.0	10.2	0.0	43.6	4.6
166W: Tariff cost recovery	0.0	42.0	138.0		64.4	79.4	0.0	93.3
174W: Average debtor days			0.0				0.0	99.6
205W: Debt service ratio			0.0				0.0	10.3
209W: Current liquidity ratio	0.0	4.3	118.6	0.0	111.6	69.9	0.0	97.7
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	SONELEC	SoSWB	SRWB	STEE	TbSWSA	TUWASA	TUWSA
55W: % population served	47.8	10.9	1.5	0.0	35.7	55.9	84.5
77W: Per capita consumption (l/h/d)	140.6	0.0	0.0	103.3	15.0	88.5	59.4
90W: % unaccounted for water	37.6		0.0	31.1	30.0	34.3	36.9
92W: Availability of supply (hrs/day)	20.0	16.0	24.0	0.0	8.0	14.0	21.0
100W: % samples failing water quality	0.0	0.0	17.0	0.0	0.0	0.0	5.0
147W: Staff per 1000 connections	2.9	0.0	52.0	0.0		12.8	9.9
166W: Tariff cost recovery	172.2	0.0	173.6	0.0	3.8	80.3	142.5
174W: Average debtor days	517.2	0.0	0.0		0.0	0.0	0.0
205W: Debt service ratio	50.3	0.0	0.0		0.0	0.0	0.0
209W: Current liquidity ratio	215.9	3585.7	342.2	0.0	76.7	85.6	1279.8
55S: % population served	0.6	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	100.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	21.4	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	48.2	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	656.1	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	UW	UWSA	WASA	WBM	WUC	YbSWC	ZmSWB
55W: % population served	122.1	79.8	49.8	99.8	99.4	80.3	9.3
77W: Per capita consumption (l/h/d)	151.0	105.4	66.8	108.2	0.3	77.6	0.7
90W: % unaccounted for water	0.0	30.0	22.5	16.0	20.8	45.0	
92W: Availability of supply (hrs/day)	24.0	5.0	18.0	24.0	24.0	10.0	6.0
100W: % samples failing water quality	4.3	5.0	10.0	2.0	1.0	0.0	0.0
147W: Staff per 1000 connections	0.0	35.4	15.8	4.4	18.2	30.1	0.0
166W: Tariff cost recovery	0.0	11.0	102.3	145.6	235.1	3.1	18.7
174W: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205W: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209W: Current liquidity ratio	0.0	0.0	172.9	425.6	83.6	1297.7	0.0
55S: % population served	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96S: % sewage primary treatment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147S: Staff per 1000 connections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
166S: Tariff cost recovery	0.0	0.0	0.0	0.0	0.0	0.0	0.0
174S: Average debtor days	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205S: Debt service ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
209S: Current liquidity ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0

5.2 Supporting data

	AAWSA	ADE	AHC-MMS	AkSWC	AnSWC	AUWSA	AWB
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	1	1	1	0	0	0	1
Undertake water treatment?	1	1	1	1	1	1	1
No. of water treatment works	1	37	7	8	5	3	17
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	1	0	1	0	0	1	0
Undertake sewage treatment?	1	0	1	0	0	1	0
Undertake on-site sanitation services?	1	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	0	1	0	1	1	0	0
Autonomous?	1	0	1	1	1	1	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	0	1	0	1	0	0
Any sanitation services outsourced?	1	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	1	1	1	1	1
Regulated for sewage discharge?	1	0	0	0	0	1	0
Regulated for sludge disposal?	1	0	0	0	0	1	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	1	0	0	0	0	1	0
Regulated for customer service (water)?	1	1	1	1	1	1	0
Regulated for customer service (sanitation)?	1	0	0	0	0	1	0
No. of domestic connections - water (000s)	154	1940	36	5	42	13	0
No. of domestic connections - sanitation (000s)	2	0	0	0	0	2	0
Population served - water (000s)	2415	13579	340	87	3634	225	0
Population served - sanitation (000s)	10	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	45	378000	1	4468	8417	5539	0
Water - % abstraction costs	0%	0%	1%	0%	100%	1%	11%
Water - % manpower costs	13%	45%	14%	25%	0%	34%	38%
Water - % power costs	7%	23%	47%	3%	0%	32%	12%
Water - % chemicals costs	14%	10%	17%	3%	0%	2%	6%
Water - % other costs	66%	22%	21%	70%	0%	32%	33%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	1268	16842	518	560	1021	191	228
No. of staff - sanitation	206	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	98	0	0	0	0
Water - % capital funding non-commercial loans	26	0	0	0	0	0	0
Water - % capital funding grants	97	0	2	0	0	85	0
Water - % capital funding self-generated funds	23	0	0	0	0	15	100
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	0	0	1000	189	1441	181	1800
Sanitation - length of network (km)	0	0	0	0	0	35	0
Water - area of network supply (sq. km)	0	0	33	0	0	0	11000
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	BaSWB	BnSWB	BoSWC	BW	BWB	CoM	CoT	CoW
Undertake water abstraction?	0	1	1	1	1	1	0	1
Undertake bulk supply?	0	0	0	1	0	1	0	0
Undertake water treatment?	1	1	1	1	1	1	0	1
No. of water treatment works	1	27	1	1	2	1	0	1
Undertake water distribution?	1	1	1	1	1	1	1	1
Undertake sewerage?	0	0	0	0	0	1	1	1
Undertake sewage treatment?	0	0	0	1	0	1	0	1
Undertake on-site sanitation services?	0	0	0	0	0	1	1	1
Public ownership?	1	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0	0
Managed as government/municipal?	1	1	0	1	0	1	1	1
Autonomous?	0	1	1	1	1	0	0	0
Privately owned company?	0	0	1	0	0	0	0	0
Any water services outsourced?	1	0	0	1	1	0	1	1
Any sanitation services outsourced?	0	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	0	1	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	1	0	0
Regulated for sludge disposal?	0	0	0	0	0	1	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	1	0	0
Regulated for customer service (water)?	1	1	0	0	0	1	1	0
Regulated for customer service (sanitation)?	0	0	0	0	0	1	0	0
No. of domestic connections - water (000s)	14	10	58	4	29	21	148	35
No. of domestic connections - sanitation (000s)	0	0	0	0	0	21	0	0
Population served - water (000s)	368	1035	556	70	459	179	1187	239
Population served - sanitation (000s)	0	0	0	0	0	147	0	0
Annual domestic consumption (Ml/yr)	8157	10512	7751	904	10	5572	38083	8498
Water - % abstraction costs	0%	0%	0%	0%	0%	1%	76%	62%
Water - % manpower costs	48%	43%	24%	78%	18%	13%	9%	11%
Water - % power costs	20%	10%	3%	5%	52%	1%	2%	1%
Water - % chemicals costs	27%	27%	14%	1%	3%	24%	3%	0%
Water - % other costs	6%	20%	60%	16%	27%	61%	10%	25%
Sanitation - % manpower costs						47%		
Sanitation - % power costs						23%		
Sanitation - % chemicals costs						2%		
Sanitation - % other costs						28%		
No. of staff - water	598	502	1245	27	563	115	147	69
No. of staff - sanitation	0	0	0	0	0	285	0	0
Water - % capital funding new borrowings	0	0	2	100	0	0	0	67
Water - % capital funding non-commercial loans	53	0	1	0	0	100	88	25
Water - % capital funding grants	47	85	93	0	21	0	10	3
Water - % capital funding self-generated funds	0	15	4	0	79	0	2	5
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	100	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0	0
Water - length of network (km)	0	337	520	500	957	360	2100	1210
Sanitation - length of network (km)	0	0	0	0	0	280	0	0
Water - area of network supply (sq. km)	0	32739	800	20	760	167	424	82
Sanitation - area of network supply (sq. km)	0	0	0	0	0	144	0	0

	CRSWB	CRWB	CWA	CWSC	DAWASA	DMWS	DtSUWB	DUWASA
Undertake water abstraction?	1	0	1	1	1	0	1	1
Undertake bulk supply?	0	1	0	0	1	0	0	0
Undertake water treatment?	1	1	1	1	1	0	1	1
No. of water treatment works	8	1	5	2	3	0	9	1
Undertake water distribution?	1	1	1	1	1	1	1	1
Undertake sewerage?	0	0	0	0	1	1	0	0
Undertake sewage treatment?	0	0	0	0	1	1	0	0
Undertake on-site sanitation services?	0	0	0	0	0	1	0	0
Public ownership?	1	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0	0
Managed as government/municipal?	1	0	0	0	0	1	1	0
Autonomous?	1	1	1	1	1	0	1	1
Privately owned company?	0	0	0	0	0	0	0	0
Any water services outsourced?	1	0	1	0	1	1	1	0
Any sanitation services outsourced?	0	0	0	0	1	0	0	0
Regulated for drinking water quality?	1	1	1	0	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	1	0	0	0
Regulated for sludge disposal?	0	0	0	0	1	0	0	0
Regulated for tariffs/prices (water)?	1	1	0	0	1	1	1	0
Regulated for tariffs/prices (sanitation)?	0	0	0	0	1	0	0	0
Regulated for customer service (water)?	1	0	0	0	1	1	1	0
Regulated for customer service (sanitation)?	0	0	0	0	1	0	0	0
No. of domestic connections - water (000s)	19	7	249	3	89	440	31	6
No. of domestic connections - sanitation (000s)	0	0	0	0	10	0	0	0
Population served - water (000s)	817	86	1243	78	2018	2631	472	146
Population served - sanitation (000s)	0	0	0	0	100	0	0	0
Annual domestic consumption (Ml/yr)	779	1008	1700	1316	9490	114187	17996	3000
Water - % abstraction costs	0%	9%	0%	0%	1%	52%	0%	66%
Water - % manpower costs	69%	20%	61%	46%	10%	10%	51%	12%
Water - % power costs	9%	7%	25%	4%	37%	9%	1%	15%
Water - % chemicals costs	0%	3%	2%	5%	8%	0%	0%	3%
Water - % other costs	22%	61%	12%	45%	44%	29%	48%	4%
Sanitation - % manpower costs								
Sanitation - % power costs								
Sanitation - % chemicals costs								
Sanitation - % other costs								
No. of staff - water	541	115	997	60	1277	1162	823	121
No. of staff - sanitation	0	0	0	0	270	0	0	0
Water - % capital funding new borrowings	92	20	0	0	2	0	0	0
Water - % capital funding non-commercial loans	0	0	45	0	0	0	0	0
Water - % capital funding grants	8	0	30	100	60	7	100	2
Water - % capital funding self-generated funds	0	80	25	0	38	5	0	20
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0	0
Water - length of network (km)	650	0	5000	113	821	8800	708	110
Sanitation - length of network (km)	0	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	0	0	1000	30	1393	2301	167	0
Sanitation - area of network supply (sq. km)	0	0	0	0	5	0	0	0

	DWD	EbSWC	EDM	EDSUWB	EkSWC	EnSWC	EPEAL	FCTWB
Undertake water abstraction?	0	1	0	1	0	1	1	1
Undertake bulk supply?	1	0	0	0	1	0	1	1
Undertake water treatment?	1	1	1	1	1	1	1	1
No. of water treatment works	1	7	16	4	8	1	1	1
Undertake water distribution?	1	1	1	1	1	1	1	1
Undertake sewerage?	0	0	0	0	0	0	1	0
Undertake sewage treatment?	0	0	0	0	0	0	0	0
Undertake on-site sanitation services?	0	0	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0	0
Managed as government/municipal?	1	1	0	1	1	0	1	1
Autonomous?	0	1	0	0	0	1	0	1
Privately owned company?	0	0	0	0	0	0	0	0
Any water services outsourced?	0	1	0	0	0	1	0	0
Any sanitation services outsourced?	0	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	0	1	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	1	0
Regulated for customer service (water)?	1	1	1	0	0	1	1	0
Regulated for customer service (sanitation)?	0	0	0	0	0	0	1	0
No. of domestic connections - water (000s)	2	4	62	35	6	17	382	110
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0	0
Population served - water (000s)	151	253	868	770	3685	952	3824	2186
Population served - sanitation (000s)	0	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	0	1699	28042	20000	21220	11185	94648	65700
Water - % abstraction costs	0%	0%	0%	17%	0%		0%	0%
Water - % manpower costs	15%	35%	11%	33%	42%		43%	37%
Water - % power costs	84%	15%	1%	25%	19%		32%	4%
Water - % chemicals costs	0%	40%	26%	23%	32%		4%	18%
Water - % other costs	2%	10%	62%	1%	7%		21%	41%
Sanitation - % manpower costs								
Sanitation - % power costs								
Sanitation - % chemicals costs								
Sanitation - % other costs								
No. of staff - water	769	143	219	550	570	0	4300	972
No. of staff - sanitation	0	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	0	0	0	0	0	0
Water - % capital funding non-commercial loans	0	55	0	0	0	0	0	0
Water - % capital funding grants	80	35	0	80	0	0	0	5
Water - % capital funding self-generated funds	20	10	0	20	0	0	0	95
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0	0
Water - length of network (km)	200	0	1534	600	0	0	0	0
Sanitation - length of network (km)	0	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	0	0	0	15000	0	0	0	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0	0

	GCC	GCWWW	GoSWC	GVWC	GWCL	ImSWC	IRUWASA
Undertake water abstraction?	1	1	1	0	1	1	1
Undertake bulk supply?	0	1	0	0	0	0	0
Undertake water treatment?	1	1	0	1	1	1	1
No. of water treatment works	2	25	1	1	98	3	1
Undertake water distribution?	1	1	0	1	1	1	1
Undertake sewerage?	1	1	0	0	0	0	1
Undertake sewage treatment?	1	1	0	0	0	0	1
Undertake on-site sanitation services?	1	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	1	1	1	1	1	1	1
Autonomous?	0	1	0	1	1	1	0
Privately owned company?	0	0	0	0	1	0	0
Any water services outsourced?	1	1	0	0	1	1	0
Any sanitation services outsourced?	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	0	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	0
Regulated for customer service (water)?	1	1	0	1	1	1	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	41	708	0	8	235	9	5
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0
Population served - water (000s)	278	5555	20	151	7055	197	92
Population served - sanitation (000s)	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	12337	439389	20665	0	50871	16488	16
Water - % abstraction costs	11%	14%	0%	0%	0%	5%	0%
Water - % manpower costs	9%	70%	43%	21%	4%	16%	18%
Water - % power costs	33%	2%	14%	6%	5%	23%	56%
Water - % chemicals costs	41%	0%	0%	3%	2%	31%	5%
Water - % other costs	5%	14%	43%	70%	88%	25%	20%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	161	12463	721	303	4714	205	100
No. of staff - sanitation	0	0	0	0	0	0	0
Water - % capital funding new borrowings	98	0	32	4	1	20	0
Water - % capital funding non-commercial loans	0	0	0	92	26	0	0
Water - % capital funding grants	0	0	68	3	3	50	0
Water - % capital funding self-generated funds	2	0	0	0	70	30	0
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	1200	35000	97	0	0	380	0
Sanitation - length of network (km)	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	625	0	37	109	0	250	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	JgSWB	JIRAMA	KbSWB	KdSWB	KgSWB	KnSWB	KtSWB
Undertake water abstraction?	0	1	1	1	1	1	1
Undertake bulk supply?	0	0	1	0	0	0	0
Undertake water treatment?	1	1	1	1	1	1	1
No. of water treatment works	2	83	4	12	34	15	5
Undertake water distribution?	0	1	1	1	1	1	1
Undertake sewerage?	0	0	0	0	0	0	0
Undertake sewage treatment?	0	0	0	0	0	0	0
Undertake on-site sanitation services?	0	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	1	0	1	0	1	1	0
Autonomous?	0	1	1	1	1	0	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	0	0	0	1	0	1	0
Any sanitation services outsourced?	0	0	0	0	0	0	0
Regulated for drinking water quality?	0	1	1	0	1	1	0
Regulated for sewage discharge?	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	0	1	0	0	1	0	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	0
Regulated for customer service (water)?	0	1	1	0	1	1	0
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	15	89	9	75	9	81	27
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0
Population served - water (000s)	222	2372	153	1567	0	2031	1103
Population served - sanitation (000s)	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	651	29831	17044	33	0	2809	5727
Water - % abstraction costs	0%		0%	0%	0%	0%	0%
Water - % manpower costs	45%		45%	35%	66%	17%	29%
Water - % power costs	17%		2%	31%	1%	15%	19%
Water - % chemicals costs	30%		51%	18%	31%	64%	35%
Water - % other costs	8%		2%	16%	2%	4%	18%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	475	1252	425	1169	579	1200	711
No. of staff - sanitation	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	65	0	100	0	0	25
Water - % capital funding non-commercial loans	0	0	0	0	99	0	0
Water - % capital funding grants	100	0	0	0	1	100	42
Water - % capital funding self-generated funds	0	35	0	0	0	0	33
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	350	1724	0	1980	348	1431	651
Sanitation - length of network (km)	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	150	0	0	0	0	8442	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	KWSAAR	KWSC	KwSWC	LiWSC	LNW	LSWC	LuWSC
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	1	0	1	1	1	0	0
Undertake water treatment?	1	1	1	1	1	1	1
No. of water treatment works	1	7	68	1	8	21	1
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	0	1	0	1	0	0	1
Undertake sewage treatment?	0	1	0	1	0	0	1
Undertake on-site sanitation services?	0	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	1	0	1	1	1	0	0
Autonomous?	0	1	0	1	0	1	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	1	1	1	0	0	1
Any sanitation services outsourced?	0	0	0	0	0	0	1
Regulated for drinking water quality?	0	1	1	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	0	1
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	1
Regulated for customer service (water)?	1	1	1	1	1	1	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	1
No. of domestic connections - water (000s)	3	22	19	1	0	110	30
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	15
Population served - water (000s)	60	313	2318	199	0	6300	2352
Population served - sanitation (000s)	0	0	0	0	0	0	147
Annual domestic consumption (Ml/yr)	0	23361	25340	331	0	55901	28000
Water - % abstraction costs	66%	0%	0%	0%	7%	0%	2%
Water - % manpower costs	20%	21%	58%	22%	51%	19%	29%
Water - % power costs	11%	40%	13%	38%	21%	31%	16%
Water - % chemicals costs	3%	19%	24%	6%	2%	30%	5%
Water - % other costs	0%	20%	6%	34%	19%	20%	49%
Sanitation - % manpower costs							35%
Sanitation - % power costs							14%
Sanitation - % chemicals costs							0%
Sanitation - % other costs							51%
No. of staff - water	30	250	600	172	266	1587	340
No. of staff - sanitation	0	0	0	0	0	0	160
Water - % capital funding new borrowings	0	0	0	0	0	0	0
Water - % capital funding non-commercial loans	0	0	0	20	0	0	70
Water - % capital funding grants	0	0	100	60	10	15	0
Water - % capital funding self-generated funds	0	0	0	20	13	85	20
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	10
Water - length of network (km)	52500	648	957	225	936	1667	2300
Sanitation - length of network (km)	0	0	0	0	0	0	450
Water - area of network supply (sq. km)	8	54	32500	50	8892000	0	400
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	150

	LWB	LYDEC	MANGAUNG	MW	MWSA	MWSC	NAQWASS
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	1	0	0	1	0	1	0
Undertake water treatment?	1	0	1	1	1	1	1
No. of water treatment works	2	0	1	6	2	4	2
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	0	1	1	0	1	1	1
Undertake sewage treatment?	0	0	1	1	1	1	1
Undertake on-site sanitation services?	0	1	1	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	0	0	1	0	0	0	0
Autonomous?	1	0	0	1	1	1	1
Privately owned company?	0	1	0	0	0	0	1
Any water services outsourced?	1	0	1	1	1	0	1
Any sanitation services outsourced?	0	0	0	0	0	0	0
Regulated for drinking water quality?	0	1	1	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	1	0	0	0	0	0
Regulated for customer service (water)?	0	0	1	1	1	1	0
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	17	521	58	0	10	17	18
No. of domestic connections - sanitation (000s)	0	521	0	0	0	0	0
Population served - water (000s)	398	4500	416	0	338	191	246
Population served - sanitation (000s)	0	3500	0	0	0	0	0
Annual domestic consumption (Ml/yr)	8308	79196	23546	0	3984	16097	5400
Water - % abstraction costs	0%	74%	63%	0%	0%	0%	34%
Water - % manpower costs	33%	21%	14%	44%	20%	26%	19%
Water - % power costs	22%	2%	2%	16%	48%	35%	26%
Water - % chemicals costs	9%	0%	1%	10%	1%	15%	4%
Water - % other costs	36%	4%	20%	30%	31%	24%	17%
Sanitation - % manpower costs		64%					
Sanitation - % power costs		4%					
Sanitation - % chemicals costs		0%					
Sanitation - % other costs		32%					
No. of staff - water	499	3683	264	152	174	155	300
No. of staff - sanitation	0	3683	0	0	0	0	0
Water - % capital funding new borrowings	0	31	0	91	0	0	0
Water - % capital funding non-commercial loans	21	0	0	0	0	0	0
Water - % capital funding grants	0	0	0	0	2	0	0
Water - % capital funding self-generated funds	0	69	100	9	15	100	0
Sanitation - % capital funding new borrowings	0	31	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	69	0	0	0	0	0
Water - length of network (km)	780	3300	1500	64	146	250	280
Sanitation - length of network (km)	0	3900	0	0	0	0	0
Water - area of network supply (sq. km)	350	0	466	36689	124	30	55
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	NAWEC	NCC-WSD	NgSWB	NRWB	NsSWB	NW	NWCPC
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	0	1	0	0	0	1	1
Undertake water treatment?	1	1	1	1	1	1	1
No. of water treatment works	3	4	9	5	9	16	0
Undertake water distribution?	1	1	1	1	1	0	1
Undertake sewerage?	1	1	0	0	0	0	0
Undertake sewage treatment?	1	1	0	0	0	0	0
Undertake on-site sanitation services?	0	1	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	0	1	0	0	1	0	0
Autonomous?	1	0	1	1	1	1	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	1	1	0	1	1	1
Any sanitation services outsourced?	0	1	0	0	0	0	0
Regulated for drinking water quality?	1	1	1	1	1	1	1
Regulated for sewage discharge?	0	1	0	0	0	0	0
Regulated for sludge disposal?	0	1	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	0	1
Regulated for tariffs/prices (sanitation)?	0	1	0	0	0	0	0
Regulated for customer service (water)?	0	0	1	1	1	0	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	16	176	25	8	7	0	165
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0
Population served - water (000s)	205	1408	0	84	89	800	3743
Population served - sanitation (000s)	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	6233	82450	16575	891	4157	56000	357064300
Water - % abstraction costs	0%	0%	0%	0%	0%	32%	0%
Water - % manpower costs	27%	27%	48%	44%	21%	47%	16%
Water - % power costs	34%	6%	1%	15%	19%	0%	17%
Water - % chemicals costs	0%	12%	1%	7%	32%	0%	4%
Water - % other costs	38%	54%	50%	34%	28%	21%	64%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	305	0	1017	270	232	975	1456
No. of staff - sanitation	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	0	21	0	0	0
Water - % capital funding non-commercial loans	0	0	0	78	0	0	4
Water - % capital funding grants	0	0	100	1	78	0	96
Water - % capital funding self-generated funds	100	0	0	0	22	100	0
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	386	0	320	299	430	5000	0
Sanitation - length of network (km)	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	210	0	0	124	105	100000	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	NWSC	NYEWASCO	OGSWC	ONAS	ONASdS	ONEA	ONED
Undertake water abstraction?	1	1	1	0	0	1	1
Undertake bulk supply?	1	0	0	0	0	0	0
Undertake water treatment?	1	1	1	0	0	1	0
No. of water treatment works	15	2	85	0	0	6	0
Undertake water distribution?	1	1	1	0	0	1	1
Undertake sewerage?	1	1	0	1	1	1	0
Undertake sewage treatment?	1	1	0	1	1	1	0
Undertake on-site sanitation services?	0	0	0	1	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	1	0	0	0
Managed as government/municipal?	0	0	1	1	0	1	1
Autonomous?	1	1	1	1	1	0	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	0	0	0	0	0	1
Any sanitation services outsourced?	1	0	0	1	1	0	0
Regulated for drinking water quality?	1	1	1	0	0	1	1
Regulated for sewage discharge?	1	0	0	1	1	0	0
Regulated for sludge disposal?	1	0	0	1	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	0	0	1	1
Regulated for tariffs/prices (sanitation)?	1	0	0	1	1	0	0
Regulated for customer service (water)?	0	0	1	0	0	1	1
Regulated for customer service (sanitation)?	0	0	0	1	0	0	0
No. of domestic connections - water (000s)	48	5	30	0	0	55	16
No. of domestic connections - sanitation (000s)	8	0	0	681	58	0	0
Population served - water (000s)	1064	41	1452	0	0	554	722
Population served - sanitation (000s)	64	0	0	4175	576	0	0
Annual domestic consumption (Ml/yr)	11441	867	6570	0	0	10779	3902
Water - % abstraction costs	0%	0%	0%			16%	0%
Water - % manpower costs	44%	34%	39%			11%	45%
Water - % power costs	14%	23%	19%			2%	28%
Water - % chemicals costs	4%	11%	41%			71%	4%
Water - % other costs	38%	31%	1%			0%	23%
Sanitation - % manpower costs	43%			39%	12%		
Sanitation - % power costs	11%			9%	10%		
Sanitation - % chemicals costs	1%			9%	0%		
Sanitation - % other costs	45%			42%	78%		
No. of staff - water	1241	58	1094	0	0	657	299
No. of staff - sanitation	113	0	0	5027	235	0	0
Water - % capital funding new borrowings	76	0	0	0	0	2	0
Water - % capital funding non-commercial loans	0	0	0	0	0	0	0
Water - % capital funding grants	0	0	93	0	0	68	70
Water - % capital funding self-generated funds	24	100	7	0	0	30	30
Sanitation - % capital funding new borrowings	0	0	0	45	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	5	100	0	0
Sanitation - % capital funding self-generated funds	0	0	0	50	0	0	0
Water - length of network (km)	1633	100	500	0	0	2359	436
Sanitation - length of network (km)	255	0	0	9650	720	0	0
Water - area of network supply (sq. km)	275	44	6500	0	0	0	0
Sanitation - area of network supply (sq. km)	30	0	0	59029	0	0	0

	ONEP	OsSWC	OySWC	PA	PEAS	PSWB	RADEEC	RDERDC
Undertake water abstraction?	1	1	1	1	1	1	1	0
Undertake bulk supply?	1	0	0	1	0	0	0	0
Undertake water treatment?	1	1	1	1	1	1	0	1
No. of water treatment works	49	13	12	1	0	15	0	37
Undertake water distribution?	1	1	1	1	1	1	1	1
Undertake sewerage?	0	0	0	1	1	0	1	0
Undertake sewage treatment?	0	0	0	1	1	0	1	0
Undertake on-site sanitation services?	0	0	0	0	0	0	1	0
Public ownership?	1	1	1	1	0	1	1	1
Private ownership?	0	0	0	0	1	0	0	0
Managed as government/municipal?	0	1	0	1	0	0	0	0
Autonomous?	1	1	1	0	0	1	1	1
Privately owned company?	0	0	0	0	1	0	0	0
Any water services outsourced?	1	1	1	0	1	1	0	0
Any sanitation services outsourced?	0	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	1	1	1	1	1	0
Regulated for sewage discharge?	0	0	0	0	0	0	1	0
Regulated for sludge disposal?	0	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	1	0
Regulated for customer service (water)?	1	1	0	1	1	0	1	0
Regulated for customer service (sanitation)?	0	0	0	0	0	0	1	0
No. of domestic connections - water (000s)	2300	14	35	18	6	22	28	408
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	15	0
Population served - water (000s)	13570	1896	648	128	130	1023	174	12288
Population served - sanitation (000s)	0	0	0	0	0	0	109	0
Annual domestic consumption (Ml/yr)	360000	17560	12000	7104	490	27360	3758	60000
Water - % abstraction costs	0%	3%	0%	54%	52%	0%	64%	2%
Water - % manpower costs	41%	8%	39%	15%	4%	10%	14%	39%
Water - % power costs	21%	3%	21%	2%	32%	22%	6%	28%
Water - % chemicals costs	17%	61%	30%	0%	1%	36%	0%	8%
Water - % other costs	22%	25%	11%	29%	11%	32%	15%	23%
Sanitation - % manpower costs							20%	
Sanitation - % power costs							0%	
Sanitation - % chemicals costs							0%	
Sanitation - % other costs							80%	
No. of staff - water	6343	642	946	50	44	479	124	4635
No. of staff - sanitation	0	0	0	0	0	0	50	0
Water - % capital funding new borrowings	30	77	0	75	25	90	0	0
Water - % capital funding non-commercial loans	0	0	0	0	45	0	0	0
Water - % capital funding grants	20	21	79	23	20	10	0	9
Water - % capital funding self-generated funds	50	2	21	2	10	0	100	91
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	60	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	40	0
Water - length of network (km)	0	937	608	385	82	1000	412	9950
Sanitation - length of network (km)	0	0	0	0	0	0	208	0
Water - area of network supply (sq. km)	0	0	134	75	6	250	35	800
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	15	0

	REGIDESO	RNET	RUL	RvSWB	RW	SBEE	SDE	SEEG
Undertake water abstraction?	1	1	1	1	1	1	1	1
Undertake bulk supply?	0	0	1	0	1	1	0	1
Undertake water treatment?	1	1	0	1	1	1	1	1
No. of water treatment works	3	7	0	3	3	61	0	38
Undertake water distribution?	1	1	1	1	1	1	0	1
Undertake sewerage?	0	1	0	0	0	0	0	0
Undertake sewage treatment?	0	0	0	0	0	0	0	0
Undertake on-site sanitation services?	0	0	0	0	0	0	0	0
Public ownership?	1	1	0	1	1	1	1	1
Private ownership?	0	0	1	0	0	0	0	0
Managed as government/municipal?	0	0	0	1	0	0	0	0
Autonomous?	1	1	0	1	1	1	0	0
Privately owned company?	0	0	1	0	0	0	1	1
Any water services outsourced?	0	0	1	1	1	0	1	0
Any sanitation services outsourced?	0	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	1	1	1	1	1	1
Regulated for sewage discharge?	0	1	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	1	0	0	0	0	0	0
Regulated for customer service (water)?	1	1	1	1	0	1	1	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	23	42	0	200	0	87	275	66
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0	0
Population served - water (000s)	511	1326	17	10560	0	1246	3263	527
Population served - sanitation (000s)	0	4	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	17236	9280	5	3900	0	19258	43179	38948
Water - % abstraction costs	0%	0%	0%	0%	51%	0%	0%	
Water - % manpower costs	8%	32%	28%	88%	19%	27%	20%	
Water - % power costs	35%	23%	4%	5%	10%	12%	13%	
Water - % chemicals costs	5%	3%	0%	4%	5%	1%	2%	
Water - % other costs	51%	43%	68%	3%	15%	60%	65%	
Sanitation - % manpower costs								
Sanitation - % power costs								
Sanitation - % chemicals costs								
Sanitation - % other costs								
No. of staff - water	161	683	27	468	3410	936	1218	228
No. of staff - sanitation	0	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	40	0	84	0	72	0
Water - % capital funding non-commercial loans	0	13	0	0	0	0	0	0
Water - % capital funding grants	64	13	0	100	0	0	0	0
Water - % capital funding self-generated funds	37	74	60	0	16	0	28	100
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0	0
Water - length of network (km)	2038	1788	5	390	2747	3478	4700	1410
Sanitation - length of network (km)	0	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	0	56785	2	5000	18001	0	0	267667
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0	0

	SEG	SHUWASA	SNDE	SNE	SNEC	SODECI	SONEDE
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	1	0	0	0	0	0	0
Undertake water treatment?	1	1	0	1	1	1	1
No. of water treatment works	23	1	1	5	0	1	10
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	0	0	0	0	0	1	0
Undertake sewage treatment?	0	0	0	0	0	1	0
Undertake on-site sanitation services?	0	0	0	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	1	0	0
Managed as government/municipal?	1	1	0	1	0	0	1
Autonomous?	1	1	1	1	0	0	1
Privately owned company?	0	0	0	0	1	1	0
Any water services outsourced?	0	0	1	0	1	0	1
Any sanitation services outsourced?	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	1	1	1	1	1
Regulated for sewage discharge?	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	0	1	1	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	0
Regulated for customer service (water)?	1	1	1	1	1	1	1
Regulated for customer service (sanitation)?	0	0	0	0	0	1	0
No. of domestic connections - water (000s)	59	3	92	48	0	510	1460
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0
Population served - water (000s)	1494	91	1749	1517	0	7646	7516
Population served - sanitation (000s)	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	17413	1083	0	12671	51000	114584	189334
Water - % abstraction costs	0%	3%	100%	1%	0%		2%
Water - % manpower costs	18%	23%	0%	18%	22%		47%
Water - % power costs	8%	0%	0%	18%	11%		8%
Water - % chemicals costs	2%	37%	0%	8%	39%		2%
Water - % other costs	72%	37%	0%	55%	27%		41%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	426	73	796	541	1497	1504	7119
No. of staff - sanitation	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	0	0	0	0	0
Water - % capital funding non-commercial loans	0	0	0	0	0	0	60
Water - % capital funding grants	0	67	0	0	0	0	0
Water - % capital funding self-generated funds	100	33	0	0	0	0	40
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	1084	44	0	1473	0	0	26656
Sanitation - length of network (km)	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	60000	50	0	0	0	0	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	SONELEC	SoSWB	SRWB	STEE	TbSWSA	TUWASA	TUWSA
Undertake water abstraction?	1	1	1	1	1	1	1
Undertake bulk supply?	0	0	1	0	0	0	0
Undertake water treatment?	1	1	1	1	1	1	1
No. of water treatment works	1	3	0	0	2	1	1
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	1	0	0	0	0	1	1
Undertake sewage treatment?	1	0	0	0	0	1	0
Undertake on-site sanitation services?	1	0	0	0	0	0	0
Public ownership?	1	1	0	0	1	1	1
Private ownership?	0	0	1	0	0	0	0
Managed as government/municipal?	1	0	1	0	1	1	1
Autonomous?	1	1	0	0	1	1	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	0	1	0	0	0	1
Any sanitation services outsourced?	1	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	0	0	1	1	1
Regulated for sewage discharge?	1	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	0	1	1	1	0
Regulated for tariffs/prices (sanitation)?	1	0	0	0	0	0	0
Regulated for customer service (water)?	1	0	0	1	1	1	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	28	33	7	18	7	6	12
No. of domestic connections - sanitation (000s)	1	0	0	0	0	0	0
Population served - water (000s)	481	305	60	216	280	116	211
Population served - sanitation (000s)	4	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	8771	0	0	8137	785	2321	3300
Water - % abstraction costs	0%	1%	0%		0%	1%	18%
Water - % manpower costs	33%	13%	42%		4%	12%	29%
Water - % power costs	22%	18%	7%		6%	45%	7%
Water - % chemicals costs	0%	66%	28%		0%	16%	10%
Water - % other costs	45%	3%	24%		89%	26%	36%
Sanitation - % manpower costs	33%						
Sanitation - % power costs	22%						
Sanitation - % chemicals costs	0%						
Sanitation - % other costs	45%						
No. of staff - water	87	745	390	0	429	81	129
No. of staff - sanitation	17	0	0	0	0	0	0
Water - % capital funding new borrowings	1	0	80	0	0	97	0
Water - % capital funding non-commercial loans	0	0	0	0	0	0	0
Water - % capital funding grants	49	1	5	0	100	0	85
Water - % capital funding self-generated funds	50	1	15	0	0	3	15
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	810	500	0	0	0	356	192
Sanitation - length of network (km)	70	0	0	0	0	0	0
Water - area of network supply (sq. km)	0	0	0	0	0	137	47
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

	UW	UWSA	WASA	WBM	WUC	YbSWC	ZmSWB
Undertake water abstraction?	1	1	1	0	1	1	1
Undertake bulk supply?	1	0	1	0	1	0	0
Undertake water treatment?	1	1	1	0	1	0	1
No. of water treatment works	14	1	15	0	7	0	4
Undertake water distribution?	1	1	1	1	1	1	1
Undertake sewerage?	1	0	1	0	0	0	0
Undertake sewage treatment?	1	0	1	0	0	0	0
Undertake on-site sanitation services?	0	0	1	0	0	0	0
Public ownership?	1	1	1	1	1	1	1
Private ownership?	0	0	0	0	0	0	0
Managed as government/municipal?	1	0	0	1	0	1	1
Autonomous?	0	1	1	0	1	1	1
Privately owned company?	0	0	0	0	0	0	0
Any water services outsourced?	1	1	1	0	1	0	1
Any sanitation services outsourced?	0	0	0	0	0	0	0
Regulated for drinking water quality?	1	1	0	1	1	1	0
Regulated for sewage discharge?	0	0	0	0	0	0	0
Regulated for sludge disposal?	0	0	0	0	0	0	0
Regulated for tariffs/prices (water)?	1	1	1	0	1	1	1
Regulated for tariffs/prices (sanitation)?	0	0	0	0	0	0	0
Regulated for customer service (water)?	0	1	0	0	0	0	1
Regulated for customer service (sanitation)?	0	0	0	0	0	0	0
No. of domestic connections - water (000s)	725	10	20	7	45	22	2
No. of domestic connections - sanitation (000s)	0	0	0	0	0	0	0
Population served - water (000s)	6138	216	258	48	582	490	125
Population served - sanitation (000s)	0	0	0	0	0	0	0
Annual domestic consumption (Ml/yr)	319498	7751	2430	1669	29	12292	18
Water - % abstraction costs		0%	0%	61%	38%	0%	0%
Water - % manpower costs		24%	42%	11%	40%	63%	26%
Water - % power costs		3%	9%	0%	6%	1%	12%
Water - % chemicals costs		14%	4%	0%	1%	1%	47%
Water - % other costs		60%	45%	29%	15%	34%	15%
Sanitation - % manpower costs							
Sanitation - % power costs							
Sanitation - % chemicals costs							
Sanitation - % other costs							
No. of staff - water	1129	1245	455	34	826	687	340
No. of staff - sanitation	0	0	0	0	0	0	0
Water - % capital funding new borrowings	0	0	0	5	11	0	0
Water - % capital funding non-commercial loans	0	0	50	0	51	0	8
Water - % capital funding grants	0	0	40	0	0	83	19
Water - % capital funding self-generated funds	0	0	5	95	38	17	73
Sanitation - % capital funding new borrowings	0	0	0	0	0	0	0
Sanitation - % capital funding non-commercial loans	0	0	0	0	0	0	0
Sanitation - % capital funding grants	0	0	0	0	0	0	0
Sanitation - % capital funding self-generated funds	0	0	0	0	0	0	0
Water - length of network (km)	0	0	0	351	2910	392	0
Sanitation - length of network (km)	0	0	0	0	0	0	0
Water - area of network supply (sq. km)	32000	0	0	1024	230	0	0
Sanitation - area of network supply (sq. km)	0	0	0	0	0	0	0

6. BENCHMARKING

6.1 Background

Over the last fifteen to twenty years the spread and development of benchmarking activity has been such that it now embraces most industries, it is used throughout the world and is being adopted by the public as well as the private sector. It is increasingly used as a continuous, routine tool for a variety of purposes including reducing costs, improving efficiency, creating safer working environments, improving customer service and improving product quality.

The water industry world-wide has been relatively slow to embrace benchmarking, with a particular emphasis to date on metric benchmarking, for example ADB's Water Utilities Data Book, World Bank's Benchmarking Start Up Kit and the International Water Association's ongoing project to establish definitive Performance Indicators for Water Supply Systems.

However an increasing interest in comparative performance and best practice is apparent throughout the water industry, driven variously by regulators, international financial institutions, industry associations and by individual or groups of water service providers.

6.2 Benchmarking definitions

The purpose of benchmarking is to search for and identify best practice in whatever sector with the objective of implementing appropriate best practice and improving performance. Collection of data is not benchmarking, but is an integral step in the benchmarking path to improved performance.

Throughout this document two key definitions are used: -

- Metric Benchmarking – the quantitative measurement of performance against other organisations or self over time.
- Process Benchmarking – the analysis of a utility's own business processes and comparison with those of organisations with exemplary performance in those processes.

6.3 Metric benchmarking

Collection of data is an integral step in metric benchmarking but it is not the only step or necessarily the most important.

The Questionnaire, which follows in Appendix A, highlights the data requirements for this exercise. Some participating utilities will have the data required readily to hand; others will have more difficulty in supplying the data. It is for each participating utility to assess the potential value to them of collecting and supplying the data required, and more particularly for installing, and if necessary investing in, systems and procedures to generate the data sought.

To enable a valid assessment it is important to understand what data is being collected and why. Much effort goes into data collection without obvious output or end. The key is to collect only data required to reach the desired objective, and to utilise that data.

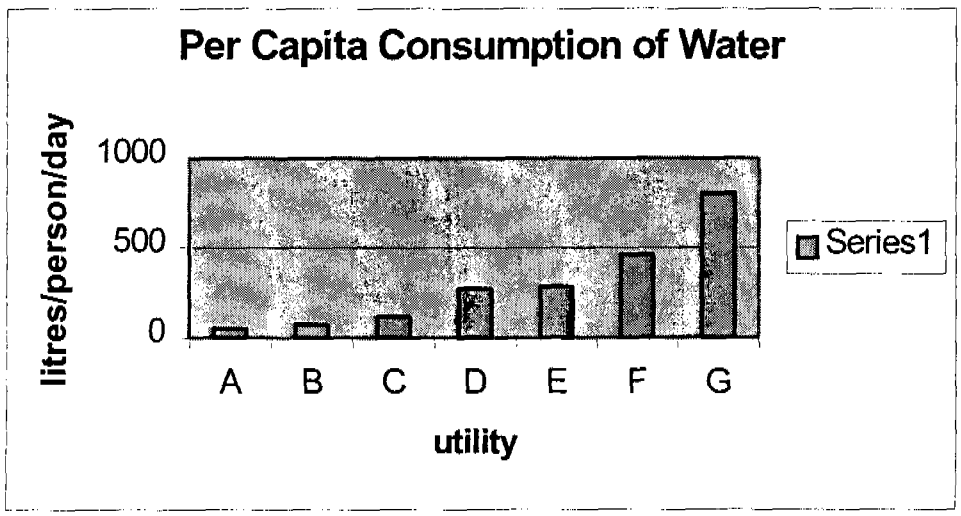
The Questionnaire collects data required to calculate a range of **performance indicators** with the aim of focussing attention on key issues, and for individual participating utilities focussing attention on particular areas where there are opportunities for improvement in performance or efficiency.

Which issues are key and therefore worthy of comparison have been established following a series of consultations with Regional Consultants and participating utilities. The data requirements included in the Questionnaire support these key issues. Thus it is the performance indicators which drive the data collection requirements.

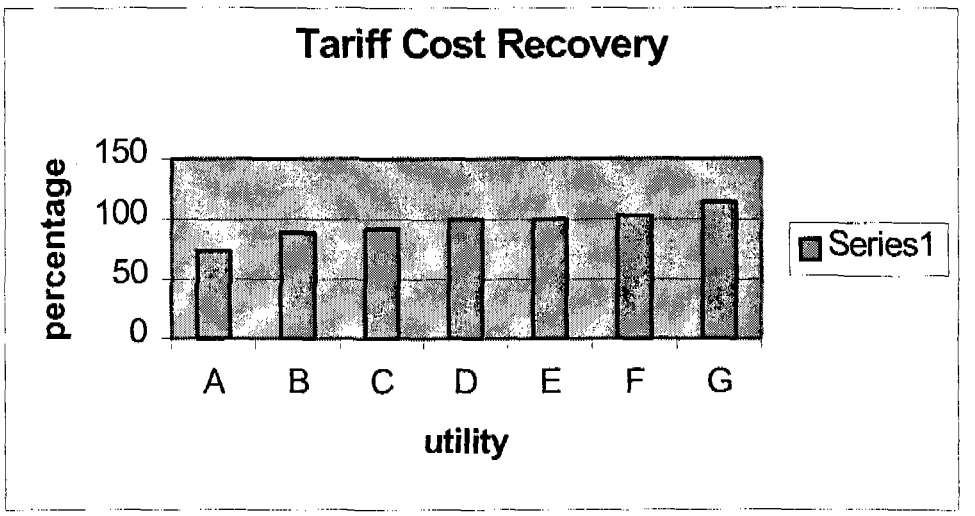
Participating utilities will make their own assessment of the focus they wish to place on particular indicators, and which areas of their operations are significant to them, but the comparison will not be possible without data input and will have lesser validity unless good data is supplied.

The Questionnaire collects data and generates the information required to undertake metric benchmarking. A single dataset may be of some interest including to the utility which has provided the data. What is of more interest is to compare one dataset with a range of other datasets at a given point in time, and ultimately over time: **the quantitative measurement of performance against other organisations or self over time.**

Metric benchmarking data is typically displayed graphically, as in Sections 3 and 4, and as detailed in the CD copy of the database. However a couple of illustrative examples could be: -



A more detailed review of the purpose of this indicator is contained in the Explanatory Notes to the Questionnaire, which follow in Appendix B. For this purpose it is sufficient to show that a participating utility, say utility F, can assess its situation relative to the situation of other participating utilities in the region. In respect of this indicator it may be possible to reach an assessment of to what extent per capita consumption could be considered to be excessive, bearing in mind other indicators such as resource constraints, the level of leakage and water losses and the utility's ability to recover the cost of operations.



Utility F recovers marginally more than its costs of operations through the tariff mechanism, and therefore, simplistically, any decision to address per capita consumption may rest with overall resource constraints.

In summary metric benchmarking aims to assemble data to facilitate objective comparisons between utilities, that is to identify the **apparent performance gap** between a utility and the best performing utility, to identify those best performing utilities, and to monitor performance and improvement over time.

6.4 Process benchmarking

Metric benchmarking provides the information for a utility to identify those areas where there is an apparent performance gap. It does not usually, unless a very complex data collection exercise has been undertaken, provide an understanding of **explanatory factors**. Explanatory factors, such as physical characteristics, geography, weather, population, and custom are key to understanding the apparent performance gap, and may add to or diminish that gap, generating a **real performance gap**. All metric benchmarking data should therefore be treated with a degree of caution and not necessarily taken at face value.

Process benchmarking seeks to utilise the metric benchmarking output as a basis for bridging the apparent performance gap such that best performance is achieved in the selected area.

Note that best performance for any utility may not be best performance as determined by metric benchmarking but rather the best that can be achieved in the particular circumstances of that utility. Thus a small utility may be able to achieve optimal cost efficiencies in its operations but may never be able to replicate the economies of scale of a larger utility.

How to tackle process benchmarking is discussed below. It is sufficient to state here that process benchmarking is the **analysis of a utility's own business processes and comparison with those of organisations with exemplary performance in those processes.**

It is key to add **and the adaptation of those processes to the utility's own circumstances, and then implementation.** Without implementation, ultimately nothing has been achieved. Implementation is thus vital to any benchmarking exercise, and the will to change practices and to implement changes for the good must be present from the commencement of any benchmarking exercise.

The rest of this section will focus on the application of process benchmarking and should serve as the outline for an action plan for best practice benchmarking. Utilities will develop action plans to suit their own specific needs and requirements.

6.5 Methodology for process benchmarking

In outline there are five steps in the exercise of process benchmarking: -

- Identifying key focus areas for comparison
- Gathering internal data for those key focus areas
- Identifying potential benchmarking partners
- Preparing for and undertaking benchmarking visits
- Implementing best practices

Each of these steps is discussed in more detail below.

Identifying key focus areas for comparison

The performance indicators generated by the Questionnaire are the first stage in identification of key focus areas for a particular utility. As a group, African water service providers have identified a range of focus areas with potential application to all water service providers in the region.

Each participating utility will generate the data and information necessary to populate the range of high-level performance indicators: the metric benchmarking exercise. The output of this exercise will be graphical representations of relative performance and a utility will be able to make an objective assessment of its level of performance in each of the key focus areas, relative to the other participants.

The utility will also, at this stage factor in those explanatory factors which may close or widen the apparent performance gap. It is not necessary to undertake detailed calculations in this regard, even, in some cases, if this was possible. Rather it is more important to form an appreciation of the impact of these explanatory factors.

From this analysis of performance indicators and explanatory factors the utility will be able to identify its own potential key focus areas.

ACTION PLAN STEP 1: use the output of the metric benchmarking exercise to identify potential key focus areas for your utility.

The second stage of this analysis is for the utility to confirm which of the potential key focus areas are to be its actual key focus areas.

All organisations are different, and indeed any organisation differs over time. Thus what is significant to one organisation may not be to another, and what is significant one year may not be the next. It is for every utility to form its own assessment of its key focus areas, not least because it will be committing time and resources to the benchmarking of these areas.

A utility will also want to prioritise key focus areas – it is probably not possible to address all the areas at once.

ACTION PLAN STEP 2: identify and prioritise key focus areas for your utility.

This should be based on an assessment of three inter-linked parameters: -

- Financial impact
- Importance to stakeholders
- Ability to change

How much importance to assign to each of these three parameters is a decision for each utility. For some financial impact will be all-important, for others other stakeholder issues will take priority.

If a utility is seeking cost savings and cost efficiencies then the potential financial impact of any focus area is most important, otherwise significant time and effort can be expended on areas with little financial benefit. The key is to identify areas which are significant cost-wise to the utility, or have significant cost implications.

Examples could be: -

- High impact on income – revenue collection efficiency
- High leverage on income – tariff cost recovery
- High cost – O&M costs
- High impact on costs – unaccounted for water

Assessment of financial impact may be formalised in a cash flow analysis or activity based costing, but can equally be based on an objective assessment of the actual situation.

The second parameter is an assessment of the relative importance to the utility's stakeholders of any of the potential focus areas. The stakeholders and their focus will differ from utility to utility and it is important to define what matters most in a particular utility situation.

Stakeholders tend to include customers, the owner (which may be government), the regulator (if appropriate), employees, the community and the media. Each utility should define its stakeholders and the relative importance it assigns to each stakeholder's needs and demands. For example a utility might place top priority on the owner and relatively little on the community or media. It would therefore focus its efforts on addressing those areas which matter to the owner. Another utility might operate in a situation where the media, for example the newspapers, have a high degree of influence over the community and the utility's customers, and perhaps indirectly a high degree of political influence. In this situation the utility might assign a much higher priority to the media as a stakeholder. Particular areas of interest to the media might include quality, availability of supply or level of customer complaints.

Each of these stakeholders has a range of needs of varying importance. Assessment of these needs can be formalised in a stakeholder prioritisation matrix for example, but can equally be based on an objective assessment of the actual situation.

The third parameter is the ability to change since it is not worth expending effort on areas where legislation or government policy, for example, preclude change. It is important however to differentiate between those areas which cannot be changed and those where there is not the will to change. For example if government policy precludes differential tariffs to discourage high use of water or disconnection to enforce payment of charges, is it possible to persuade government/the minister of the merit of changing? Benchmarking against other utilities with different practices and identifying the benefit of those practices may assist in this regard.

On the other hand if legislation does not permit disconnection it may be more difficult to influence this.

Based on these three parameters the utility should be able to make an objective assessment and prioritisation of its key focus areas.

Gathering internal data for those key focus areas

For the identified key focus areas it is essential for a utility to have a greater degree of understanding of that area and of the costs involved. This means that a utility will need to define how it undertakes the component activities in that key focus area and how much each of those component activities costs.

ACTION PLAN STEP 3: identify and document how the key component parts in the key focus area are undertaken by your utility.

It is usually helpful to document the component parts of each key focus area. This enables an objective understanding of how and why the utility carries out the task, and often throws up opportunities for improvement even at this stage, but it also enables a fair comparison with and assessment of another utility's operation in that area.

Documentation of an area should be based on formal procedures but also on direct observation and communication with staff involved. Invariably practice differs from procedure.

Documentation need not be too detailed but should cover all aspects of the area including planning, scheduling, technology, organisation and staff.

ACTION PLAN STEP 4: establish and document the cost of each of the key component parts in the key focus area.

Subject to existing data and information constraints it is at this stage that it is particularly beneficial to develop detailed costings. It is acknowledged that it can take time even years to assemble reliable data. This does not preclude process benchmarking in the meantime but this should be approached with some caution: performance gaps cannot be ascertained with accuracy and performance improvements cannot be monitored with accuracy.

Identifying potential benchmarking partners

At this stage identification of potential benchmarking partners should be relatively simple and should be derived from the output of the metric benchmarking exercise. Potential partners will be other water utilities within the region. Subject to that it is of course key that the potential partners are willing to benchmark!

At a later stage utilities may wish to identify water industry partners beyond the region. Data on these potential partners will not be available in the same format so effort will need to be expended in obtaining information and data necessary to assess their appropriateness as partners, and top rank performers.

Ultimately water utilities may wish to benchmark outside the water industry, and there is particular potential for this form of benchmarking world-wide. Clearly the key here is to identify where comparable best practice lies both in industry sector and business location.

ACTION PLAN STEP 5: establish at what level benchmarking partners are to be sought (within region, world-wide, out of industry) and identify appropriate benchmarking partners.

Preparing for and undertaking benchmarking visits

It is important that benchmarking visits are planned, that the timing and duration are clear to both parties and that the objectives and areas for benchmarking are similarly agreed between the parties. Visits should be agreed at a senior level on both sides.

If so-called "industrial tourism" is to be avoided it is key that an agenda is established and adhered to. Visits should include direct observation of activities, if possible. Invariably practice differs from procedure!

Benchmarking visits should be written up afterwards, and best practice observed should be recorded for use at the implementation phase.

ACTION PLAN STEP 6: benchmarking visits should be scoped, planned, undertaken and recorded for later reference.

Implementing best practice

No benchmarking exercise is complete unless the benefits are realised through implementation of change.

ACTION PLAN STEP 7: identify appropriate observed best practice for implementation in your utility.

Not all best practice is appropriate for implementation in another utility and often best practice cannot be implemented in its entirety or without appropriate modification to the circumstances of the benchmarking utility. It is for each utility to assess observed best practice and determine the appropriate level and means of implementation.

ACTION PLAN STEP 8: plan, implement and monitor the benefit of best practice recommendations and improvements.

Not all changes can be implemented at once and some take longer than others to implement. Where there is a range of changes to be implemented it is important that these are prioritised and implemented in an organised and measured manner. There is a cost or investment requirement for some changes even where these eventually result in cost savings. Other changes such as improvements in methods of operation and performance can have significant cost implications and these must be budgeted for.

Where possible the benefits of implementation, whether in terms of cost reductions or improved performance, should be measured and monitored, as this will give impetus to further benchmarking exercises.

ACTION PLAN STEP 9: consider application of benchmarking on an annual and on-going basis...

7. CONCLUSIONS

Data collection is the first step in any benchmarking exercise, essential for the calculation of performance indicators, which are used for the calculation of apparent performance gaps, for the identification of best performers and later for the monitoring of the implementation of improvements.

But data collection does not, of itself, lead to performance improvement. Process benchmarking offers significant opportunities for the understanding and application of best practice, with potential improvements in cost efficiency, operational performance, quality and customer service.

GLOSSARY

Short name	Utility full name	Country	Year
AAWSA	Addis Ababa Water And Sewerage Authority	Ethiopia	1999
ADE	Algerienne Des Eaux	Algeria	2000
AHC-MMS	AHC Mining Municipal Services Limited	Zambia	2001
AkSWC	Akwa Ibom State Water Corporation	Nigeria	1999
AnSWC	Anambra State Water Corporation	Nigeria	2000
AUWSA	Arusha Urban Wat Sup And Sew Authority	Tanzania	2001
AWB	Amatola Water Board	South Africa	2001
BaSWB	Bauchi State Water Board	Nigeria	2000
BnSWB	Benue State Water Board	Nigeria	1999
BoSWC	Borno State Water Coroporation	Nigeria	2000
BW	Bloem Water	South Africa	2000
BWB	Blantyre Water Board	Malawi	2000
CoM	City Of Mutare	Zimbabwe	2000
CoT	City Of Tygerberg	South Africa	2001
CoW	City Of Windhoek	Namibia	2000
CRSWB	Cross River State Water Board Ltd	Nigeria	2000
CRWB	Central Region Water Board	Malawi	2000
CWA	Central Water Authority	Mauritius	2000
CWSC	Chipata Water And Sewerage Company Limited	Zambia	1999
DAWASA	Dar Es Salaam Water & Sewerage Authority	Tanzania	2000
DMWS	Durban Metro Water Services	South Africa	2001
DtSUWB	Delta State Urban Water Board	Nigeria	2000
DUWASA	Dodoma Urban Water And Sewerage Authority	Tanzania	2000
DWD	Department Of Water Development	Tanzania	2000
EbSWC	Ebonyi State Water Corporation	Nigeria	2000
EDM	Energie Du Mali. S.A	Mali	1999
EkSWC	Ekiti State Water Corporation	Nigeria	2000
EnSWC	Enugu State Water Corporation	Nigeria	2000
EPEAL	Ets De Pr De Gest Et De Dist D'eau D'alger	Algeria	2000
EDSUWB	Edo State Urban Water Board	Nigeria	2000
FCTWB	F.C.T. Water Board , Abuja	Nigeria	2000
GCC	City Of Gweru	Zimbabwe	1999
GCWWW	General Company For Water And Wastewater	Libya	2000
GoSWC	Gombe State Water Corporation	Nigeria	2000
GVWC	Guma Valley Water Company	Sierra Leone	1999
GWCL	Ghana Water Company Limited	Ghana	2000
ImSWC	Imo State Water Corporation	Nigeria	2000
IRUWASA	Iringa Urban Water Supply And Sewerage	Tanzania	2000
JgSWB	Jigawa State Water Board	Nigeria	1999
JIRAMA	Jiro Sy Rano Malagasy	Madagascar	1999
KbSWB	Kebbi State Water Board	Nigeria	1999
KdSWB	Kaduna State Water Board	Nigeria	2000
KgSWB	Kogi State Water Board	Nigeria	2000
KnSWB	Kano State Water Board	Nigeria	1999
KtSWB	Katsina State Water Board	Nigeria	1999
KWSAAR	Keren Town Water Supply Administration	Eritrea	1999
KWSC	Kafubu Water & Sewerage Co. Ltd	Zambia	2001
KwSWC	Kwara State Water Corporation	Nigeria	1999
LiWSC	Liberia Water And Sewer Corporation	Liberia	2000
LNW	Lepelle Northern Water	South Africa	2001
LSWC	Lagos State Water Corporation	Nigeria	2000
LuWSC	Lusaka Water And Sewerage Company Ltd	Zambia	2000
LWB	Lilongwe Water Board	Malawi	1999

Short name	Utility full name	Country	Year
LYDEC	Lyonnaise Des Eaux De Casablanca	Morocco	2000
MANGAUNG	Mangaung Local Municipality	South Africa	2001
MW	Mhlathuze Water	South Africa	2001
MWSA	Mwanza Water And Sewerage Authority	Tanzania	1999
MWSC	Mulonga Water And Sewerage Company Limited	Zambia	2000
NAQWASS	Nakuru Water Company	Kenya	2000
NAWEC	National Water And Electricity Company Limited	The Gambia	1999
NCC-WSD	Nairobi City Council	Kenya	1998
NgSWB	Niger State Water Board	Nigeria	1999
NRWB	Northern Region Water Board	Malawi	2000
NsSWB	Nasarawa State Water Board	Nigeria	1999
NW	Namibia Water Corporation Ltd	Namibia	2000
NWCPC	National Water Conservation & Pipeline Corp.	Kenya	2000
NWSC	National Water And Sewerage Corporation	Uganda	2000
NYEWASCO	Nyeri Water & Sewerage Co. Ltd	Kenya	2000
OGSWC	Ogun State Water Corporation	Nigeria	2000
ONAS	Office National De L'assainissement	Tunisia	2000
ONASdS	Office National De L'assainissement Du Sénégal	Senegal	1999
ONEA	Office National De L'eau Et De L'assainissement	Burkina Faso	2000
ONED	Office National des Eaux de Djibouti	Djibouti	2000
ONEP	Office National De L'eau Potable	Morocco	2000
OsSWC	Osun State Water Corporation	Nigeria	1998
OySWC	Water Corporation Of Oyo State	Nigeria	2000
PA	Drakenstein Municipality	South Africa	2000
PEAS	*Programa Energia Agua E Saneamento*	Cape Verde	2000
PSWB	Plateau State Water Board	Nigeria	2000
RADEEC	Régie Autonôme De Dist.D'eau Et D'elect.De La Chaouia	Morocco	2000
RDERDC	Régie de Distribution d'Eau de la RDC	DR Congo	2000
REGIDESO	Régie De Prod Et De Dist D'eau Et D'électricité	Burundi	2000
RNET	Régie Nationale Des Eaux Du Togo	Togo	2000
RUL	Riveroaks Utilities Limited	Nigeria	2000
RvSWB	Rivers State Water Board	Nigeria	2000
RW	Rand Water	South Africa	2001
SBEE	Societe Beninoise D'electricite Et D'eau	Benin	2000
SDE	Senegalaise Des Eaux	Senegal	1999
SEEG	Société D'energie Et D'eau Du Gabon	Gabon	1999
SEG	Service Des Eaux De Guinée	Guinea Conakry	1999
SHUWASA	Shinyanga Urban Water And Sewerage Authority	Tanzania	2000
SNDE	Société Nationale De Distribution D'eau	Congo (Brazzaville)	2000
SNE	Societe Nationale Des Eaux	Niger	1999
SNEC	Société Nationale Des Eaux Du Cameroun	Cameroon	1999
SODECI	Societe De Distribution D'eau De Côte D'ivoire	Ivory Coast	2000
SONEDE	Sté Nat. D'exploitation Et De Dist. Des Eaux	Tunisia	2000
SONELEC	Societé Nationale D'eau Et D'électricité	Mauritania	1999
SoSWB	Sokoto State Water Board	Nigeria	1999
SRWB	Southern Region Water Board	Malawi	2000
STEE	Société Tchadienne D'eau Et D'electricité	Chad	1998
TbSWSA	Taraba State Water Supply Agency	Nigeria	1999
TUWASA	Tabora Urban Water & Sewerage Authority	Tanzania	2000
TUWSA	Tanga Urban Water Supply & Sewerage Authority	Tanzania	2000
UW	Umgeni Water	South Africa	2001
UWSA	Urban Water Supply And Sewerage Authority	Tanzania	2000
WASA	Water And Sewerage Authority - Lesotho	Lesotho	2000
WBM	Municipality Walvis Bay, Namibia	Namibia	2001
WUC	Water Utilities Corporation	Botswana	2000
YbSWC	Yobe State Water Corporation	Nigeria	2000
ZmSWB	Zamfara State Water Board	Nigeria	1999

APPENDIX A – FULL QUESTIONNAIRE

in association with the Department for International Development

BENCHMARKING QUESTIONNAIRE

CONTACT DETAILS

note

1	Utility name	
2	Utility identification	
3	Chief Executive	
4	Name of focal person	
5	Title	
6	Address	
7	Town or City	
8	Country	
9	Telephone	
10	Fax	
11	E-mail address	

Other Details

12	Reporting year ended	
13	Local Currency	

CURRENCY CONVERSION FACTOR	

UTILITY PROFILE

	which of the following services or activities do you undertake?	WATER	SANITATION
14	water abstraction		
15	bulk supply		
16	water treatment		
17	if so, enter number of treatment works		
18	water distribution		
19	sewerage		
20	sewage treatment		
21	on site sanitation services (include cesspit,VIP's and night soil collection)		

BENCHMARKING QUESTIONNAIRE

note			WATER	SANITATION	Confidence Factor
		Asset Ownership			
	22	are the assets you use in public ownership?			A B C D
	23	are the assets you use in private ownership?			
		Organisation			
	24	are you managed as part of government or municipal services?			
	25	are you an autonomous company/authority in public ownership?			
	26	are you a privately owned company?			
	27	if so, please state basis of operations (see notes)			
		Outsourcing			
	28	do you outsource or subcontract any of your activities or services?			
		Population			
	29	total population in your area of service			
	30	is your area of service national, regional,city or town?			
	31	% urban with formal status and security of land tenure			
	32	% urban with informal (unplanned) status and no security of land tenure			
	33	% rural			
		at present, is the total population in your area of service:			
	34	growing			
	35	showing no change			
	36	falling			
	37	change in reporting year (%)			

A = Audited data
B = Reliable data
C = Uncertain data
D = Estimate, no data

	Regulation	WATER	SANITATION
note			
	are you regulated for the following:-		
38	drinking water quality		
39	sewage discharge		
40	sludge disposal		
41	tariffs/prices		
42	customer service		
	General Finance		
43	do you produce an annual report and accounts?		
	if yes, please send a copy with the completed questionnaire		
44	do you regularly produce a business, corporate or strategic plan?		

BENCHMARKING QUESTIONNAIRE

	DEMAND MANAGEMENT	Indicator	WATER	SANITATION	Confidence Factor
note					A B C D
45	Service Coverage	Proportion of population served			
46		number of domestic connections at year end			
		multiplied by			
47		average number of persons per connection			
		equals			
48		total number of persons on domestic connections →	-	-	
49		total number of standpipes			
		multiplied by			
50		average number of persons per standpipe			
		equals			
51		total number of persons served by standpipe →	-		
52		total number of persons served indirectly			
53		total number of persons served →	-	-	
		divided by			
54		total number of persons in area of operations	-	-	
		equals			
55		proportion of population served →	0%	0%	
56		does your utility provide tankered or other supply/collection services to the population not connected to the network			

A = Audited data
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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

	DEMAND MANAGEMENT	Indicator		WATER	SANITATION	Confidence Factor
note						
57	System Expansion	Proportion of new connections in last year				A B C D
58		total new connections during last year				
59		total new domestic connections during last year				
60		number of domestic connections at year end		-	-	
		less				
61		total new domestic connections during last year		-	-	
		equals				
62		number of domestic connections at start of year	→	-	-	
63		% increase in domestic connections over year	→	0%	0%	
64		Proportion of new standpipes in last year				
65		total new standpipe connections in last year				
66		number of standpipes at year end				
		less				
67		total new standpipe connections in last year		-		
		equals				
68		number of standpipes at start of year	→	-		
69		% increase in new standpipes in last year	→	0%		

A = Audited data
B = Reliable data
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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		DEMAND MANAGEMENT	Indicator	WATER	SANITATION	Confidence Factor A B C D
	70	**Customer Demand**	**Connection incentives for low income h'holds**			
	71		**do you offer reduced or delayed connection charges to low income households?**			
	72		**Per capita consumption**			
	73		**total annual domestic consumption (cubic metres)**			
			divided by			
	74		**number of domestic connections at year end**	-	-	
			multiplied by			
	75		**average number of persons per connection**	-	-	
			equals →	-	-	
			divided by			
	76		**365 days in year**	365	365	
			equals			
	77		**per capita consumption (domestic)** →	-	-	
	78	**Conservation**	**does your organisation have a water conservation or water use reduction program or policy?**			
	79	**Sustainability**	**at current levels of demand, do you think that current water usage levels are sustainable?**			
	80		**do you think that your existing water resources are sufficient to meet future (10 year) demand?**			

A = Audited data
B = Reliable data
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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		OPERATIONS	Indicator	WATER	SANITATION	Confidence Factor
	81	**Capacity**	**Proportion of treatment capacity utilised**			A B C D
	82		**average volume of water treated (cum/day)**			
	83		**average volume of sewage treated (cum/day)**			
			divided by			
	84		**design capacity of treatment works (cum/day)**			
			equals			
	85		**proportion of capacity utilised** →	0%	0%	
	86	**Losses**	**Unaccounted for Water**			
	87		**total volume of water distributed in year (cum)**			
			less			
	88		**total legitimate consumption in year (cum)**			
			equals →	-		
			divided by			A = Audited data
	89		**total volume of water distributed in year (cum)**	-		B = Reliable data
			equals			C = Uncertain data
	90		**unaccounted for water** →	0%		D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

		OPERATIONS	Indicator	WATER	SANITATION	Confidence Factor A B C D
note						
	91	**Availability**	**Availability of Piped Water Supply**			
	92		availability of piped water supply (hours/day)			
	93		**Interruptions to Supply**			
	94		do you routinely record plant and infrastructure failures which affect customers?			
	95	**Quality**	**Proportion of Sewage Treated**			
	96		sewage treated to at least primary standard (% of sewage collected)			

A = Audited data
B = Reliable data
C = Uncertain data
D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		OPERATIONS	Indicator	WATER	SANITATION	Confidence Factor A B C D
97		**Quality**	**Attainment of Quality Standards**			
98			do you routinely monitor raw water quality?			
99			do you routinely monitor water quality in the distribution system?			
100			what proportion of samples fail to meet current quality standards at point of supply?			
101			do you promote public health education?			
		Sludge	**Sludge Treatment and Disposal**			
102			where do you put sludge?			
103			on farm land			
104			use as construction material			
105			store/landfill			
106			in a river			
107			in the sea			
108			incinerator or similar			

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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		OPERATIONS	Indicator		WATER	SANITATION	Confidence Factor A	B	C	D
109		Operating Costs	**Operating and Maintenance Costs**							
110			cost of water bought in or abstracted							
111			operating costs - manpower							
112			operating costs - power and fuel							
113			operating costs - chemicals							
114			all other operating costs (incl. administration)							
			equals							
115			total operating and maintenance costs	→	-	-				
116			proportion of water costs	→	0%					
117			proportion of manpower costs	→	0%	0%				
118			proportion of power and fuel costs	→	0%	0%				
119			proportion of chemicals costs	→	0%	0%				
120			proportion of other operating costs	→	0%	0%				
121		Maintenance	**Ratio of Planned to Unplanned Maintenance**							
122			planned maintenance cost							
			divided by							
123			unplanned maintenance cost							
			equals							
124			ratio of planned to unplanned maintenance	→	0%	0%				
125			**Relative Level of Maintenance Costs**							
126			total maintenance costs		-	-				
			divided by							
127			total operating and maintenance costs		-	-				
			equals							
128			relative level of maintenance costs	→	0%	0%				

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D = Estimate, no data

note		OPERATIONS	WATER	SANITATION	Confidence Factor A B C D
129	**Customer Service**	**Customer Complaints**			
130		does your organisation routinely maintain a record of customer complaints received?			
		If so, what is the main cause of complaint?			
131		water quality			
132		inadequate water supply			
133		bursts and leakage			
134		billing			
135		**Other Customer Indicators**			
136		do you conduct customer surveys to identify customer needs and demands?			
137		do you think that AIDS will have an impact on your customer base over the next five years?			
138	**Human Resources**	**Staff Levels and Skills**			
139		number of professionally qualified staff			
140		number of technically qualified and skilled staff			
141		number of unskilled staff			
142		number of outsourced staff			
		equals			
143		**total number of staff** →	-	-	

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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		OPERATIONS	Indicator	WATER	SANITATION	Confidence Factor
	144		**Number of Staff per 1000 Connections**			
	145		**total number of staff**	-	-	
			divided by			
	146		**total number of connections at year end**			
			equals			
	147		**number of staff per 1000 connections** →	-	-	
	148		**number of staff per cubic metre water distributed** →	-		
	149		**Relative Investment in Staff Training**			
	150		**total training costs in year**			
			divided by			
	151		**total payroll in year**			
			equals			
	152		**relative investment in staff training** →	0.0%	0.0%	
	153	**Health and Safety**	**Proportion of Lost Days**			
	154		**total days lost due to accidents in year**			
			divided by			
	155		**total days worked in year**			
			equals			
	156		***proportion of lost days*** →	0.0%	0.0%	
	157	**AIDS**	**Relative Impact of AIDS**			
	158		**do you think that AIDS will have a major impact on staff availability in the next 3 years?**			

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D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

	REVENUE	Indicator		WATER	SANITATION	Confidence Factor A B C D
note						
159	**Tariffs**	**Notional Average Tariff**				
160		**total direct tariff revenue in year**				
		divided by				
161		**total legitimate consumption in year (cubic metres)**		-		
		equals				
162		**notional average tariff**	→	-		
		please send a copy of your latest published tariff structure with your completed questionnaire				
163		**Cost Recovery**				
164		**total direct tariff revenue in year**		-	-	
		divided by				
165		**total operating and maintenance costs in year**		-	-	
		equals				
166		**cost recovery**	→	0%	0%	
167	**Revenue Collection**	**Collection Efficiency**				
168		**total revenue collected in year**				
		divided by				
169		***total direct tariff revenue in year***		-	-	
		equals				
170		**collection efficiency**	→	0%	0%	

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B = Reliable data
C = Uncertain data
D = Estimate, no data

BENCHMARKING QUESTIONNAIRE

note		REVENUE	Indicator	WATER	SANITATION	Confidence Factor A B C D
171		**Collection Period**	**Debtor Days**			
172			**accounts receivable at year end**			
			divided by			
173			**total direct tariff revenue in year**	-	-	
			multiplied by 365 equals			
174			**average debtor days** →	-	-	
175		**Metering**	**Extent of metered supply**			
176			**what percentage of all customers receive metered supply?**			
177			**what percentage of your meters were checked recalibrated or replaced in the reporting year?**			
178		**Lifeline tariffs**	**Lifeline Tariffs**			
179			**do you provide a minimum essential volume of water, free or at a reduced tariff?**			

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D = Estimate, no data

	REVENUE	Indicator	WATER	SANITATION	Confidence Factor
note					A B C D
180	**Disconnection**	**Disconnection Policy**			
181		**do you reduce flow or disconnect customers for non-payment of bills?**			A = Audited data B = Reliable data C = Uncertain data D = Estimate, no data
182	**Subsidy**	**Proportion of Revenue Subsidy**			
183		**revenue subsidy received in year**			
		divided by			
184		**total direct tariff revenue in year**	-	-	
		equals			
185		**proportion of revenue subsidy** →	0%	0%	

note		ASSETS	Indicator	WATER	SANITATION	Confidence Factor A	B	C	D
186		Depreciation	**Depreciation Policy**						
187			do you operate a depreciation policy for capital assets?						
188		Capital Replacement	**Rate of Capital Replacement**						
189			number of pumps replaced in year						
			divided by						
190			total number of pumps at year end						
			equals						
191			rate of capital replacement →	0.0%	0.0%				
192		Capital Funding	**Sources of Capital Funding**						
193			% funded by new borrowings						
194			% funded by non-commercial loans						
195			% funded by grants						
196			% funded by self-generated funds						
197			check total	-	-				
198			total amount of capital expenditure in year						
		Assets	**Length of Network**						
199			total length of network in km						
200			total area of network supply in sq km						
			Value of Assets						

A = Audited data
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D = Estimate, no data

201	total value of capital assets at year end			

note		BALANCE SHEET	Indicator		WATER	SANITATION	Confidence Factor A B C D
202		**Debt Service**	**Debt Service Ratio**				
203			**total annual debt service**				
			divided by				
204			**total direct tariff revenue in year**		-	-	
			equals				
205			**debt service ratio**	→	0%	0%	
206		**Liquidity**	**Current Liquidity Ratio**				
207			**total current assets**				
			divided by				
208			**total current liabilities**				
			equals				
209			**current liquidity ratio**	→	0%	0%	
210		**Inventory**	**do you categorise inventory as strategic and non-strategic?**				

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D = Estimate, no data

APPENDIX B – QUESTIONNAIRE NOTES

WATER UTILITY PARTNERSHIP
in association with the Department for International Development

BENCHMARKING QUESTIONNAIRE – EXPLANATORY NOTES

INSTRUCTIONS FOR COMPLETION

- The questionnaire package includes both these **EXPLANATORY NOTES** and the **BENCHMARKING QUESTIONNAIRE.**
- If you have not received either of these documents, or if you have any queries or wish to discuss any part of the questionnaire please contact me, as your regional consultant. My contact details are (*RC to provide full contact details including e-mail, fax, telephone and postal address*).
- The **EXPLANATORY NOTES** which follow below provide a detailed explanation of the purpose of each indicator as well as line-by-line explanations and guidance on completion of the questionnaire. The notes seem long but should make completion of the questionnaire much easier. Where possible, please refer to the notes before entering data on the questionnaire. You will find that the notes will answer many of the queries you may have.
- The **BENCHMARKING QUESTIONNAIRE** asks for a number of pieces of information. Some of this information will be easy to obtain; some may be more difficult. If you are unable to provide a piece of information, please consider providing your best estimate, and mark the appropriate confidence factor (see below). Please provide the information requested, but, if you are unable to answer a question, please leave the box blank and move to the next question.
- You will find four confidence factor boxes beside each item of data entry. These are only for you to indicate how certain you are about the information you have entered. There is no problem with entering your best estimate if you do not have certain information. Please mark these boxes with **1** as appropriate. Box A indicates data obtained from audited accounts or other formal records. Box B indicates data from utility or other records, where you are fairly confident of their accuracy. Box C is where you are less certain of the accuracy of the data and there is some element of estimation. Box D indicates your own best estimate.
- Completion of the questionnaire is voluntary, but we hope you will be willing to provide as much information as possible. If for any reason you feel that you are unable to provide some information because it is commercially sensitive please advise what information has been omitted, in a covering note.
- Each of the pieces of information requested will enable the completion of a range of performance indicators which will enable an objective comparison of utility performance. It is hoped that each participating utility or organisation will derive useful information from this exercise, perhaps focussing attention on areas where there is particular opportunity for improvement in performance or efficiency. However this is not a competition, there are no losers. All participants will benefit from providing as open and accurate information as possible.
- Some of the indicators will develop in usefulness when a trend can be established over a number of years, for example those relating to demand. It is hoped that the exercise can be repeated so that the benefit of this sort of information will grow. In any case the indicators will serve to focus attention on current key issues.
- The questionnaire may seem long and we hope that the benefit of providing the information requested will justify the effort expended in providing it.

Unfortunately, it is necessary to ask a number of questions to obtain as accurate a picture of the situation as possible. Even then there will still be a range of "explanatory factors" behind the different results. These are the reason why some information will seem out of line, and often derive from physical conditions or particular operating requirements. These will be discussed in more detail when the questionnaires have been completed.

CONTACT DETAILS

1. Enter the **full name of the utility or organisation** you represent.
2. Please also enter an **identification name, such as an abbreviation** of up to 20 letters, or initials e.g. GWSC, SBEE.
3. Enter the **name of the Chief Executive of your utility or organisation.**
4. Enter the **name of the focal person for SPBNET.Africa** (the main contact person) at your utility or organisation. Any queries will be addressed to the person named.
5. Enter the **title of the focal person**, for example, Director of Operations.
6. (6–8) Please enter the **contact address for the individual named as the focal person**, *see note 4.*
9. Enter the **telephone number of the focal person.** Please include country and area codes.
10. Enter the **fax number of the focal person.** Please include country and area codes.
11. Enter the **E-mail address of the focal person.**
12. Please enter the **year for which you are supplying data and answers** to the questions which follow. The year should be the most recent calendar year or an accounting period, such as the accounting year ended 31 March 2000. If you are unable to supply recent information please provide the latest information you have available. **Please ensure that all information provided relates to the same period; do not mix data from different years or accounting periods.**
13. Enter the **name of your local currency**, for example South African Rand. **Please provide all answers in your local currency.**

UTILITY PROFILE

Services or activities undertaken

14. If these activities include **control or responsibility for water abstraction,** including abstraction from reservoirs, rivers, and boreholes, enter **1** in box 14.
15. If these activities include **bulk supply of water** enter **1** in box 15.
16. If these activities include **water treatment** enter **1** in box 16.
17. If you have answered **1** for **16,** enter the **number of water treatment works** you operate.
18. If these activities include **water distribution** enter **1** in box 18.
19. If these activities include the **provision of piped sewerage services** enter **1** in box 19.
20. If these activities include **sewage treatment** enter **1** in box 20.
21. If these activities include **on-site sanitation services** (such as cesspit emptying and night soil collection) enter **1** in box 21.

Asset Ownership

22. If the **assets you use are in public ownership** enter **1** in box 22. Public ownership may mean that they are owned by a state owned company, that they are owned directly by a government or local government agency, entity or department, or that they are provided through a Department of Works or suchlike and owned and maintained by them. Leasing by a public body to a private operator means public ownership.
23. If the **assets you use are in private ownership** enter **1** in box 23. This may mean that the assets have been sold, or are provided under some form of private sector participation. **If your assets are a combination of public and private enter 1 in both boxes 22 and 23.**

Organisation

24. If you are **managed as part of government, local government or municipal services** enter **1** in box 24.
25. If you are a **separate company, authority or other statutory body in public ownership** enter **1** in box 25.
26. If you are a **privately owned company** enter **1** in box 26. If your company is **jointly owned by public and private bodies**, enter 1 in both boxes 25 and 26.
27. If privately owned state the **basis of your operations**, whether BOOT, Concession, Affermage, management, or other (specify).

Outsourcing

28. If you **outsource or sub-contract** some activities, for example operations or billing, or secure services as part of a BOOT scheme (such that operation is in private hands) enter **1** in box 28. Outsourcing could include the licensing of tankered water supply to consumers not connected to the network. If you provide tankered services directly please indicate in box 56.

Population

29. Based on the best information available to you please indicate the **total population in the area that you serve**. This is not the number of people you actually serve but rather the number within the boundaries of your overall area of responsibility. Please include the **estimated population of informal settlements and peri-urban areas** which are within the outer geographical limits of the utility area of responsibility but which, for legal or other reasons, are formally excluded from the utility area of responsibility.
30. Specify whether **your area of service** is the whole country, regional (province), or predominantly urban.
31. What **percentage of the population in your service area could be described as urban – with formal resident status, legal status and security of land tenure** (not the number of people you actually serve but rather the number within the boundaries of your overall area of responsibility)? Enter the **percentage** in box 31.
32. What **percentage of the population in your service area could be described as urban, but with informal status and/or no security of land tenure** (not the number of people you actually serve but rather the number within the boundaries of your overall area of responsibility)? This will probably

include squatter settlements and other unauthorised occupations of land. Enter the **percentage** in box 32.

33. What percentage of the population in your area of service (not the number of people you actually serve but rather the number within the boundaries of your overall area of responsibility) could be described as rural? Enter the **percentage** in box 33.
34. If you think that the **total population in your service is growing** at present, please enter **1** in box 34
35. If you think that the total population in your area of service is static, please enter **1** in box 35.
36. If you think that the total population in your service area is falling, please enter **1** in box 36.
37. It would be particularly helpful if you could provide in box 37 an indication of the **percentage change in the total population** in your area of service (refer box 29) for the reported year compared with the previous year. Enter negative percentage for a fall in population, positive percentage for an increase.

Regulation

38. Are you **regulated for drinking water quality**? If so enter **1** in box 38. **Regulation** is defined as the setting of standards and monitoring of performance against standards by an authority or individual outside your organisation, and may include quality and price regulation.

39. Are you **regulated on sewage discharge**? If so enter **1** in box 39. **Regulation** is defined as the setting of standards and monitoring of performance against standards by an authority or individual outside your organisation, and may include quality and price regulation.
40. Are you **regulated on sludge disposal**? If so enter **1** in box 40. **Regulation** is defined as the setting of standards and monitoring of performance against standards by an authority or individual outside your organisation, and may include quality and price regulation.

41. Are you **regulated on tariffs or prices**? If so enter **1** in box 41. **Regulation** is defined as the setting of prices, costs, revenues, etc and monitoring of performance against standards by an authority or individual outside your organisation.
42. Are you **regulated on customer service**? Customer service includes for example hours of supply and dealing with customer complaints. If so enter **1** in box 42. **Regulation** is defined as the setting of customer srevice standards and monitoring of performance against standards by an authority or individual outside your organisation.

General Finance

43. If you produce an **annual report and accounts** please enter **1** in box 43. If possible we would request that you send a copy of your latest report and accounts back with your completed questionnaire.
44. If you regularly produce a **business plan, corporate plan or strategic plan**, enter **1** in box 44.

DEMAND MANAGEMENT INDICATORS

Service Coverage

45. The first indicator to be calculated is the level of **Service Coverage.** The measure to be used is the proportion of population served, and the calculation of this is explained in notes 46 to 55 below. For our purpose we are basing our calculation on domestic supply only (although level of coverage of commercial and industrial consumers may be of significance). The indicator will show not only the relative ability of the utility or organisation to supply the local resident population, but also the potential future demand (and possible related capital requirements). Bear in mind that the population which is not served will be deriving water from boreholes, rivers or even illegal connections, in all cases with potential public health implications.
46. Please enter the **number of physical domestic connections into the utility network system**, including house connections and yard taps, at year-end, that is, at the end of the year for which you are reporting. This information should be available from your billing department. If you have 100% metering this figure should be the number of domestic meters.
47. Enter the **average number of persons per connection** at year-end. You may be able to provide an accurate assessment of this, or you may need to give your best estimate. Enter your degree of certainty in the Confidence Factor boxes to the right of the questionnaire, where box D indicates an estimate.
48. Total number of persons on domestic connections is calculated automatically. **You do not need to enter any information here.**
49. Enter the **number of communal standpipes, public taps or kiosks** you operate at year-end.
50. Enter average number of **persons you think you presently supply with water by each communal standpipe, public tap or kiosk** at year-end. These persons are also your direct customers.
51. The population served by standpipe will calculate automatically. **You do not need to enter any information here.**
52. Enter the **total number of persons that you think obtain their domestic water indirectly from the network system**, and are not included in boxes 48 and 51. This might include individuals resident in army barracks, police camps, dormitories and hostels (basically institutional demand), but should not include tourists or visitors who are not part of the resident population. Enter your degree of certainty in the Confidence Factor box.
53. The total number of persons served will be calculated automatically. **You do not need to enter any information here.**
54. Refer note 29. **You do not need to enter any information here.**
55. If you are using the questionnaire worksheet on the computer, the proportion of population served indicator will calculate automatically, and will show as a percentage coverage. If you are completing the questionnaire by hand there is no need to calculate this item, which can be left blank. **Note that the spreadsheet is programmed to show ERROR where the calculated proportion of population served is below 0% or above 100%.** Aside from these obvious errors it is for each utility to assess the reasonableness of the calculated proportion, and if in doubt to review the calculation, particularly notes 47, 50 and 52.
56. If you provide **tankered or other water supply services** to that part of the population which is **not** connected to the network please enter **1** in box 56. This does not include private tankers who obtain water from your company.

System Expansion

57. The next indicator is a measure of the **rate of expansion of the system.** We are basing this on the **proportion of new connections** in the last year, again using domestic connections (including house connections and yard taps) as a fair measure. This will serve to show the rate of progress on expanding service coverage, by provision of service to a greater proportion of the resident population, (see note 45). This indicator will be of more use when a trend can be established over a number of years, and will help to estimate future demand pressures.
58. Enter the **total number of new connections**, including government, commercial and industrial, and domestic customers, in the reporting year.
59. Enter the **total number of new domestic connections** (house connections and yard taps) in the reporting year.
60. Refer note 46. **You do not need to enter any information here.**
61. Refer note 59. **You do not need to enter any information here.**
62. The **number of domestic connections** at the start of your reporting year will calculate automatically, and **you do not need to enter any information here.**
63. The **proportion of new connections in the reporting year will calculate automatically**, and will show as a percentage increase in number of connections. Note that the spreadsheet is programmed to show ERROR where the calculated proportion of new connections is below 0% or above 100%. Aside from these obvious errors it is for each utility to assess the reasonableness of the calculated proportion, and if in doubt to review the calculation. **You do not to enter any information here.**
64. The next indicator is another measure of the **rate of expansion of the system.** We are basing this on the proportion of new standpipe connections (communal standpipes, public taps and kiosks) in the last year. This will serve to show the rate of progress on expanding service coverage, by provision of service to a greater proportion of the resident population, (see note 45). This indicator will be of more use when a trend can be established over a number of years.
65. Enter the **total number of new standpipe connections** (communal standpipes, public taps and kiosks) in the reporting year.
66. Enter the **total number of standpipes** (communal standpipes, public taps and kiosks) at year-end.
67. Refer note 65. **You do not need to enter any information here.**
68. The **number of standpipes** at the start of your reporting year will calculate automatically. **You do not need to enter any information here.**
69. The **proportion of new standpipes** will calculate automatically, and will show as a percentage increase in number of standpipes. **You do not need to enter any information here.**

Customer Demand

70. We wish to know if you provide **incentives for low-income households** to connect to the network.
71. If you offer to **low-income households reduced or delayed (staged payments) connection charges**, or indeed you do not charge for connection, enter **1** in box 71.
72. The next indicator is **customer demand**, based on per capita consumption (average consumption per person). As before this is based on domestic consumption to ensure a fair comparison between service providers, although non-domestic consumption could have a very significant impact on overall demand management requirements. Per capita consumption is a very useful measure because it shows a comparable per head level of usage and can identify excessive usage. Where there are water resource constraints, this

information can help to identify where there are opportunities for water conservation. Water consumption levels clearly impact on wastewater service levels, and control of one could reduce operational and capital pressures on the other. The information will become increasingly useful when trends can be established over a number of years.

73. Enter the **total volume of annual domestic consumption** for water. Where your output is 100% metered this should be the total metered **domestic** consumption over the year. Standpipe supply, public taps and kiosks should not be included. Where you have less than 100% metering you will need to provide your best estimate of domestic consumption. **Please make sure that your reported annual domestic consumption does not exceed the volume of water produced as reported in box 87 below.**
74. Refer note 46. **You do not need to enter any information here.**
75. Refer note 47. **You do not need to enter any information here.**
76. **You do not need to enter any information here.**
77. **Per capita consumption** will calculate automatically, and will show as cubic metres per person per day. **You do not need to enter any information here.**

Conservation

78. If your organisation has a water **conservation policy,** water use reduction programme, or public education programme to conserve water or to use water wisely please enter **1** in box 78.

Sustainability

79. All of the information in this section is intended to identify **pressure on resources** and give some indication where steps could be taken to address this. Overall **if you think that, based on current levels of demand maintained in the future, your current water usage levels are sustainable, please enter 1 in box 79.** Your answer may be based on an internal or external formal assessment of resource availability and conservation, or may be your own view as to whether you can continue to draw water at the present rate without depleting resources.
80. **If you think that existing water resources will be sufficient to meet future projected demand, (that is over the next ten years), enter 1 in box 80.** Your answer may be based on an internal or external formal assessment of resource availability and conservation, and demand projections, or may be your own view as to whether you can increase the level at which water is drawn to meet future demands, without depleting resources. Please note that the question is directed at availability of physical water resources and not at your organisation's ability to fund capital programmes to develop additional resources.

OPERATIONS INDICATORS

Capacity

81. The first indicator under this section is a measure of the utility's own **treatment capacity.** The measure to be used is the proportion of capacity utilised. This is intended to identify the level of spare capacity within the system based on current demand, to identify where there are particular capacity constraints, and where such constraints might be anticipated in the future based on demand

growth pressures. Such constraints may focus efforts on levels of unaccounted for water (see note 86) and conservation efforts. Note that the measure used is of treatment capacity rather than network capacity which would be more difficult to assess.

82. Enter the **annual average volume of water treated** per day during the reporting year.
83. Enter the **annual average volume of sewage treated** per day during the reporting year.
84. Enter the **maximum design capacity of your treatment works.** Where you have more than one water or wastewater treatment works, please enter total capacity, by **volume.**
85. **Proportion of capacity utilised** will calculate automatically and will show as a percentage utilised. **You do not need to enter any information here.**

Losses

86. The next indicator is a measure of **leakage and other system losses.** At this stage we are looking at technical losses, taken to include leakage and theft, but also unmetered provision of public water such as fire hydrants etc. The indicator is therefore a measure of the amount of water produced over and above the amount of water consumed and the principal difference is likely to be leakage/system losses. We are not at this stage looking at revenue losses, which would tend to be indicated in non-revenue water. For every system there is an economic level of leakage, that is, an optimum level of leakage for that system. This is derived from a balance between resource availability and demand, and cost of water, offset by the progressive cost of leakage reduction, such that in every system there is a point of acceptable leakage. For the present we will look only at the relative levels of leakage/unaccounted for water.
87. Enter the **total volume of water (treated and untreated) input to the distribution system**, including both water bought and water abstracted, and in either case regardless of whether or not it is treated by your organisation.
88. Enter **total volume of water consumed in the year**, that is the period for which you are reporting. Where your output is 100% metered this should be the total metered consumption over the year (domestic and non-domestic). This will provide the most accurate basis for identifying unaccounted for water. Where your output is less than 100% metered you will have to provide your best estimate of total legitimate consumption, but the ratio becomes significantly less reliable. Please check that reported total volume consumed does not exceed reported volume produced (box 87).
89. Refer note 87. **You do not need to enter any information here.**
90. **Unaccounted for water** will calculate automatically, and will show as a percentage of water produced in the year. **You do not need to enter any information here. Note that the spreadsheet is programmed to show ERROR where the calculated unaccounted for water is below zero% or above 100%. Aside from these obviously errors it is for each utility to assess the reasonableness of the reported result, and if in doubt to review the calculation.**

Availability

91. As a measure of **availability** we will use as an indicator **the average availability of piped water supply.** This will be measured in terms of the

average number of hours each day when a normal supply is provided. The average should be over all water users and over a year.

92. Enter the **average number of hours each day when you provide a normal supply of water**. Please provide an average over the whole system and over the whole year even when there are significant variations from one area to another.
93. Another measure is the recording of information relating to interruptions to supply.
94. If you routinely record **plant and infrastructure failures** which affect customers please enter **1** in box 94.

Quality

95. The final indicators in this section are measures of **quality**. On the wastewater side this is the proportion of sewage treated to at least primary standard.
96. **Enter as a percentage the proportion of sewage collected which is treated** to at least primary standard. Such treatment must include settlement to separate solids but does not have to include biological treatment.
97. The indicator used is the level of attainment of **quality standards**. The applicable standards are current local standards.
98. If you routinely **monitor raw water quality** at all or most main water sources please enter **1** in box 98.
99. If you routinely **monitor quality of water at various places in the distribution system** please enter 1 in box 99.
100. Enter the **proportion (as a percentage) of samples taken and tested that failed to meet current quality standards** at point of supply during the reporting year. If you do not undertake a regular system of sampling and testing then leave this box blank. If you have irregular data, please provide your best estimate.
101. If your utility promotes **public health education** please enter **1** in box 101.

Sludge

102. This question asks for information on how **sludges** are used or disposed of. Please enter **1** in the relevant boxes. 'Farm land' includes any use as a fertiliser, and 'store/landfill' includes any permanent or semi-permanent store, but not temporary storage, pending transport elsewhere. 'Incinerator' includes any high temperature treatment that breaks down organic matter.
103. If you use or dispose of sludge to **farmland** please enter 1 in box 103.
104. If you use sludge as a **construction material** please enter 1 in box 104.
105. If you dispose of sludge to a **store or landfill** please enter 1 in box 105.
106. If you dispose of sludge to **a river** please enter 1 in box 106.
107. If you dispose of sludge to **the sea** please enter 1 in box 107.
108. If you use or dispose of sludge to an **incinerator** please enter 1 in box 108.

Operating and Maintenance Costs

109. The first set of indicators seeks to assess relative levels of **operating and maintenance costs**. Our analysis will provide a breakdown of total operating and maintenance costs, allowing a comparison of the relative size of different components. For example power costs might comprise 30% of costs in one utility and 60% in another. This might identify variations in power costs or power efficiency. It might also reflect on efficiency in the other cost areas.

110. Enter the purchase **cost of water bought in or the cost of water abstracted (in local currency)** for the year for which you are supplying data. Abstraction costs would include the cost of licence fees paid to government or other external agency or resource owner, but does not include pumping or other operational costs.
111. Enter **total manpower operating and maintenance costs (in local currency)** for the year for which you are supplying data. Please include only direct operating costs and not administrative overheads. Please try to ensure that direct supervision and line management costs are included.
112. Enter **total operating power and fuel costs (excluded vehicle fuel) (in local currency)** for the year for which you are supplying data. Please include only direct operating costs and not administrative overheads.
113. Enter **total operating chemicals costs (in local currency)** for the year for which you are supplying data. Please include only direct operating costs related to chemicals such as chlorine, aluminium sulphate, etc.
114. Enter **all other operating and maintenance costs (in local currency)** for the year for which you are supplying data. Please ensure that all other operating costs are included here, particularly administrative overheads and outsourced/contracted costs, but NOT including depreciation, debt service etc, taxes or any capital expenditure. These costs should also include spare parts. If you are unable to break down operating costs in this way (refer notes 110 to 113) please enter total operating and maintenance costs on this line and leave the other lines blank.
115. Total operating and maintenance costs will calculate automatically. **You do not need to enter any information here.** Please ensure that this figure agrees with your own analysis of total operating costs. If it does not please check the breakdown of costs you have input.
116. The proportion of water costs will calculate automatically. **You do not need to enter any information here.**
117. The proportion of manpower costs will calculate automatically. **You do not need to enter any information here.**
118. The proportion of power and fuel costs will calculate automatically. **You do not need to enter any information here.**
119. The proportion of chemicals costs will calculate automatically. **You do not need to enter any information here.**
120. The proportion of all other operating and maintenance costs will calculate automatically. **You do not need to enter any information here.**

Maintenance

121. The second set of indicators in this section looks at **Maintenance**. One of these is the ratio of planned to unplanned maintenance. This is not an absolute measure and an optimal balance would be difficult to define with certainty. However it is possible to identify sub-optimal balances, for example where there is very little planned maintenance, with most of the maintenance being in response to failure. This should reflect in poor operating performance standards, such as repeated blockages or regular supply interruptions. Conversely excessive planned maintenance could result in high costs.
122. Enter value of total planned maintenance within the reporting year. That is, the amount in **local currency** which you actually spent on planned maintenance, maintenance programmes and normal maintenance routines. Planned maintenance covers all scheduled maintenance. Refer to the definition of unplanned maintenance in note 123. Maintenance costs should include labour, transport and materials/spares.

123. Enter value of total unplanned maintenance within the reporting year. That is, the amount in **local currency** which you actually spent on emergency repairs, breakdowns and all non-planned maintenance.
124. **Ratio of planned to unplanned maintenance** will calculate automatically as a percentage. **You do not need to enter any information here.**
125. Another **maintenance indicator** is the relative level of maintenance costs to total operating costs.
126. Total maintenance costs will calculate automatically. **You do not need to enter any information here.**
127. **You do not need to enter any information here.**
128. Relative level of maintenance costs will calculate automatically, and show as a percentage. **You do not need to enter any information here.**

Customer Service

129. Another measure of efficiency is the quality of **customer service.**
130. Does your organisation routinely maintain a **record of customer complaints received**? If so enter **1** in box 130.
131. If the main cause of customer complaints is **water quality** enter **1** in box 131.
132. If the main cause of customer complaints is an **inadequate water supply** enter **1** in box 132.
133. If the main cause of customer complaints is **bursts and leakage** enter **1** in box 133.
134. If the main cause of customer complaints is **billing** enter **1** in box 134.
135. **Other customer indicators.**
136. If you conduct **customer surveys** to identify customer needs and demands enter **1** in box 136.
137. If you think that **AIDS** will have an impact on the size of your customer base over the next five years enter **1** in box 137.

Human Resources

138. We have identified three measures relating to **Human Resources.** The first of these is staff levels and skills. This will provide a view of the proportions of staff at various broad levels as well as an overall view on the skills level of the workforce as a whole.
139. Enter **total number of professionally qualified staff** at year-end. Please enter the full time equivalent number of staff, that is including part time staff. Do not include technically qualified staff as these should be included in box 140.
140. Enter **total number of technically qualified and skilled staff** at year-end. Please enter the full time equivalent number of staff, that is including part time staff.
141. Enter **total number of unskilled staff** at year-end. Please enter the full time equivalent number of staff, that is including part time staff.
142. Enter **total number of outsourced staff** (contracted from other companies) at year-end. Please enter the full time equivalent number of staff, that is including part time staff.
143. Total number of staff will calculate automatically. **You do not need to enter any information here.**
144. Number of **staff per 1000 domestic connections** is a relatively good measure of overall staffing levels, although particular care needs to be taken when small utilities are being considered. These may lack the critical mass and economies

of scale of larger organisations and may therefore appear relatively over-staffed.

145. Refer note 143. **You do not need to enter any information here.**
146. Please enter the **total number of physical connections** into the utility network system, including domestic, commercial and industrial.
147. Number of staff per 1000 connections will calculate automatically. **You do not need to enter any information here.**
148. Number of staff per cubic metre water distributed will calculate automatically. **You do not need to enter any information here.**
149. Relative investment in **staff training** is a key measure of an organisation's investment in its staff and their development. A comparable indicator is the proportion of total payroll equating to training costs.
150. Enter **total training costs (in local currency)** for the reporting year. Please enter only costs borne by your utility and do not include training funded externally e.g. by the British Council or other local or expatriate agencies, or by government.
151. Enter **total payroll** for the reporting year, **(cost in local currency)**.
152. Relative investment in staff training will calculate automatically and show as a percentage. **You do not need to input any information here.**

Health and Safety

153. Lastly, looking at **Health and Safety**, an appropriate indicator would be proportion of lost days, covering injury time etc. Do not include sick leave, compassionate leave or annual leave.
154. Enter **total labour days lost** in the reporting year.
155. Enter **total labour days worked** in the reporting year. This could be calculated roughly from number of staff multiplied by average days worked in the year.
156. Proportion of lost days will calculate automatically, as a percentage. **You do not need to enter any information here.**

AIDS

157. Relative impact of **AIDS.**
158. If you think that **AIDS** will have a major **impact on staff availability** in the next three years enter **1** in box 158.

REVENUE INDICATORS

Tariffs

159. Two indicators will be calculated relating to **tariffs**. The first is simply the average tariff. This is a notional average tariff, and will not be the same as tariffs actually charged, which may include tariff bands and different tariffs for domestic and industrial customers. Tariffs will be defined in local currency and do not compare easily, particularly over time. Nevertheless it would be unusual not to include this as a core indicator.
160. Enter total direct tariff revenue for the reporting year (i.e. domestic, commercial or industrial not wholesale). This should be available from your utility's accounts if these are published. What is required is the actual amount billed for water services, and this may be available from your accounts department. Do not include revenue from other sales, sundry income or interest received. Do not include direct revenue subsidies, which might be included under revenue.

Enter as a **value in local currency**. Please ensure that revenue from wastewater services is not included.

161. Refer note 88. **You do not need to enter any information here.**
162. Average tariff will be calculated automatically, and shown as a value in local currency. **You do not need to input any information here.**

Please send a copy of your latest published tariff structure with the completed questionnaire.

163. The second tariff indicator is the measure of **tariff cost recovery**. This is a key measure of a utility or organisation's ability to cover its operating and maintenance costs (excluding interest and depreciation) from revenues, without reliance on external subsidies, and is generally perceived as an indication of a commercial approach to the provision of a public service.
164. Refer note 160. **You do not need to enter any information here.**
165. Refer note 115. **You do not need to enter any information here.**
166. Tariff cost recovery will calculate automatically, and will be shown as a percentage. **You do not need to enter any information here.**

Revenue Collection

167. Collection efficiency is a **revenue collection** indicator. This shows how much revenue has been collected compared with how much has been billed in the reporting year. A more complex indicator would identify how much that should be billed has been billed, and significant discrepancies can often be uncovered here.
168. Enter the total amount collected from customers (all customers) in the reporting year, as a **value in local currency**.
169. Refer note 160. **You do not need to enter any information here.**
170. Collection efficiency will be calculated automatically, and shown as a percentage of the amount billed in the year. **You do not need to enter any information here. If collection efficiency exceeds 100% please check – the answer may be correct but indicates that you have recovered revenue from previous years in excess of any amounts not recovered for the reporting year.**

Collection Period

171. Linked to the previous indicator, the **collection period** can be measured in terms of **debtor days**. This shows the total amount of debt outstanding at the end of the reporting period, in terms of days worth of billings.
172. Enter the **value of accounts receivable** at the end of your reporting period. If your utility or organisation produces formal accounts a figure for accounts receivable should be seen on the Balance Sheet. If accounts are not produced, then the figure should be the amount of revenue outstanding/unpaid at year end. How much money do your customers owe at year end? Enter as a **value in local currency**.
173. Refer note 169. **You do not need to enter any information here.**
174. Average **debtor days** will be calculated automatically. **You do not need to enter any information here.**

Metering

175. We now need some information on the extent of your **metered supply**. This helps to verify the accuracy of available supply data, subject of course to the accuracy of the meter readings.
176. Enter the **percentage** of all your customers who receive metered supply in box 176.
177. Enter the **percentage** of your meters that were checked, re-calibrated or replaced last year, in box 177.

Lifeline tariffs

178. **Lifeline tariffs** are low or free charges or tariffs for a particular level of water usage, usually judged as sufficient for basic living, and can be used to ensure that the poor can afford the bare minimum of water.
179. If your organisation provides a minimum essential volume of water free or at a reduced rate enter **1** in box 179.

Disconnection

180. **Disconnection** of customers is one method of forcing customers to pay their bills. In some places this is illegal, in others it is seen as a valid method of enforcing debt collection. Flow restriction is another option in case of non-payment.
181. Do you reduce supply or disconnect customers who do not pay their bills? If you do, enter **1** in box 181.

Subsidy

182. The final revenue indicator seeks to identify the **proportion of revenue subsidy received**, and ultimately whether this changes from year to year. In most countries revenue subsidies are in decline and are not perceived to be a sustainable basis for operation of the utility.
183. Enter the **total amount of revenue subsidy** received in the reporting year. **Include only direct revenue subsidies. Do not include other subsidies which may include fuel subsidy, import duty subsidy, tax subsidies, capital subsidies etc.** Enter as a **value in local currency**. If you have reported a net tariff cost recovery of less than 100% (refer box 166) and are not reporting a revenue subsidy please check. It may be that you are carrying a loss for the reporting year but it may also be that you are in receipt of some form of subsidy, however described or termed.
184. Refer note 160. **You do not need to enter any information here.**
185. *Proportion of revenue* subsidy will calculate automatically, and will be shown as a percentage of total revenue. **You do not need to enter any information here.**

ASSET INDICATORS

Depreciation

186. A **depreciation policy** indicates that a utility operates a formal accounting system and is charging the cost of asset ownership to its operations, that is, it is writing off the value of its assets as their useful life decreases.
187. If you operate a **depreciation policy** for capital assets, enter **1** in box 187.

Capital Replacement

188. **Capital assets** may often last a long time but they do not last forever. Every utility needs not only to expand and develop its assets to meet new operating demands, but also to replace assets as they wear out. Obviously the rate at which assets wear out will depend on how they have been maintained, and for every asset there is an optimal replacement date. Here we are looking for some measure of the rate of capital replacement, and this has been taken to be the rate of pump replacement, (abstraction, transmission and delivery pumps). Do not include sump pumps, dewatering pumps, chemical dosing pumps, sludge pumps etc.
189. Enter the **total number of pumps replaced** in the reporting year.
190. Enter the **total number of pumps** at year-end.
191. Rate of capital replacement will be calculated automatically, and will be shown as a percentage rate. **You do not need to enter any information here.**

ASSET INDICATORS

Capital Funding

192. The information sought is the method of **capital funding**, and the extent to which your utility is funding or supporting its own capital requirements.
193. As a **percentage**, enter the proportion of capital expenditure in the reporting year funded by new commercial borrowings.
194. As a **percentage,** enter the proportion of capital expenditure in the reporting year funded by non-commercial borrowings or subsidised loans.
195. As a **percentage**, enter the proportion of capital expenditure in the reporting year funded by grants or other subsidies.
196. As a **percentage**, enter the proportion of capital expenditure in the reporting year funded from self-generated funds, that is from the cash resources of the utility.
197. **This is a check total calculated automatically and should equal 100%.** If not please review your entries for 193, 194, 195 and 196. **You do not need to enter any information here.**
198. Enter the total amount of capital expenditure in the reporting year, **in local currency**.

Assets

199. Enter the **total length** of your water distribution network in km.
200. Enter the **total area** supplied by your water distribution network in sq. km.
201. Enter the **total value of capital assets** at year-end. Enter as a **value in local currency.**

BALANCE SHEET INDICATORS

Debt Service

202. The **debt service** ratio is a relative measure of the ability of an organisation to meet its debt service obligations from revenue earned.
203. Enter **total annual debt service**, that is the total amount of interest and principal paid during the reporting year, in respect of both long term and short borrowings and overdrafts. This should include interest and principal which has been capitalised. The total sum should be identifiable from the annual cash

movements of the utility. Enter as a value in local currency. **If you have indicated that some part of your capital program is funded by new borrowings (box 193) or non-commercial loans (box 194) it is likely that you will have a debt service requirement in the year. If you are reporting no debt service please check that, for example, your loans are still within a grace period covering both interest and principal.**

204. Refer note 160. **You do not need to enter any information here.**
205. Debt service ratio will calculate automatically and will be shown as a percentage. **You do not need to enter any information here.**

Liquidity

206. As a measure of **liquidity**, the current liquidity ratio will be used. This measures the ability of an organisation to meet its current liabilities from its current assets. In other words, do you have the resources to hand to meet your present financial commitments?
207. Enter your total current assets at year-end. This figure should come from your Balance Sheet, and should include cash, stock, debtors and other short-term assets. Enter as a **value in local currency**.
208. Enter your total current liabilities at year-end. This figure should come from your Balance Sheet, and should include overdrafts, short-term borrowings, and money owed to suppliers (creditors) and any other short-term liabilities. Enter as a **value in local currency**.
209. **Current liquidity ratio** will calculate automatically, and will be shown as a percentage. **You do not need to enter any information here.**

Inventory

210. If you categorise **inventory** as strategic and non-strategic enter **1** in box 210. Strategic inventory is that which is essential to the operation of the business, for example key spares, which would not otherwise be readily available.

APPENDIX C – CURRENCY CONVERSION FACTORS

The financial data taken from completed questionnaires were generally input in local currency values. It has therefore been necessary to normalise these local currency values in order to aid comparability. The normalisation has taken the form of conversion into US dollars. This appendix presents the conversion factors from local currency values into US dollars. Dividing the local currency values by these factors results in monetary equivalent values in US dollars.

The factors have been taken to be the conversion rate as at the end of the year, so for a questionnaire with a reporting year of 1999, the conversion rate as at 31 December 1999 has been taken as the currency conversion factor for all monetary values in the questionnaire. The exception is those questionnaires with reporting years of 2001: for these, the conversion rate as at 30 September 2001 has been taken as the currency conversion factor.

Country	1997	1998	1999	2000	2001
Algeria		58.60	69.20	77.90	76.57
Angola		603137.00	591995.00	13.62	22.34
Benin		562.00	653.28	705.00	718.39
Botswana		4.33	4.63	5.36	6.00
Burkina Faso		562.00	653.28	705.00	718.39
Burundi		505.00	629.20	792.00	839.41
Cameroon		562.00	653.28	705.00	718.39
Cape Verde		94.20	105.11	128.00	121.02
Central African Republic		562.00	653.28	705.00	718.39
Chad		562.00	653.28	705.00	718.39
Comoros		421.66	482.42	528.71	538.79
Congo (Brazzaville)		562.00	653.28	705.00	718.39
Djibouti		174.20	177.55	174.51	177.62
DR Congo		50.54	50.54	50.54	50.54
Egypt		3.32	3.44	3.47	4.14
Eritrea		9.60	9.60	9.60	9.60
Ethiopia		6.93	8.25	8.22	8.15
Gabon		562.00	653.28	705.00	718.39
Gambia		10.70	11.82	13.80	14.82
Ghana		2265.00	2737.96	6546.00	7138.87
Guinea Bissau		562.00	653.28	705.00	718.39
Guinea Conakry		1172.00	1204.38	1902.00	1885.96
Guinea Equatorial		562.00	653.28	705.00	718.39
Ivory Coast		562.00	653.28	705.00	718.39
Kenya		58.90	75.91	78.00	79.13
Lesotho		5.86	6.16	7.57	9.00
Liberia		1.00	1.00	1.00	56.17
Libya		0.37	0.46	0.51	0.64
Madagascar		5041.00	6409.49	6712.00	6299.46
Malawi		43.50	44.16	60.90	73.78
Mali		562.00	653.28	705.00	718.39
Mauritania		203.00	217.52	249.00	255.24
Mauritius		23.00	25.40	27.40	29.64
Morocco		9.19	10.07	10.90	11.25
Mozambique		12038.00	13091.00	16477.00	21276.00
Namibia		5.86	6.16	7.57	9.00
Niger		562.00	653.28	705.00	718.39
Nigeria		21.90	95.62	104.00	111.71
Rwanda		318.46	339.21	413.41	440.32
Sao Tome & Principe		6875.31	7015.56	8215.46	8727.52
Senegal		562.00	653.28	705.00	718.39
Seychelles		5.41	5.31	6.07	5.46
Sierra Leone		1581.00	2239.42	1999.00	2016.29
Somalia		3299.69	3388.84	3565.91	3604.41
South Africa		5.86	6.16	7.57	9.00
Sudan		1853.53	2502.21	253.19	257.92
Swaziland		5.86	6.15	7.57	9.00
Tanzania		665.00	803.65	790.00	892.16
Togo		562.00	653.28	705.00	718.39
Tunisia		1.09	1.25	1.41	1.42
Uganda		1331.00	1517.52	1816.00	1759.50
Zambia		1771.00	2431.39	3938.00	3494.18
Zimbabwe		36.60	38.61	54.20	55.00
UK	0.61	0.60	0.62	0.66	0.69

APPENDIX D – DATA QUALITY

This appendix indicates the quality of the questionnaire data returned from each utility. In the questionnaire, for appropriate data items, a confidence factor was requested to indicate the likely accuracy of the data item. The confidence factors are:

A: Audited data

B: Reliable data

C: Uncertain data

D: Estimate, no data

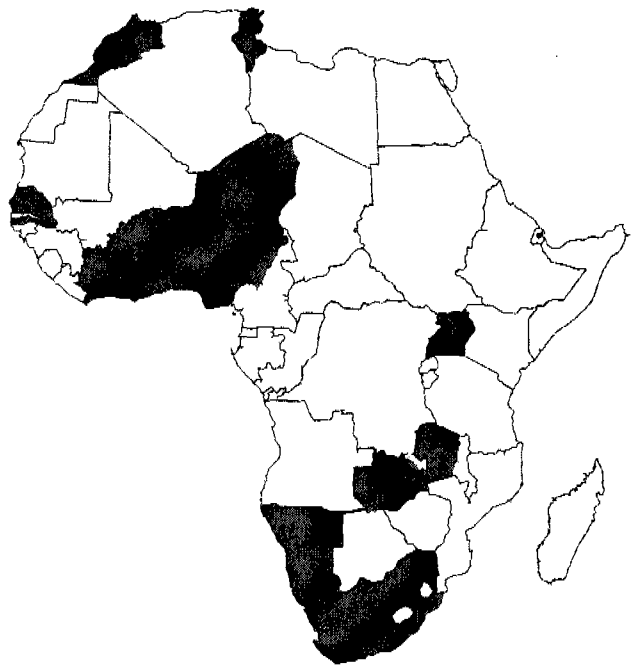
The table below presents a summary of all the confidence factors supplied by utilities. The table contains only those confidence factors supplied by utilities (in addition to these, the database assigns confidence factors to the calculated performance indicators by taking the "worst" confidence factor of all of the input data). If a confidence factor is not supplied by a utility for any data item, the database assigns a "D". In particular, note that the number of D's in the table below will be relatively high for utilities supplying water-only questionnaires since the database will assign a D to any questions not answered.

Utility	No. of questions with Confidence Factor:				Total
	A	B	C	D	
AAWSA	17	22	1	20	60
ADE	12	6	4	38	60
AHC-MMS	5	23	7	25	60
AkSWC	10	8	0	42	60
AnSWC	2	15	3	40	60
AUWSA	1	37	1	21	60
AWB	0	23	7	30	60
BaSWB	7	29	0	24	60
BnSWB	17	13	1	29	60
BoSWC	24	6	10	20	60
BW	9	11	10	30	60
BWB	10	15	1	34	60
CoM	23	26	3	8	60
CoT	9	11	11	29	60
CoW	10	25	3	22	60
CRSWB	3	20	0	37	60
CRWB	20	7	0	33	60
CWA	0	0	0	60	60
CWSC	31	6	0	23	60
DAWASA	2	13	24	21	60
DMWS	8	9	7	36	60
DtSUWB	0	12	15	33	60
DUWASA	0	17	0	43	60
DWD	0	15	4	41	60
EbSWC	14	15	2	29	60
EDM	0	0	0	60	60
EDSUWB	0	1	0	59	60
EkSWC	3	9	0	48	60
EnSWC	0	15	0	45	60
EPEAL	3	8	0	49	60
FCTWB	7	14	7	32	60
GCC	7	28	1	24	60
GCWWW	6	10	5	39	60
GoSWC	12	8	2	38	60
GVWC	20	6	1	33	60
GWCL	0	0	0	60	60
ImSWC	20	15	3	22	60
IRUWASA	7	10	11	32	60
JgSWB	4	5	6	45	60
JIRAMA	17	7	2	34	60
KbSWB	27	5	1	27	60
KdSWB	0	0	0	60	60
KgSWB	8	10	1	41	60
KnSWB	6	12	9	33	60
KtSWB	0	0	0	60	60
KWSAAR	0	1	4	55	60
KWSC	0	19	3	38	60
KwSWC	21	8	0	31	60
LiWSC	9	13	8	30	60
LNW	18	0	0	42	60
LSWC	24	1	0	35	60
LuWSC	11	19	26	4	60
LWB	26	6	1	27	60

Utility	No. of questions with Confidence Factor:				Total
	A	B	C	D	
LYDEC	14	26	1	19	60
MANGAUNG	1	23	8	28	60
MW	19	11	0	30	60
MWSA	8	16	5	31	60
MWSC	20	10	6	24	60
NAQWASS	7	15	15	23	60
NAWEC	0	32	1	27	60
NCC-WSD	0	0	7	53	60
NgSWB	12	5	2	41	60
NRWB	31	4	0	25	60
NsSWB	8	23	1	28	60
NW	8	12	4	36	60
NWCPC	13	7	11	29	60
NWSC	5	48	0	7	60
NYEWASCO	0	0	0	60	60
OGSWC	7	5	1	47	60
ONAS	16	16	6	22	60
ONASdS	30	0	0	30	60
ONEA	10	11	1	38	60
ONED	10	10	4	36	60
ONEP	2	7	1	50	60
OsSWC	8	16	10	26	60
OySWC	0	18	17	25	60
PA	12	6	8	34	60
PEAS	16	16	0	28	60
PSWB	16	27	2	15	60
RADEEC	46	11	2	1	60
RDERDC	25	0	4	31	60
REGIDESO	20	4	4	32	60
RNET	14	1	2	43	60
RUL	3	4	1	52	60
RvSWB	0	6	6	48	60
RW	30	9	0	21	60
SBEE	12	0	3	45	60
SDE	2	25	0	33	60
SEEG	10	4	4	42	60
SEG	2	21	6	31	60
SHUWASA	2	23	0	35	60
SNDE	9	1	1	49	60
SNE	11	16	0	33	60
SNEC	12	3	0	45	60
SODECI	0	0	0	60	60
SONEDE	14	33	1	12	60
SONELEC	44	9	1	6	60
SoSWB	0	4	0	56	60
SRWB	5	18	4	33	60
STEE	0	4	2	54	60
TbSWSA	8	20	8	24	60
TUWASA	19	8	8	25	60
TUWSA	13	15	7	25	60
UW	3	3	11	43	60
UWSA	5	0	0	55	60
WASA	14	8	8	30	60
WBM	1	33	4	22	60
WUC	0	29	9	22	60
YbSWC	21	7	5	27	60
ZmSWB	0	4	0	56	60

APPENDIX E – SUMMARY REVIEW OF PROJECT PARTICIPATION

Region:	Regional Consultant:	No. of utilities:	No. qu. received:	% received:
South Africa 1:	Cecil Chibi	34	16	47%
South Africa		26	10	38%
Swaziland		1	0	0%
Lesotho		1	1	100%
Namibia		4	3	75%
Mauritius		1	1	100%
Botswana		1	1	100%
South Africa 2:	Edwin Nyirenda	22	12	55%
Mozambique		5	0	0%
Malawi		5	5	100%
Zambia		7	5	71%
Zimbabwe		4	2	50%
Angola		1	0	0%
West Africa (English):	Mohammed Iliyas	44	39	89%
Nigeria		38	34	89%
Ghana		1	1	100%
Sierra Leone		1	1	100%
Liberia		1	1	100%
Guinea Bissau		1	0	0%
Cape Verde		1	1	100%
Gambia		1	1	100%
West Africa (French):	Godefroy Chekete	11	9	82%
Niger		1	1	100%
Mali		1	1	100%
Senegal		3	2	67%
Burkina Faso		1	1	100%
Guinea Conakry		1	1	100%
Ivory Coast		1	1	100%
Togo		1	1	100%
Benin		1	1	100%
Guinea Equatorial		1	0	0%
North Africa:	Mohammed Khrouf	25	9	36%
Libya		1	1	100%
Egypt		3	0	0%
Algeria		2	2	100%
Tunisia		2	2	100%
Morocco		16	3	19%
Mauritania		1	1	100%
East Africa 1:	Linus Materu	17	15	88%
Tanzania		11	10	91%
Uganda		1	1	100%
Kenya		4	4	100%
Seychelles		1	0	0%
East Africa 2:	Linus Materu	8	3	38%
Ethiopia		3	1	33%
Sudan		1	0	0%
Eritrea		1	1	100%
Djibouti		1	1	100%
Somalia		2	0	0%
Central Africa:	Johnson Oguntola	10	7	70%
Congo (DR)		1	1	100%
Congo Brazzaville		1	1	100%
Gabon		1	1	100%
Central African Republic		1	0	0%
Chad		1	1	100%
Rwanda		1	0	0%
Burundi		1	1	100%
Sao Tome and Principe		1	0	0%
Madagascar		1	1	100%
Cameroon		1	1	100%
TOTAL		171	110	64%



Geographic spread of participants trial project (the PI project) 1999

Geographic spread of participants in SPBNET.Africa 2001

APPENDIX F – CONTACT DETAILS

No.	Utility	Focal person	Title	Address	Town/City	Country	Tel.	Fax	Email
1	AAWSA	Mr Abebe Bellete	Technical Deputy General Manager		Addis Ababa	Ethiopia	251-1-12 44 40	251-1-55 37 93	aawsa.ha@telecom.net.et
2	ADE	M. AMOUCHE A	Charge		KOUBA / ALGER	Algeria	021 28 10 07	021 28 10 06	AMAOUCH2@Yahoo.fr
3	AHC-MMS	Kanyembo Ndhlovu	Head - Technical	P.O. Box 22494	Kitwe	Zambia	00 260 245045	00 260 224232	ndhlovuk@coppernet.zm
4	AkSWC	ENGR. EFIONG ASUQU0 BASSEY	ASSISTANT DIRECTOR	EKPEYONG STREET,PMB1138,	UYO,	Nigeria	234-85-203302 ,203109	234-85-2033109	
5	AnSWC	ENGR. MIKE DIKE	DEPUTY DIRECTOR (P/D/PM)		OGBETE, ENUGU	Nigeria	234-42-259493		
6	AUWSA	ENG. J.P.N. MOSHA	TECHNICAL MANAGER		ARUSHA	Tanzania	0255-27-2504163/2506124	0255-27-2504163/2508981	auwsa@habari.co.tz
7	AWB	Johan Kilian	Divisional Director Operations	Tecoma 5214	East london	South Africa	27 43 721-0814	27 43 721-0813	jkilian@amatolawater.co.za
8	BaSWB	ENGR. HARUNA MOHAMMED	PROJECT MANAGER		BAUCHI	Nigeria	234-77-542802 ; 542637	234-77-541859	harunaalfa@hotmail.com
9	BnSWB	ASHIEKAA JOHN.A	DIRECTOR, WATER SUPPLY		MAKURDI	Nigeria	234-44-533608 ,533662		
10	BoSWC	Engr. Habib Modu Abadan	Director of Operations		Maiduguri	Nigeria	+234-76-233364, +234-76-231826	+234-76-233364	habibabadam@hotmail.com
11	BW	Mr OJ Stadler	Manager: Admi & Finance		Pellissier	South Africa	051 - 4215351	051 - 4215333	admin@bloemwater.co.za
12	BWB	SAM KAPONDA	PLANNING OFFICER		BLANTYRE	Malawi	265 672 000	265 672 026	skaponda@bwb.mw
13	CoM	GEORGE MUSKWE	WATER AND SEWERAGE ENGINEER		MUTARE	Zimbabwe	263-20-64412	263-20-61002	georgem@mutare.intersol.co.zw
14	CoT	HEINRICH MOSTERT	TECHNICAL MANAGER - WATER SERVICES		CITY OF TYGERBERG	South Africa	27219187328	27219187444	mosterth@tygerberg.gov.za
15	CoW	Mr. F Brinkman	Chief Engineer -Bulk Water and Wastewater		Windhoek	Namibia	264-61-2902345	264-61-2902160	fbr@windhoekcc.org.na
16	CRSWB	Engr. Eiemi B. Etowa	Director, PRS	PMB 1177	Calabar	Nigeria	23487234243	23487234240	
17	CRWB	MR. KENT KAFATIA	OPERATIONS MANAGER	Private Bag 59, LILONGWE	LILONGWE	Malawi	(265) 758179, (265) 831595	(265) 758178	kafatia@malawi.net
18	CWA	JEET MUNBAUHAL	PRINCIPAL ENGINEER - OPERATIONS		PHOENIX	Mauritius	(230)601-5000 / (230)601-5137	(230)6866284	jeet@intnet.mu
19	CWSC	Mabvuto B Tembo	Public and Customer Relations Officer	P.O.Box 510464	Chipata	Zambia	260 62 21138	260 62 21403	cwsc@zamtel.zm
20	DAWASA	BONIPHACE KASIGA	DIRECTOR OF WATER SUPPLY	P.O. BOX 1573	DAR ES SALAAM	Tanzania	255 22 231191-4	255 22 2110999	dawasapiu@raha.com
21	DMWS	Neil A Macleod	Executive Director Durban Metro Water Services	Durban 4000	Durban	South Africa	(031) 302 4911	(031) 302 4646	Nam@dmws.durban.gov.za
22	DISUWB	ENGR.HARRISON A. DAFIOVOR	HEAD OF DEPARTMENT (TECH SERVICES)	EDUCATION ROAD,ASABA	ASABA	Nigeria	234-56-281367; 281368; 281369		dafiovor@yahoo.com
23	DUWASA	Eng. EPHRAIM BARIKI MINDE	BUSINESS MANAGER		DODOMA	Tanzania	255 026 41155/41179	255 026 2320060	DFEDOM @maf.org
24	DWD	MUSSA ALI SHEHE	PLANNING OFFICER		ZANZIBAR	Tanzania	255 024 22 32 770	255 024 22 32 770	shehemussa@hotmail.com or wmunam@cctz.com
25	EbSWC	Mr. Emma, Ewa Oko	Head of Planning, Research and Statistics	Ministry of Works Premises	Abakaliki	Nigeria	234-43-21074		copycraft@infoweb.abs.net
26	EDM	Boubacar I. MAÏGA	Chef Service Eau/ Bamako	BP : 69 BAMAKO	BAMAKO	Mali	(223) 224030/237591/742788	(223) 237600/225560	
27	EDSUWB	Peter Ogedegbe	General Manager	PMB 1146	Benin City	Nigeria	+234-52-250069, +234-52-250050		
28	EkSWC	ENGR. V.A. OKE	GENERAL MANAGER		ADO-EKITI	Nigeria	234-30-250614; 250750	234-30-250750	Ekiwater@infoweb.abs.net
29	EnSWC	ENGR.ADOLPHUS.E.CHUKWUEGBO	SENIOR ELECTRICAL ENGINEER		ENUGU	Nigeria	234-42-254196, 259697	234-42-254196	
30	EPEAL	M. TAZAIRT Ali	Ingénieur hydraulicien		KOUBA	Algeria	021 28 16 40	021 29 71 71 - 021 82 18 15	
31	FCTWB	Mr. M.O. Adebayo	Assl. Director (Planning and Operations)	ABUJA.	ABUJA, F.C.T.	Nigeria	234 - 9 - 2342937; 2341559	234 - 9 - 2344053	fctwb@alpha.linkserve.com
32	GCC	Eng E. Moffat	Assistant Director		Gweru	Zimbabwe	(263) 54-24071 or (263) 91-262735	(263) 54-24309	townclerk@gwerucity.org
33	GCWWW	M.Sc.Eng. Mohamed K.A.Elguel	0		Tripoli	Libya	218 21 4626001-8	218 21 4621435	GLCWW@hotmail.com
34	GoSWC	MR. SAMUEL D. KOLMI	AGM. PROJECTS AND PLANNING		GOMBE	Nigeria	234-72-220235	234-72-221534	
35	GVWC	RAYMOND AWOONOR-WILLIAMS	DEPUTY CHIEF ENGINEER		FREETOWN	Sierra Leone	232-22-224155 / 240704	232-22-228394	gumasl@sierratel.sl
36	GWCL	WHAJAH, ANDREW A.	AG. CHIEF MANGER(CORPORATE PLANNING)	P. O. BOX M194	ACCRA	Ghana	666781/662028	663552	GWSC@AFRICAONLINE.COM.GH
37	ImSWC	ENGR.MAXWELL OBINNA EHUJUO	HEAD WATER SERVICES DEPARTMENT		OWERRI	Nigeria	234-83-230512		
38	IRUWASA	RAMADHAN Y. MNG'AGI	ENGINEER	P. .O. BOX 570	IRINGA	Tanzania	0741 263554	255 026 2702434	rama_ym@yahoo.com
39	JgSWB	ENGR . LABARAN ADAMU	MANAGER, PLANNING		RINGIM	Nigeria	234.64.591146	234.64.5911185	
40	JIRAMA	ANDRIAMIRADO VICTOR	DIRECTEUR GENERAL ADJOINT EAU		ANTANANARIVO	Madagascar	261 - 20 - 22 - 234 57	261 - 20 - 22 - 244 40	jirdgao@dts.mg

No	Utility	Focal person	Title	Address	Town/City	Country	Tel	Fax	Email
41	KbSWB	GARBA SARDAUNA	ASSISTANT GENERAL MANAGER(O&M)		BIRNIN-KEBBI	Nigeria	234-68-320639, 320626, 320147	234-68-320636,321833	sardauna@skannet.com.
42	KdSWB	HASSAN MOHAMMED IBRAHIM	CHIEF ENGINEER (PROJECTS)		KADUNA	Nigeria	062-212239, 247959	062-247959, 240039	hasmohd@yahoo.com
43	KgSWB	MR.KOLAWOLE OLOGUN	DEPUTY GENERAL MANAGER		LOKOJA	Nigeria	234-58-220835, 220581		
44	KnSWB	Sule Ahmed Darma	General Manager (production)	PMB 3501, Kano	Kano	Nigeria	234-64-634705	234--64-634705	knswb@infoweb.abs.net
45	KtSWB	Usman U Nagogo	Asst. Director Commercials		Katsina	Nigeria	234-65-432567, 430940	234-65-432575	
46	KWSAAR	Tewolde Selomon Habtemariam	Senior Hydrogeologist		Asmara	Eritrea	291 1 119636	291 1 124625	wrd@gemel.com.er
47	KWSC	MR G MUKOSAYI	DIRECTOR OF ENGINEERING		NDOLA	Zambia	00 260 2 618453	00 260 2 622177	kwsc@zamnet.zm
48	KwSWC	ENGR. B.A. ALIYU	A.G.M. (DISTRIBUTION)		ILORIN	Nigeria	234-31-220147 ,221748	234-31-221675	Ciwat@cyberspace.net.ng.
49	LIWSC	J. KOWOYAN KPAKOLO	DEPUTY MANAGING DIRECTOR/TECH. SERVICES		MONROVIA	Liberia	226950/227220/226880/226949	227220/226949	
50	LNW	B S van der Merwe	Manager: Organisational Development		Phalaborwa	South Africa	(015) 781 6821/2/3 or 781 1111	(015) 781 6144	gmfin@lepelle.co.za
51	LSWC	Engr. (Mrs.) Celia B. Olajide	Privitisation Coordinator	P. O. Box 555, Ijora	Lagos	Nigeria			
52	LuWSC	Innocent Chiliboy	Corporate Planning Co-Ordinator	P.O. Box 50198	Lusaka	Zambia	26-01-250666 / 26-01-250002 / 26-01-250682	26-01-252578	LWSC@Zamnet.ZM
53	LWB	T.M.C.MKANGAMAH	SUPPLY ENGINEER		LILONGWE	Malawi	(265)750366 or (265)873518 or (265)835031	(265)752294	wdmoya@lwb.malawi.net
54	LYDEC	Omar BOUZIANE	Contrôleur de gestion	BP 16048	Casablanca	Morocco	00.212.(0)22.54.90.56	00.212.(0)22.54.90.97	omar.bouziane@lydec.co.ma
55	MANGAUNG	H P B BONING	FIRST ENGINEER		BLOEMFONTEIN	South Africa	051 405 8878	051 405 8701	sing8@civic.bfncouncil.co.za
56	MW	Theo Graham	Administration Manager		Richards Bay	South Africa	035-902-1000	035-751-1360	tgraham@mhlathuze.co.za
57	MWSA	Eng. ELLON ABUOK	PLANT AND ELECTRICAL ENGINEER	P. O. BOX 317	MWANZA	Tanzania	028 2500547	255 028 42415	majimjini.mza@twiga.com
58	MWSC	Ison Simbeye	Director Technical Services		Chingola	Zambia	260-02-312199	260-02-313681	imsimbeye@mulonga.com.zm or chamaa@nchanga.com.zm
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