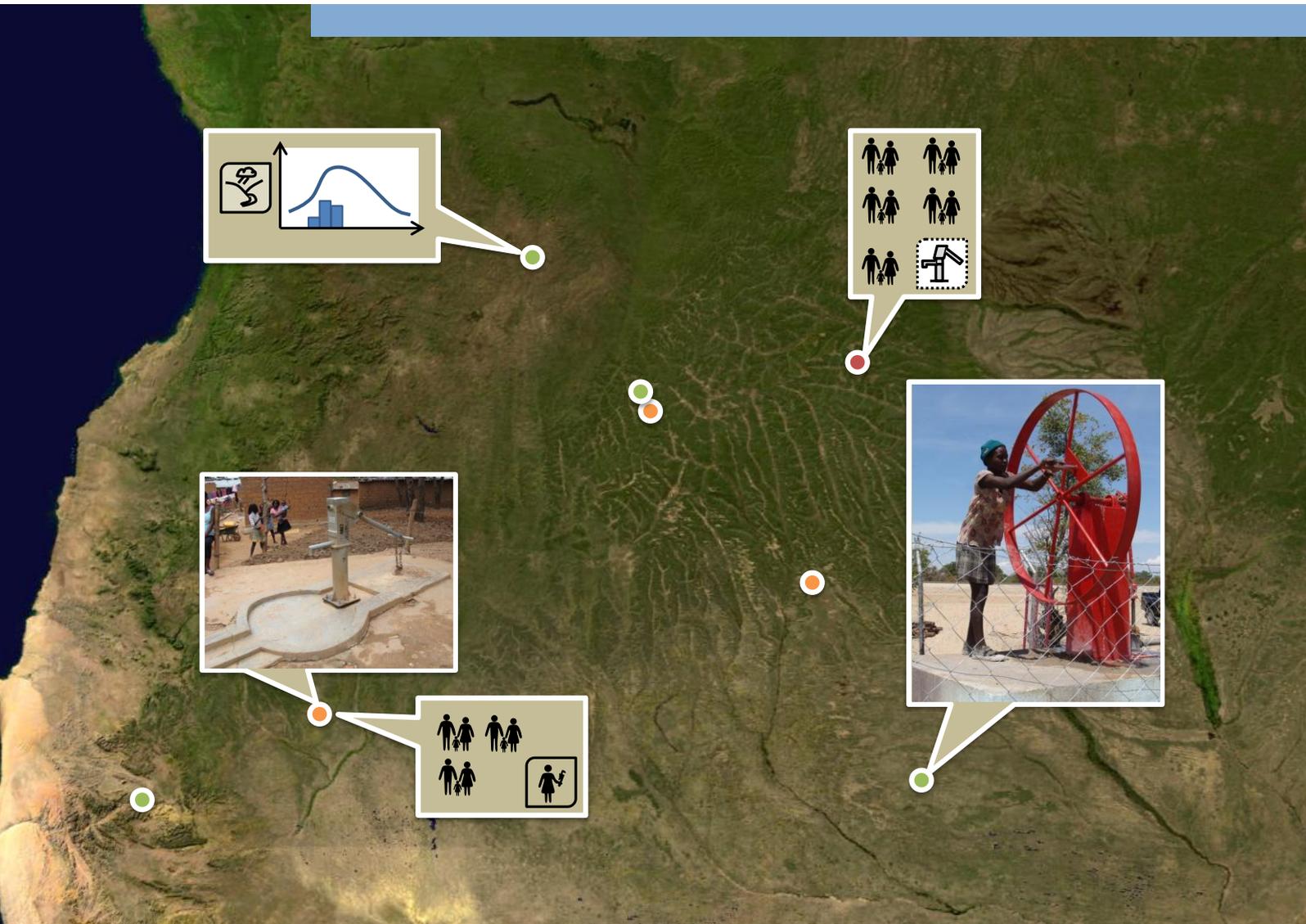
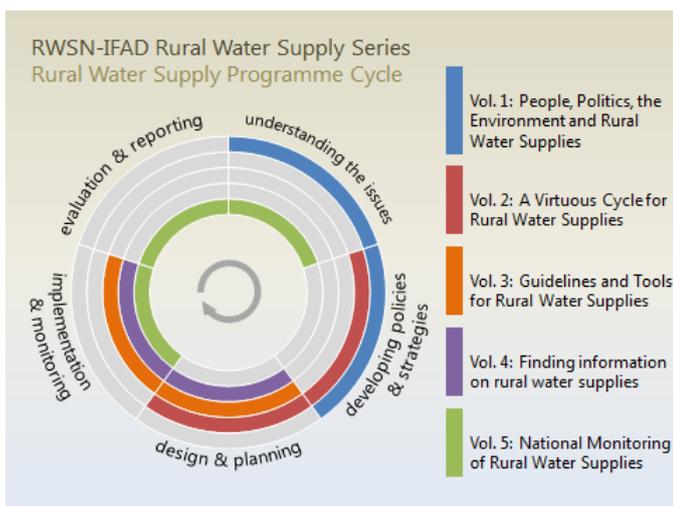


# Finding Information on Rural Water Supplies



## RWSN-IFAD Rural Water Supply Series

The Rural Water Supply Network (RWSN) and the International Fund for Agricultural Development (IFAD) have prepared a series of five publications which bring together the key aspects of rural water supply programming. Each volume is a stand-alone document, but as a set, they cover the programme cycle from understanding the issues right through to implementation and reporting (see figure below).



Volume 1: *People, Politics, the Environment and Rural Water Supplies* (RWSN 2012a) reflects on rural development, politics, environmental sustainability and how these relate to rural water supply services.

Volume 2: *A Virtuous Cycle for Rural Water Supplies* (RWSN 2012b) presents a variety of support and implementation aspects, from sector coordination to mapping and more, that can contribute towards sustainable rural water service delivery.

Volume 3: *Guidelines and tools for Rural Water Supplies* (RWSN 2012c) provides a structured annotated directory of over 40 useful guidelines and toolkits on rural water supplies.

Volume 4: *Finding information on rural water supplies* (RWSN 2012d) is an overview of current information sources with respect to access to water supply sources, the national context, the natural environment and finance.

Finally, Volume 5; *National Monitoring of Rural Water Supplies* (RWSN 2012e) documents experiences of national performance measurement for rural water supplies in Uganda and provides guidance for those interested in establishing such a comprehensive process in other countries.

### Abbreviations

DHS:	Demographic and Health Survey
JMP:	Joint Monitoring Programme (of the World Health Organisation and UNICEF)
NSDS:	National Service Delivery Survey
NHS:	National Household Survey
WASH:	Water, Sanitation and Hygiene

## Summary

If the world is to ensure that everyone has access to a safe and sustainable drinking water supply it requires reliable, up-to-date and well-organised information. It is needed so that what has been done already can be built upon and so that we can learn from what has gone wrong, avoiding duplication. Proper information supports decision-making.

A wealth of written material and data on rural drinking water supplies, from the informative to the inspirational is readily available. With advances of information technology and increasing levels of transparency, there are many open access databases. Easy to use, but powerful tools are available to generate graphs, charts and maps, which can help data analysis and enliven discussions. There are also several national and international conferences which pull together information on field experiences. However, selecting information from the internet is not always easy and one can be overwhelmed. Finding data in government offices can be challenging. Understanding who is doing what, or financing what can be a minefield.

This Rural Water Supply Network (RWSN) publication helps you to navigate the information out there on rural water supplies. It is for stakeholders who are new to rural water supplies, as well as others who are already knowledgeable of the topic, but would like a comprehensive overview of current information sources. This publication pulls together the main sources of information regarding rural water supplies coverage (and lack of coverage), implementation agencies and finance that exist in 2012. We also provide you with a starting point to find out more about water resources for rural water supplies.

The authors hope that the publication will provide you with information sources that can help you to better understand rural water supply service delivery. Please note that this publication does not discuss rural water supply technologies or provide links to implementation guidelines. For the first topic, we recommend the RWSN sister documents in this series Volume 1, (RWSN 2012a) and Volume 3 (RWSN 2012c) respectively.

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## 1 Introduction

It is already forty years since we managed to put one person on the moon, but we have still not managed to reach 650 million rural people with clean water. As Professor Richard Carter, the chair of the Rural Water Supply Network (RWSN), is fond of pointing out, enabling everyone to have access to a safe water supply close to their home is **more** than rocket science.

We want to make sure that everyone has access to sustainable rural water services. So what is needed? Good technology is one aspect, but the world needs much more than technology to ensure that even an elderly woman living in a remote Nepali village can drink safe water without having to walk 5km every day to collect it. For example, rural people also need skills to manage their water supplies, encouragement to deal with new technology, access to spare parts and support by local governments or other institutions in case of major problems. In turn, local governments depend on national governments for finance and policies. Likewise, many governments have to rely on external financial support. In fact, achieving access to sustainable rural water services requires that attention be paid to many pieces of a large jigsaw puzzle. Reliable, up-to-date and well organised information is crucial to solving this puzzle.

This publication helps you to find reliable and up-to-date information on rural water drinking water supplies. A wealth of written material and data is readily available, from the informative to the inspirational. Unfortunately, navigating all these sources can be daunting, and some sources are better organised than others. With this publication by your side, you can find information on access, national contexts, implementing organisations, water resources and finance, as well as technology use.

With the advances of information technology and increasing levels of transparency, there are also many open access databases. Useful tools can be found to generate graphs, charts and maps for analysis.

However, selecting information from the internet has been described as trying to take a drink from a fire hydrant (Thinkexist.com 2012). Many of us are overwhelmed with information. So much competes for our attention that it can be difficult to know what to prioritise, what to file for future reference and what to simply ignore. As new information continues to be published it can be difficult to stay up to date with advances and developments.

*“Know where to find the information and how to use it. That’s the secret of success”*

Albert Einstein

This RWSN publication pulls together the main sources of information regarding rural water supplies coverage (and lack of coverage), finance and water resources that exist today. It provides you with sources that can help you to better understand rural water supply service delivery. Please note that our focus is on **rural water** supply. There are other organisations who are working on sanitation and hygiene (e.g. the Sustainable Sanitation Alliance), and on urban water supplies (e.g. the International Network for Benchmarking Water and Sanitation – IBNET).

We write for rural water supply practitioners, professionals and researchers, whether working for Government, NGOs, the private sector, or for funding organisations. This publication should be useful for those who are new to the topic and those who would like to update their information sources. As we write in mid-2012, the authors are well aware that it will be out of date within a couple of years. We ask you to visit our website [www.rural-water-supply.net](http://www.rural-water-supply.net) for links to new information as it becomes available. We also ask that you inform us of other relevant information sources that we may have missed, or which are new, so that we can update the website and spread the news to others. Contact details are on the back page.

## 2 Demands and Requests by Water Users

*“Demand is an informed expression of desire for a particular service, measured by the contribution [that] people are willing and able to make to receive this service.”*

(Deverill et al., 2001)

One key approach in rural drinking water programmes over the last 20 years or so has been the demand-responsive approach, whereby people, such as residents in a village, express their demand for an improved water supply to a local authority, project or NGO. This demand is often made in the form of a letter, and in some cases, is accompanied by the payment of a cash contribution towards the capital cost.

Correspondence and records of applications for improved water supplies may be well organised and used for planning purposes or piled up in a dusty corner. Communities may also have records of their correspondence with local organisations.

Unfortunately organisations including local governments often receive more applications than they can deal with, given their limited means. However, what you find in their offices can be an invaluable insight into the local water supply context and user preferences. If you are involved in the planning of a new water supply programme or project, it is worth finding out what user demands have already been made through existing, or past processes.

With the advances in information technology, perhaps one day it will be possible for rural dwellers to have their demands and requests transparently available in the public domain for all to see. This is just a little idea for the future. It may be one way of accelerating the progress of access to safe drinking water for everyone.

### 3 Access to Rural Water Supplies

The RWSN-IFAD sister publication volume 1, *People, Politics, the Environment and Rural Water Supplies* (RWSN 2012a) provides definitions for rural. Box 1 summarises what we mean by *rural water supplies*, noting that definitions vary between countries and that the black and white distinctions between *improved* and *unimproved* water supply, although very powerful politically are not always helpful when it comes to the realities of implementation.

Some readers will be surprised to learn that there may be more than one official figure on access to an improved drinking water supply, or coverage (defined in Box 1). However, estimation methods are different between various organisations. National statistics offices, specific programmes or the ministry responsible for rural water supplies may use different methods and define things slightly differently. In this chapter, we explain some of the reasons for these differences, but, more importantly, point you to the data itself.

#### 3.1 Data from National Statistics

Statistics bureaus undertake the national census and other regular surveys, including the Demographic and Health Surveys (DHS), National Service Delivery Surveys (NSDS), National Household Surveys (NHS), National Family Health Surveys, Housing or Living Conditions Surveys<sup>1</sup> and the Multiple Indicator Cluster Surveys (MICS). The data is usually collected through questionnaires to representatively sampled individuals and households. The data from these surveys and publications provides invaluable insights into water supply access for rural as well as urban areas. e.g.:

- Box 2 presents an example of data on access<sup>2</sup> to improved water supplies for different *wealth quintiles* in Sierra Leone based on data collected in the Sierra Leone Demographic and Health Survey 2008. It shows that the lowest income quintile of the rural population have much lower access to an improved water supply than the highest income quintile. In fact the Joint Monitoring Programme (JMP 2012) showed that, while the higher income groups are gaining access, the lower income groups are being left behind.
- Figure 1 was generated from the Multiple Indicator Cluster Surveys data. It enables you to examine the urban-rural disparities in Central and Eastern Europe and the Commonwealth of Independent States with respect to *use* of an improved water supply.

#### Box 1: Improved Rural Water Supplies; Defining Access, Coverage and Use

The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) reports on progress towards achieving the MDG Water and Sanitation Targets. In the case of water supply, the proxy indicator used to measure progress is “the proportion of people that are using ‘improved’ drinking water sources, defined as those that, by the nature of their construction, are protected from outside contamination, particularly faecal matter” (JMP, 2012)

“Improved” drinking water sources refer to protected springs, boreholes, dug wells, piped water and rainwater harvesting facilities. Unprotected sources such as lakes, rivers and streams are considered as “unimproved”.

Most existing data relates to infrastructure that is either *improved* or *unimproved*. However, in reality, there are water supply sources which fall in between, or outside this black and white classification:

- Rainwater harvesting facilities, for example, are not considered as *improved* in every country
- Some supplies classified as *improved* may not actually be safe, due to contamination poor quality construction, inherent problems with of the water resource, such as arsenic in groundwater
- In some cases, water supplies classified as *unimproved*, may actually deliver safe water.

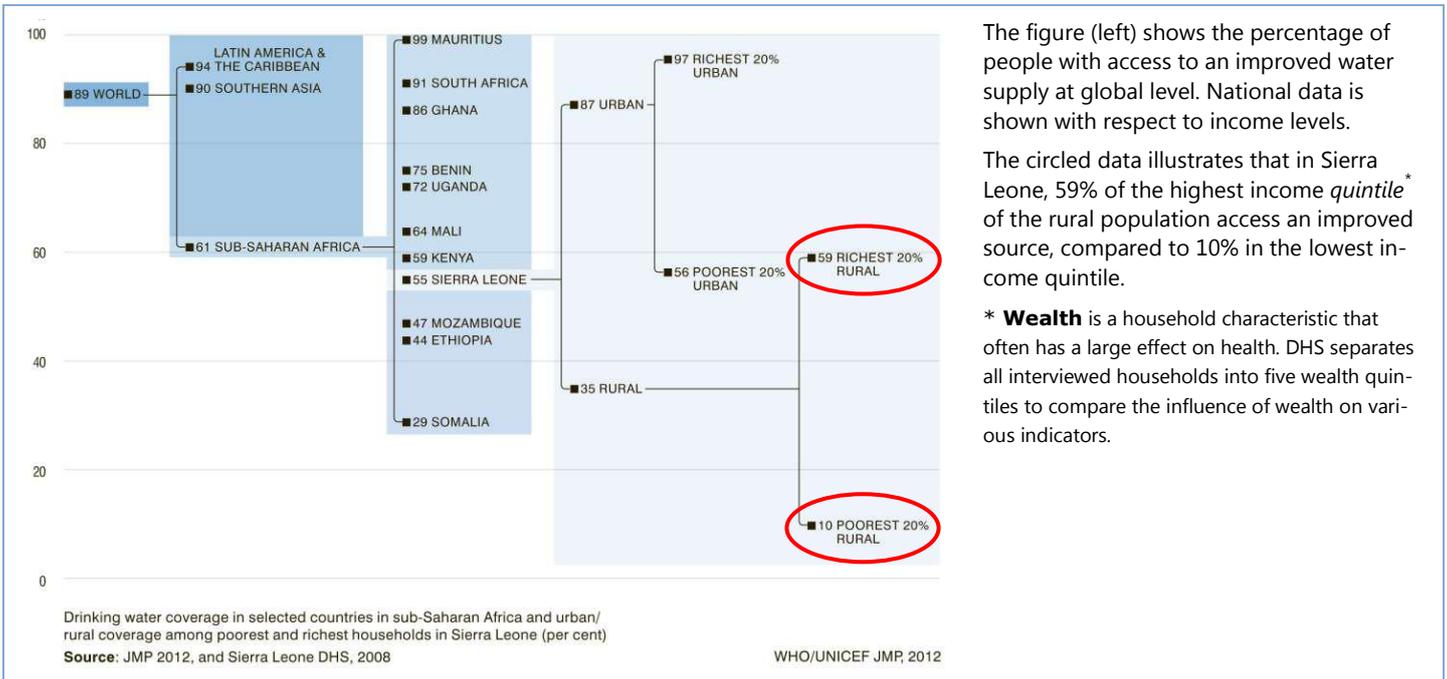
It may be possible for a supply classified as *unimproved* to be made better. For example, an open hand dug well can be covered, and later installed with a motorised pump with a small distribution system, transferring it from an *unimproved* to an *improved* supply. Such a step-wise improvement is encapsulated in the concept of service ladders. Incremental improvements are part of the Self-Supply concept, whereby people pay for the upgrading of their own water supplies, but may not reach the *improved* level in one full step (Sutton 2011).

With the exception of specific studies (Carter *et al.* 2005) there is a lack of detailed information on different types of *unimproved* water supply sources. However, this may change in the future as data collection and reporting mechanisms develop and become more refined.

The terms water supply access, coverage and use are quite distinct concepts, but are often used imprecisely in water supplies and WASH documentation:

- The term *coverage* refers to whether there is an improved water supply near a dwelling. In the case of rural areas, typically, countries have set standards for a maximum distance, such as 1km, or 1.5km. However, there may be cases that a person or household has coverage, but does not use the supply because they are excluded due to non-payment of for some other reason.
- Water Supply *use*: usually refers to whether a person or household actually utilises a particular water supply. In general, household surveys ask questions about water use.
- Water Supply *Access* is a term often used in the phrasing of national targets. In some publications, the term *access* is used interchangeably with the term *coverage* while in others it is used interchangeably with the term *use*. Within the Human Rights discourse, the term *access* has also been defined, alongside several other aspects of water supplies (Albuquerque & Roaf 2012).

**Box 2: Data on disparities in access to drinking water in Sierra Leone** (Source: JMP 2012)

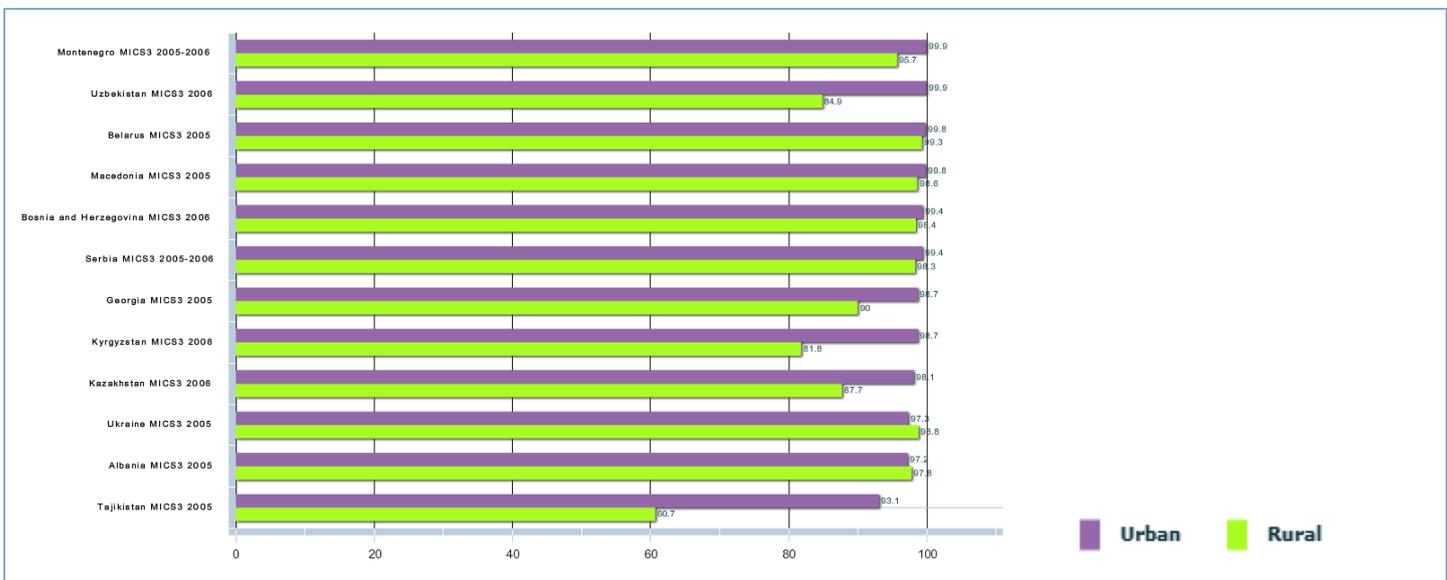


The figure (left) shows the percentage of people with access to an improved water supply at global level. National data is shown with respect to income levels.

The circled data illustrates that in Sierra Leone, 59% of the highest income *quintile*<sup>\*</sup> of the rural population access an improved source, compared to 10% in the lowest income quintile.

**\* Wealth** is a household characteristic that often has a large effect on health. DHS separates all interviewed households into five wealth quintiles to compare the influence of wealth on various indicators.

**Figure 1: Percentage of the population using an improved drinking water supply in rural and urban areas of countries in Central and Eastern Europe and the Commonwealth of Independent States** (Source: [www.micscompiler.org](http://www.micscompiler.org))



<sup>1</sup> An example data source is the World Bank’s “Living Standards Measurement Study”: [research.worldbank.org/lsm/lsmssurveyFinder.htm](http://research.worldbank.org/lsm/lsmssurveyFinder.htm)

<sup>2</sup> In this case, the term access is used in the JMP; however, it actually refers to water *use*, as it is taken from household surveys that ask questions about water use.

All DHS surveys should collect data on the type of source of drinking water, the time for collection, and whether and how it is treated before drinking. In some cases data may even be collected for different seasons. A number of surveys also ask who collects the drinking water, what the household source for non-drinking water is, and about water storage. Walking distances are available from some of these surveys, too. However, the measurement can be unreliable because it is based on estimation and memory, so instead collection time is often used as a proxy (Figure 2 is an example).

It should be noted that the national statistical data tends to be based on sampling, and is thus aggregated at regional or national level. It is usually not detailed for specific districts or villages. Increasingly, national statistics data are available on-line. As levels of transparency, as well as on-line tools are changing, it is worth keeping up-to-date with relevant statistics bureaus.

Data from some surveys is aggregated across countries, in particular:

- **Demographic and Health Surveys (DHS):** Information on drinking water source, time to water source, and water treatment, is available within DHS final reports within the 'Characteristics of Households' Chapter. All reports are available for free downloading from: [www.measuredhs.com](http://www.measuredhs.com). In addition, all DHS datasets are also available for free download on the MEASURE DHS website [measuredhs.com/data/available-datasets.cfm](http://measuredhs.com/data/available-datasets.cfm). Tables, charts and maps such as that shown in Figure 2 can be generated on [www.statcompiler.com](http://www.statcompiler.com)
- **Multiple Indicator Cluster Surveys (MICS)** reports can be accessed through the UNICEF website [www.unicef.org/statistics](http://www.unicef.org/statistics). Tables, charts and maps such as that shown in Figure 1 can also be generated from this data on [www.mics\\_compiler.org](http://www.mics_compiler.org). Water supply data can be found in the *Environment* section of the same website.

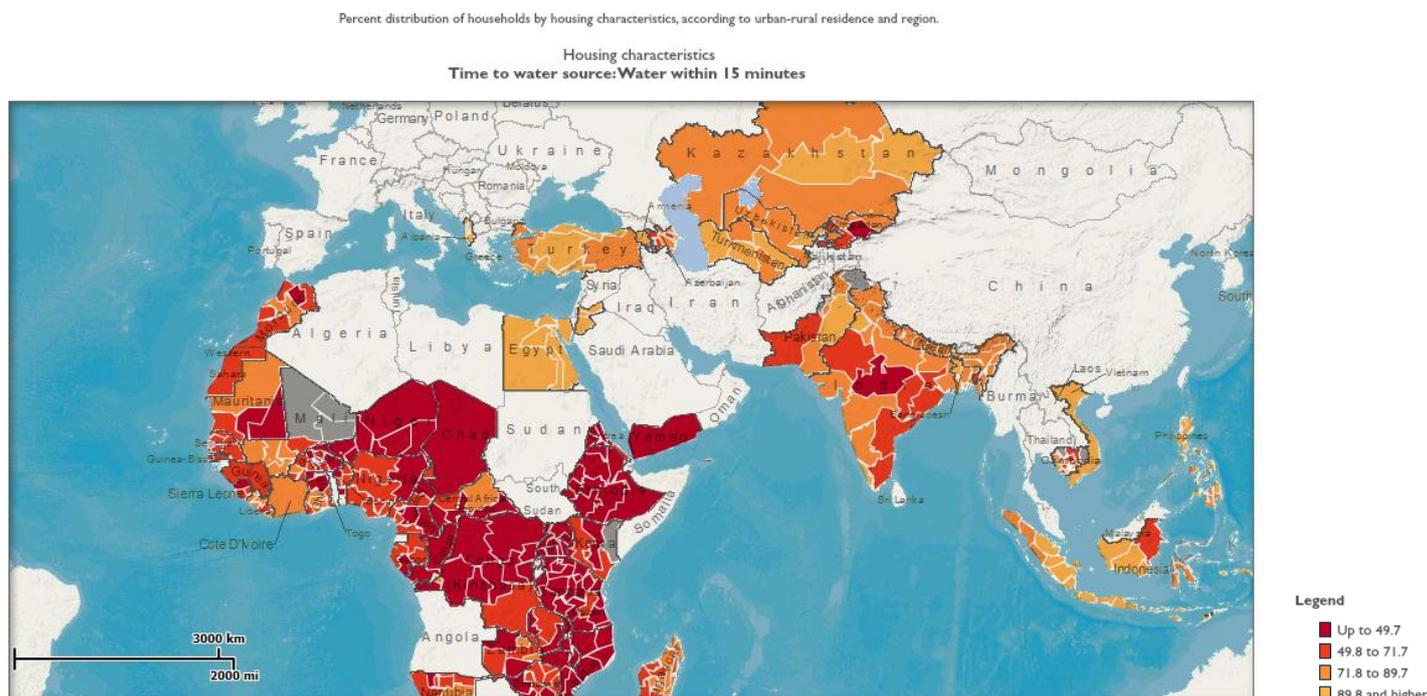
International data on access to an improved water source is essentially a compilation of national data from different surveys and questionnaires. The Joint Monitoring Programme (JMP) of UNICEF and the World Health Organisation provides global, regional and national statistics on populations' access to improved drinking water sources. The JMP data and analysis is used extensively in regional (multi-country) and international dialogue and advocacy. A comprehensive report is produced every two years, with occasional thematic reports also produced. Further information regarding the JMP can be found on [www.wssinfo.org](http://www.wssinfo.org).

There are a number of standard publications at national level, such as Millennium Development Goals Country Reports, that also provide water supply data and some analysis. However, they too tend to draw on existing data sources such as national surveys.

### 3.2 Data from National Inventories, Asset Registers or Water Point Mapping

The line ministry responsible for rural water supply, for example, the Ministry of Water and Energy, Ministry of Rural Development or Health Ministry may have an inventory of rural water supply facilities that have been constructed. Such data is usually used to estimate water supply access by counting each improved water supply, such as a communal tap or handpump and multiplying it by an assumed number of users. However, detailed information on when these fixed assets were constructed, where they are, their condition, and cost implications for long-term maintenance is often lacking (IRC 2011). In cases where inventories, or asset registers exist, it is important to find out when and how they are updated as it may be limited.

**Figure 2: Percentage of households per region who can access water within 15 km of the home** (Source: <http://www.statcompiler.com>)



Water point mapping is an inventory of water points that combines data on individual water points with a map of their locations (RWSC 2011). The rapid spread of mobile phones and network coverage, cheaper Global Positioning Systems (GPS) and smart phone that include GPS functions has increased the ease and attractiveness of water point mapping. Box 3 shows an extract of a recent inventory, with maps undertaken in Uganda. There are also interesting examples of water point mapping being used in Liberia [www.wash-liberia.org](http://www.wash-liberia.org), (Hirn 2011a and Hirn 2011b) and Sierra Leone [www.sl-wash.org](http://www.sl-wash.org). This is a rapidly growing area with a lot of developments and as we go to press we know that there are other initiatives in Swaziland, the Democratic Republic of Congo, Zambia, Ethiopia, Tanzania, Ghana, Kenya, Brazil and Zambia (RWSN 2012f).

Various software and tools for water point mapping, such as Water Point Mapper (example in Box 4, [www.waterpoint-mapper.org](http://www.waterpoint-mapper.org)) and FLOW [www.akvo.org/web/introducing-akvo-flow](http://www.akvo.org/web/introducing-akvo-flow), as well as other products are on the market. A discussion on the different functions, techniques, as well as their life-cycle costs, is beyond the scope of this publication, but if you want to learn more about the technology and its potential, visit the World Bank Site [water.worldbank.org/node/84034](http://water.worldbank.org/node/84034), and read the recent review undertaken by the Pacific Institute [www.pacinst.org/reports/mwash/full\\_report.pdf](http://www.pacinst.org/reports/mwash/full_report.pdf).

Alternatively you may consider joining the RWSN water point mapping community. As this publication went to press, a very lively exchange between people with experience of mapping technologies, update of data and use of the information was taking place.

### 3.3 Project and Programme Data

Projects or programmes, whether funded by a bilateral or multi-lateral agency or an NGO, usually collate data on the water supply facilities that they have built, improved or maintained. Unfortunately, there is a tendency for the information to exclude infrastructure built as a result of other projects or before the project started. Nevertheless, the data available can be very rich, particularly with respect to local management structures and even the actual number of users per source. However, the challenge is that such data does not tend to be readily available in the public domain and so considerable time and energy may be required to contact the relevant organisations and obtain the data. Once the programme ends, such data may be lost forever if there is no good handover mechanism or if the government is not ready and able to archive the information.

### 3.4 Local Government Data

Local governments and NGOs may also collect and store information on water supplies, including functionality and management. Such data is essential for planning, resource allocation and the provision of on-going support to communities once construction has been completed. Box 4 provides an example in Rwanda of where such information is collected and used. International NGOs, such as SNV and WaterAid have been supporting local governments with mapping water supplies and populations over the past five years or so (see section 3.2 on Water Point Mapping).

#### Box 3: Extract from the Uganda Water Supply Atlas (MWE 2010)

The Ugandan Water Supply Atlas "has been prepared to provide stakeholders with good knowledge and information on matters concerning the safe water supply coverage, functionality and distribution. The Water Supply Atlas files are presented as a national report and one report per district. The national report is divided into Introduction, Explanatory notes and National summary report. The baseline survey was carried out in 2009/2010 and published in February 2011". The map below shows water source distribution in Amuria District.

*"Amuria District is located in the northern part of the Eastern Region of Uganda and forms part of the Teso sub-region. The district population is 344,200 of which 58 % has access to safe water. The access rates vary from 42 % in Acowa Sub-County to 95 % in Kapelebyong Sub-County. The functionality rate in urban and rural areas is 82 % and 86 % respectively".*



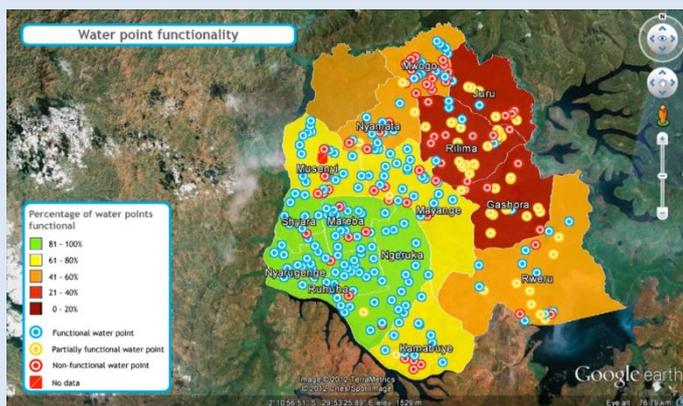
Unfortunately, national inventories (described in section 3.2) are not always available locally, so it is worth cross-checking with the Ministry responsible for rural water supply, or health, as well as the national statistics bureau. Sometimes inventories are out of date, but can still provide a good basis for discussion.

Local government extension staff such as health, agricultural and community development officers have a wealth of information about the water supply situation in their heads and notes. Using maps and existing information, or participatory techniques such as discussions with local leaders, technical staff and different support organisations can help to draw out key information. This can be used to determine where, and for whom to focus efforts. Information on the functionality of water supplies can also help to target support. RWSN has established an interest group on water point mapping [next.dgroups.org/rwsn/mapping](http://next.dgroups.org/rwsn/mapping) for those who would like to share their experiences on this topic.

Where no data is available to inform decision-making it may be worth trying to provide support in this regard. This can reap long-term benefits. However, it is vital to find out about, and link up with national initiatives so that the information can be fed into national databases and information collection for monitoring and evaluation.

#### Box 4: District Water Supply Map in Rwanda

In early 2012, the Bugesera District Government in Central Rwanda appointed the first District WASH Coordinator, responsible for the coordination of water supply and sanitation interventions across 15 sub-districts. Unfortunately, there was a distinct lack of data. WaterAid Rwanda, supported the District WASH Coordinator to undertake an inventory of all improved community water supply facilities across the 15 sub-districts. The mayor of Bugesera participated in the training of local data collectors and actively promoted the activity.



Information was recorded using Global Positioning System (GPS) devices and A4 paper data sheets. The WASH Coordinator then assembled the information and used a tool called the Water Point Mapper [www.waterpointmapper.org](http://www.waterpointmapper.org) for the analysis. The results were illuminating. The analysis shows the functionality of water points within the administrative boundaries of the district. Between 41-60% of the water points were functioning at the time of data collection. However, whilst some areas show high levels of water point functionality, others are worse off (figure above).

The WASH Coordinator is currently using a combination of functionality and coverage maps to plan the rehabilitation of existing

services, and the development of new community water supply facilities. The maps enable a rapid assessment of areas with high populations and low access to improved water supplies. The District WASH Coordinator Samuel Ruzindana said *"the maps we generated are to help the planners, decision makers and district development partners to know where exactly to intervene in water provision, rehabilitation of water points that are no longer functioning and installation of new water point sources where they have never been, depending on the need and urgency. It also helps in day to day monitoring of water sources functionality. This helps to ensure sustainability."*

### 3.5 Data Management and presentation

The topic of storing, analysing and using data is worthy of an additional publication. However, it is perhaps worth highlighting one existing tool for storing and analysing data which is available free of charge on the internet. DevInfo is a free, downloadable database system for monitoring human development, and can be found on [www.devinfo.org](http://www.devinfo.org). It is endorsed by the United Nations Development Group to assist countries in monitoring progress towards the Millennium Development Goals. The software uses data such as from the MICS, DHS and national censuses (described in section 3.1), or other national and programme data. It facilitates the presentation of disaggregated data in tables, graphs and charts, allowing gaps and disparities to be easily identified. Visually, the presentation is extremely powerful. The DevInfo website provides training packages including a tool for monitoring equity in water and sanitation programming developed with the Water Supply and Sanitation Collaborative Council (Thapar *et al.*, 2011). This has been used effectively by UNICEF to monitor equity and performance in rural water supply in Bolivia.

## 4 National Context and "Who is doing what?"

### 4.1 Collaboration and Joint Reporting Mechanisms

There is a trend towards collaboration and joint planning between National Governments, *development partners* and NGOs. Several countries have established National Working Groups or round tables. Water and Sanitation NGOs often establish national networks (Table 2) and development partners may have their own coordination groups within a particular country. Annual joint reviews of progress in water and sanitation may be held and national *Annual Sector Performance Reports* or *National Water Supply and Sanitation Reports* are being prepared in some countries. These reports are particularly useful as they usually set out the legal and institutional framework and provide an overview of progress and challenges. Such information is invaluable, whatever type of work an organisation plans to do.

Some countries have made these reports available electronically via the Government, or the responsible line Ministry website. It is worth noting that the quality and quantity of information in these reports tends to change over time so it is worth keeping up to date with the latest editions.

## 4.2 Policies and Institutions

It is not always easy to find information regarding specific government policies, or the institutional framework. Although they are not always available electronically, they can usually be found in Ministry libraries or government bookshops if they exist.

International, or regional declarations that set out government commitments to financing and improving water supply and sanitation are a useful starting point for information, as some are being monitored to a certain extent. Such agreements include the *Sharm El Sheikh Commitments for Accelerating the Achievement of Water and Sanitation Goals in Africa* (AU 2008) and, in the case of Sanitation, the *Ethekwini declaration and AfricaSan Action Plan* (AfricaSan 2008). Examples of such monitoring include:

- **WASHwatch** [www.washwatch.org](http://www.washwatch.org), an online platform for Civil Society Organisations to monitor government's performance against their policy and financial commitments for water supply, sanitation and hygiene (WASH). Any organisation working in the sector which has an opinion about its government's performance is invited to share it for the benefit of all. Those with additional data are requested to contribute this information to the site. Over time this will improve the transparency and cross-country comparability of some of the hard to uncover elements of the WASH sector – ministry plans and policies, budget allocations and legislative changes.

The international human rights framework can also provide useful information on country policies and political commitments:

- A list of government signatories of human rights treaties including those containing rights to water and sanitation can be found on the website of the **Office of the United Nations High Commissioner for Human Rights** (Table 1).
- **WaterLex** have set up an online Legal Database (Table 1) which contains dozens of International and National Legal documents that comply with the human right to water and sanitation. It includes national constitutions, water policies, statutes, strategies as well as details of convention signatories, although currently not in their original languages.
- The **Freshwater Action Network (FAN)** comprises national and regional networks and provides a useful starting point for regarding the organisations collecting testimonies of violations of rights to water and sanitation at international and national levels (Table 7).

**Table 1: Rights to water and sanitation and Legal provisions**

Organisation	Website
Fighting hunger with human rights	<a href="http://www.fian.org/programs-and-campaigns/inicio_seccion">www.fian.org/programs-and-campaigns/inicio_seccion</a>
Office of the United Nations High Commissioner for Human Rights	<a href="http://www2.ohchr.org/english/law/">www2.ohchr.org/english/law/</a>
Right to water (information portal)	<a href="http://www.righttowater.info">www.righttowater.info</a>
Special Rapporteur on the human right to safe drinking water and sanitation	<a href="http://www.ohchr.org/EN/Issues/WaterAndSanitation/SRWater/Pages/SRWaterIndex.aspx">www.ohchr.org/EN/Issues/WaterAndSanitation/SRWater/Pages/SRWaterIndex.aspx</a>
Waterlex Legal Database	<a href="http://www.waterlex.org/waterlex/resources/online-legal-database">www.waterlex.org/waterlex/resources/online-legal-database</a>

The **WASH in schools** project [www.washinschools.info](http://www.washinschools.info) maps policy and practice in school WASH services in several countries providing an overview of institutional challenges and current initiatives regarding water and sanitation for schools. The summary of the policy environment for each country case is relevant not only to WASH in school services but often to the water supply sector as a whole.

## 4.3 Status of Water Supply Development

The County Status Overview (CSO) (WSP 2010) reports provide insights into the status of water and sanitation development for over 30 countries, with more underway. These reports exist for countries that have their own National Water Supply and Sanitation Reports (section 4.1) as well as those without. The County Status Overview reports identify trends and challenges, and set the stage for prioritising actions (Box 5). They form a very useful guide for external agencies as they consider which areas need particular support, and which aspects of the sector are especially strong.

The UN-Water Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS 2012) published by WHO and UN-Water provides a snapshot of indicators (for 74 countries in four regions) and also identifies bottlenecks in financial flows, policy frameworks, institutional arrangements and the human resource base at the national level and district. There is considerable overlap between the GLAAS and Country Status Overviews. The GLAAS, which is based on a questionnaire, is limited in terms of in-depth analysis, but covers considerably more countries than the CSO reports.

In cases where no succinct overview exists, information may have to be collected first hand, through interviews, as well as existing project and programme documentation. However, the County Status Overviews as well as the GLAAS provide a possible structure for the information.

The Africa Infrastructure Country Diagnostic (AICD) collected data on network service infrastructure, including water & sanitation 2001 to 2006 in 24 selected African countries [www.infrastructureafrica.org](http://www.infrastructureafrica.org). It includes substantiated estimates of spending needs, funding gaps, and the potential gains to be derived from policy reforms.

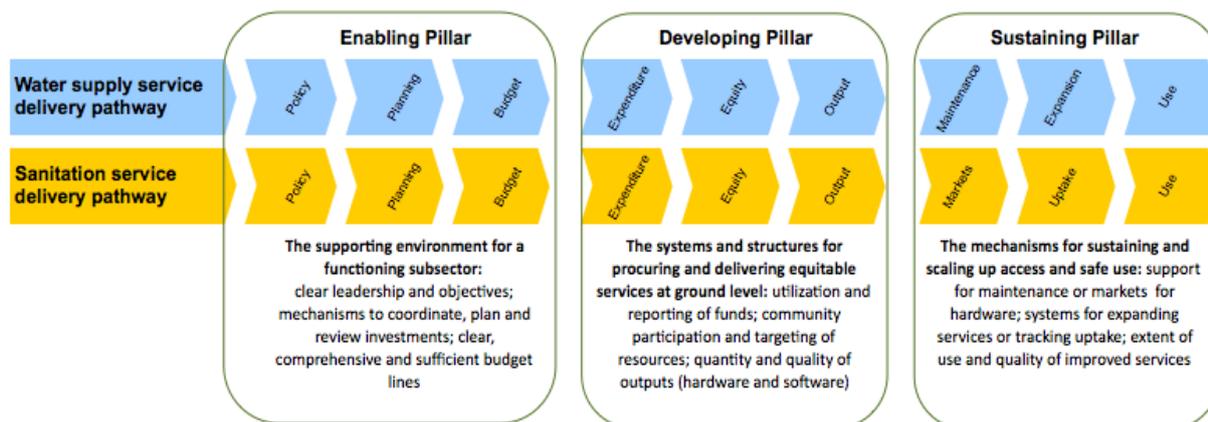
## 4.4 Who is doing what?

Unless there is a national annual report for the entire country, such as Uganda's Sector Performance Measurement Report (described in RWSN 2012e) or some sort of coordination body it is very difficult to determine who is implementing or supporting which projects and programmes in a particular country. There are thousands of organisations working on and financing rural water supply projects around the world and unfortunately there appears to be considerable duplication.

To understand who is doing what, with respect to rural water supplies, and in which part of the country, the first port of call should be the line ministry responsible for rural water supplies, water resources or health. However, where organisations implementing projects or undertaking research bypass Government and do not inform them of what they are doing, where

**Box 5: Understanding Service Delivery using the Country Status Overviews**

The Country Status Overview (CSO) reports provide a comprehensive analysis of water supply and sanitation service delivery for over 30 countries (see map on right). In 2012, more CSOs were being undertaken in other countries. The CSOs examine water supply and sanitation service delivery for a particular country using an assessment tool called the **CSO2 scorecard**. The emphasis of the CSO is on the strength of Government systems. The scorecard looks at nine building blocks along the *service delivery* pathway. These nine building blocks are grouped into three pillars as follows:



Each of the nine building blocks has been assessed against specific indicators and scored from 1 (poor) to 3 (excellent) accordingly. The scoring has been undertaken for Rural Water Supplies, Urban Water Supplies, Rural Sanitation and Urban Sanitation. The results of the score card show visually the aspects where the country is performing well as well as bottlenecks. The CSOs also present consolidated information on funding requirements and financial gaps for capital as well as operating expenses. Each CSO country report is 36 pages long, and provides a wealth of analysis on the legal and institutional developments of the past, up to today, together with strengths and weaknesses. The CSO is a must-read for anyone planning, or already working in rural or urban water supplies and sanitation in a particular country. The glossary in *Making a Difference in Rural Water Supplies* should help readers who are unfamiliar with some of the jargon used in the CSOs.

CSOs can be downloaded from the Water and Sanitation Programme (WSP) website on [www.wsp.org/wsp/content/pathways-progress-status-water-and-sanitation-africa](http://www.wsp.org/wsp/content/pathways-progress-status-water-and-sanitation-africa)

reporting mechanisms are weak or where data is not well consolidated, the Ministry will not be able to provide a comprehensive picture. Other ministries (e.g. office of the Prime Minister or President) may also run water supply projects, without informing the main line ministry. Sadly information is not always shared systematically between all stakeholders. The only long term solution to this problem is through effective regulation or a national coordination mechanism such as a national working group (see RWSN 2012e), Monitoring the Performance of Rural Water Supplies). Supporting such an endeavour over the long term is one way to really make a difference in a country and may have a more significant impact over several years than constructing a few water facilities.

Ironically, it can often be easier to find out about particular small initiatives, serving even just one particular village or community, than about large programmes, including those at national scale. Thus, at this stage, the authors present a rather unsatisfactory list of information sources that can be used to build up a picture of who is doing what.

Information can be sought from newsletters (Table 2), events (Table 3), finance organisations (Table 4) networks (Table 7) and information hubs (Table 8). One useful starting point to find out which international organisations are extensively supporting rural water supplies is the list of organisations that attended the 6<sup>th</sup> RWSN Forum in Kampala in 2011 [rwsnforum.wordpress.com/confirmed-delegates](http://rwsnforum.wordpress.com/confirmed-delegates), the various national NGO Networks, the OECD data on finance and other funding websites (section

6.2). The 6<sup>th</sup> World Water Forum in Marseille in 2012 has an online platform, with over 100 'solutions' for rural water supplies [www.solutionsforwater.org](http://www.solutionsforwater.org). The summary rural water supplies paper from this event (Danert, 2012) is also a useful source of information on implementation.

**Table 2: Select Newsletters and blogs with information on Rural Water Supplies Implementation**

Newsletter	Website
ACCESS (WSP)	<a href="http://www.wsp.org/wsp/newsletter/all">www.wsp.org/wsp/newsletter/all</a>
International Network on Household Water Treatment & Safe Storage	<a href="http://waterinstitute.unc.edu/hwts/">waterinstitute.unc.edu/hwts/</a>
International Rainwater Harvesting Alliance	<a href="http://www.irha-h2o.org">www.irha-h2o.org</a>
Multiple Use Systems	<a href="http://www.musgroup.net">www.musgroup.net</a>
PS-eau	<a href="http://www.pseau.org">www.pseau.org</a>
Rural Water Supply Network (RWSN)	<a href="http://www.rural-water-supplies.net">www.rural-water-supplies.net</a>
Source (IRC)	<a href="http://www.source.irc.nl">www.source.irc.nl</a>
WASHplus (USAID)	<a href="http://www.washplus.org">www.washplus.org</a>
Water services that last	<a href="http://www.waterservicesthatlast.org">www.waterservicesthatlast.org</a>
WaterSan Perspective	<a href="http://waterjournalistsafrica.wordpress.com">waterjournalistsafrica.wordpress.com</a>
WaterWired (Oregon State University)	<a href="http://aquadoc.typepad.com/waterwired">aquadoc.typepad.com/waterwired</a>

**Table 3: Select Events which explicitly include Rural Water Supplies**

Key National and International Events	Details
Africa Water Week (annual since 2009)	<a href="http://www.africawaterweek.com">www.africawaterweek.com</a>
Aguasán (annual since 1995)	<a href="http://www.aguasan.ch">www.aguasan.ch</a>
International Water Association World Water Congress & Exhibition (annually since 2010)	<a href="http://www.iwahq.org">www.iwahq.org</a>
IRC Symposium (every 2 years since )	<a href="http://www.source.irc.nl/page/71577">www.source.irc.nl/page/71577</a>
Joint Sector Review (annually in many countries)	Lead ministry website, GLAAS, County Status Overviews
RWSN Forum (every 3 to 5 years since 1992)	<a href="http://www.rural-water-supply.net/en/knowledge-networking-advocacy">www.rural-water-supply.net/en/knowledge-networking-advocacy</a>
See <a href="http://washcalendar.wordpress.com">washcalendar.wordpress.com</a> for details of more events	
Water and Health Conference (annually since 2010)	<a href="http://whconference.unc.edu">whconference.unc.edu</a>
WEDC conference (annual since 1973)	<a href="http://www.wedcconference.co.uk">www.wedcconference.co.uk</a>
World Water Forum (every three years since 1997)	<a href="http://www.worldwatercouncil.org">www.worldwatercouncil.org</a>
World Water Week in Stockholm (annual)	<a href="http://www.worldwaterweek.org">www.worldwaterweek.org</a>

Given the relatively few multi-lateral and bilateral development partners that provide extensive funding for rural water supplies [stats.oecd.org](http://stats.oecd.org), it is worth initially finding out whether they are operating within the country in question, and whether a donor coordination group has been established. Online information is also improving, and several countries have established partnerships or forums that bring together different stakeholders (NGO and private sector), e.g.:

- WASHfund.org have an interactive online map that shows where some major grant and OECD funding is happening in different countries and by whom [washfund.org/Funding-Map](http://washfund.org/Funding-Map).
- The Swiss Agency for Development and Cooperation has a dedicated website to all of its water activities and projects [www.sdc-water.ch/en/Home](http://www.sdc-water.ch/en/Home).
- There is a website of Dutch supported water supply implementation organisations, with considerable project information [www.dutchwatersector.com](http://www.dutchwatersector.com)

Table lists the main banks and facilities which publish considerable project-specific, regional and topical reports that address rural water supply. In addition, project design documentation available on their websites often contains succinct sector or sub-sector descriptions, cost data, an overview of key issues, policy and legal analysis and more. These project documents typically include a list of references that lead to other reference materials. InterAction has an easy-to-use interactive map of projects implemented by its over 40 member international NGOs [foodsecurity.ngoaidmap.org/sectors/13](http://foodsecurity.ngoaidmap.org/sectors/13)

**Table 4: Key finance organisations with rural water supply project, regional and topical reports**

Organisation	Website
African Development Bank	<a href="http://www.afdb.org">www.afdb.org</a>
Asian Development Bank	<a href="http://www.adb.org">www.adb.org</a>
EU Water Facility	<a href="http://ec.europa.eu/europeaid/water-facility">ec.europa.eu/europeaid/water-facility</a>
Inter-American Development Bank	<a href="http://www.iadb.org">www.iadb.org</a>
Water and Sanitation Programme	<a href="http://www.wsp.org/wsp">www.wsp.org/wsp</a>
World Bank	<a href="http://www.worldbank.org/reference">www.worldbank.org/reference</a>

Numerous Government, project, NGO and *development partner* annual reports, evaluation reports, academic research, studies, consultancy, appraisal and project completion reports also exist for rural water supply in most countries. The challenge is that these reports are rarely all available in one place and can vary in terms of quality and reliability. Some organisations provide a consolidated annual report, e.g. UNICEF [www.unicef.org/wash](http://www.unicef.org/wash).

NGOs are increasing their online reporting (Figure 3), and there is more emphasis on learning from failure as well as from success [www.admittingfailure.com](http://www.admittingfailure.com). In addition, projects are being implemented by the private sector, often as part of their Corporate Social Responsibility (CSR) programmes [wateractionhub.org](http://wateractionhub.org).

**Figure 3: A prototype online reporting tool by Water For People [www.waterreportingplatform.org](http://www.waterreportingplatform.org)**

While there is a considerable wealth of information on the internet not everything is in the public domain. Locating the individual within Government, a supporting organisation, or the private sector who has access to reports and will readily pass them on is invaluable.

## 5 Rural Water Supply Finance and Costing

Urban areas receive more than twice as much aid for water and sanitation compared to rural areas, despite the fact that five out of six of the un-served are rural dwellers

(JMP 2012)

### 5.1 Water Supply Financing

The so-called water-financing model comprises the *3Ts*: Tariffs, Taxes and Transfers, together with *levers* (such as guarantees or insurance) and *repayable funds* (such as loans or equity investments). Ideally, tariff revenues are supposed to be the main income source and in many parts of the world may be sufficient to cover operational costs. A significant part of the total costs (which includes finance of the capital investment) may come from taxes (local taxes or transfer from national budget) and transfers (funds from international donors and charitable foundations that typically come from sources external to the country). Key elements of water-finance are sustainable cost recovery, transparent public subsidies and local finance (EUWI 2011).

Public policies need to decide whether the tariff income should cover full costs. Strategic financial planning is one approach, a process whereby national consensus is built concerning who should pay for what in the long term. The pros and cons of different approaches are beyond the scope of this publication, which focuses on information sources. However, it should be noted that it has been recognised that full cost recovery is unlikely in most poor rural communities (Harvey 2007). It is necessary to strike a careful balance between the level of water service and the cost, so that community needs are met and coupled with their ability to pay and long-term subsidy options. In the case of the Self Supply approach, households themselves pay the full cost of the infrastructure and all maintenance. However, water source improvements are generally undertaken in incremental and affordable steps, or by households accessing credit in the form of micro-finance or revolving loans.

For readers who would like to know more about water-financing in general, the EU Water Initiative (EUWI 2011) primer on "*financing for water and sanitation*" is particularly accessible for those with non-technical backgrounds. The background report of the 6<sup>th</sup> World Water Forum on "*financing local water and sanitation stakeholders*" (SIE & AFD 2011) is up-to-date, and provides a very comprehensive picture of the status-quo, promising solutions for finance from different parts of the world as well as recommended actions.

Other useful reading material is "*Managing Water for All*" published for the 5th World Water Forum in Istanbul (OECD 2009), OECD (2011), and while the instrumental work of Camdessus (Winpenny 2003) and Gurria (Van Hofwegen 2006). Hutton and Bartram (2008), SDC (2008) and WaterAid (2008) will soon start to become a little out of date, the authors do present slightly different perspectives, covering global, regional national and more local levels. It is also worth knowing that several international organisations such as the United Nations Environmental Programme, the EU Water Initiative, the World Water Council and the Global Water Partnership among others have established finance working groups.

### 5.2 Who is financing?

Countries, multilateral organisations, NGOs and private foundations all provide External Development Assistance (i.e. Transfers) for rural water supplies. Data on development finance from Development Assistance Committee (DAC) member countries and others (Box 6) is available from the Organisation for Economic Co-operation and Development Creditor Reporting System [stats.oecd.org](http://stats.oecd.org). A recent feature of this data is that different aid modalities can be distinguished, i.e. projects, sector budget support, technical assistance, specific programmes managed by international organisations, and basket funds. The OECD website also provides detailed project-level data for researchers. Table 5 provides several other useful publications and links for funding organisations focusing on rural water supply, and WASH.

**Table 5: Key Resources for Rural Water Supply Funders**

Resource	Website
<b>A funder journey: Scaling up the Stone Family Foundation</b> - a case study of setting up a WASH charitable trust (free registration required to download report)	<a href="http://www.philanthropycapital.org">www.philanthropycapital.org</a>
<b>Funding for NGOs</b> - fundsforngos.org is an online initiative, working for the sustainability of NGOs by increasing their access to donors, resources, and skills.	<a href="http://www.fundsforngos.org">www.fundsforngos.org</a>
<b>Sanitation and Water for All (SWA)</b> is a partnership of governments, donors, civil society and multilateral organisations. Its aim is to ensure that all people have access to basic sanitation and safe drinking water.	<a href="http://www.sanitationandwaterforall.org">www.sanitationandwaterforall.org</a>
<b>WASHfund.org</b> - a "one stop shop" for funding and needs-related data and information for donors, policymakers, and other stakeholders interested in water, sanitation, and hygiene.	<a href="http://washfund.org">washfund.org</a>
Investment in water and sanitation with private participation - World Bank data map	<a href="http://data.worldbank.org/indicator/IE.PPI.WATR.CD?display=map">data.worldbank.org/indicator/IE.PPI.WATR.CD?display=map</a>

#### Box 6: Water Supply Finance (OECD 2012; OECD 2011b)

Aid commitments\* to water and sanitation amounted to US\$ 8.3 billion in 2009/10, with Japan, Germany and France as the largest bilateral financiers. Sub-Saharan Africa and South and Central Asia received 26% and 21% of water and sanitation aid respectively in this period. Interestingly 46% of funds went to ten countries, and concessional loans (rather than grants) financed more than half of water and sanitation investments in 2009/10.

One of the weaknesses of the OECD data is that rural water supply is not explicitly defined. The term "Basic systems" covers technologies applied in rural schemes using handpumps, spring catchment, gravity-fed systems, rain water collection and fog harvesting, storage tanks and small distribution systems. However, it also includes urban schemes using handpumps and local neighbourhood networks including those with shared connections (OECD, 2011b). Between 2008 and 2010, aid for basic sanitation and drinking water services increased from 16% to 26% of overall commitments, however it is noted that there are some discrepancies in the application of the codes.

\* Commitments, including multi-annual agreements, are recorded by the OECD in the year that they are signed, with corresponding disbursements spread out over several subsequent years.

National reports (see section 4.1 and 4.2), the Country Status Overview (Box 5) and specific studies, such as that by WaterAid (2011) set out Government finance. The GLAAS (2012) report undertakes some analysis of sector finance, including country prioritisation of water. It draws on OECD data as well as data from its own questionnaires. The World Bank expenditure reviews also provide reliable information on in-country finance, but they are not undertaken very often.

### 5.3 Water Supplies Costing and Finance

*"It is estimated that about US\$ 18 billion per year is needed to expand water services in developing countries to achieve the water and sanitation Millennium Development Goals. To maintain the existing water infrastructure, another US\$ 54 billion of investments are needed"* (OECD 2011). At first glance this sounds like a fairly simple statement. In fact, it is built on substantial data and a series of assumptions.

Calculating the full cost of rural water services can be complicated. Understanding the cost is important for planning and monitoring. Costing methods and data sources, as well as estimates, do exist, but caution is required. Some reports do not distinguish between the cost and the price of a service or job. Ideally, cost should refer to what is actually spent to provide the service, whereas price should refer to what the user, or consumer pays, or what a contractor charges. Estimates, such as budgets and bills of quantities, usually differ considerably from actual costs. Unfortunately, basic information on the cost of different interventions in drinking water (and sanitation) is lacking (GLAAS 2012).

The social and economic context, as well as other differences such as fuel prices, terrain, climate and design, renders cost comparisons difficult to apply systematically. Rassas (1992) provides a step-by-step approach to compare and report costs of water and sanitation development. This forms the basis of analysis and current work by IRC (Box 7).

There is currently no standard consistent accounting framework comparable to the one used by urban utilities and service providers (IRC 2011). Application of costing methodology and accuracy in reporting of actual costs of water and sanitation development varies considerably between organisations. Subscription to cost-recovery is rarely systematic across organisations. Long-term costs relating to direct support such as staff training, retention and development as well as staff time to develop and implement a scheme may not always be accurately reflected. In addition, it is extremely rare to see accurate accounts of community time and effort in costing.

Further information on costing for rural water technologies for the European Economic Area (although the technologies are relevant to other parts of the world) is on the OECD website [www.oecd.org/dataoecd/18/12/36228167.pdf](http://www.oecd.org/dataoecd/18/12/36228167.pdf). However, this document focuses on technology only with little attention to other aspects of costing. The African Development Bank (no date) has developed a cost recovery and user fees guideline document which attempts to systematise costing and fee policy; Practical examples of cost recovery methodologies and strategies abound. However, Mehta's (2003) work, although a little bit dated, provides a well-organised, and comprehensive overview.

#### Box 7: Life Cycle Costs (IRC 2011, pp24)

*"Life-cycle costs"* is an approach that should ultimately provide a better perspective on the range of costs for different types of WASH infrastructure, the relative weight of different components, the range of costs for different service levels and the cost of going from one service level to another (e.g. from a borehole with a hand pump to a small network system). The following cost components are included, and defined as follows:

- **Capital expenditure – hardware and software (CapEx)** – investments in constructing or purchasing fixed assets such as concrete structures, pumps, pipes and latrines to develop or extend a service. CapEx does not only cover hardware but includes one-off work with stakeholders prior to implementation and 'household coping costs' on, say storage tanks or water filters to achieve a satisfactory level of service.
- **Operating and minor maintenance expenditure (OpEx)** - recurrent (regular, ongoing) expenditure on labour, fuel, chemicals, materials, and purchases of any bulk water. Opex covers maintenance needed to keep systems running at design performance, but does not account for major repairs or renewals which are recognised as not recurrent. Sometimes the distinction between these categories is less than clear.
- **Capital maintenance expenditure (CapManEx)** asset renewal, replacement and rehabilitation. CapManEx covers the work that goes beyond routine maintenance to repair and replace equipment, in order to keep systems running.
- **Cost of capital (CoC)** is the cost of financing a programme or project; such as interest loans or the dividend on the CapEx investment by government as owner, or the shareholders in the case of a private company.
- **Expenditure on direct support (ExpDS)** includes both pre- and post-construction support activities directed to local-level stakeholders, users or user groups. It ensures the costs of ensuring that local governments have the capacities and resources to plan, implement and manage contracts or emergency situations when systems break down, and to monitor private or public service providers' performance.
- **Expenditure on indirect support (ExpIDS)** includes macro-level support, capacity-building, policy, planning, and monitoring that contribute to the sector working capacity and regulation but are not particular to any programme or project.

**The Total Expenditure (TotEx)** - combines the cost components described above. Because cost components are not directly comparable they cannot simply be added up. Thus specific methods are required to calculate total expenditure.

It should be noted that the terminology is taken directly from the IRC literature, and that application of this costing methodology is still at an early stage.

## 6 Water Resources and Topography

### 6.1 Water Resources Information

The environment and natural resource base is the foundation of all water supplies, including those in rural areas. Comprehensive and long-term data regarding the water balance, soils and land use patterns of a particular catchment, from a small river, or even a river basin is essential for planning purposes. One of the challenges to data management is that catchments rarely fall within simple political or administrative boundaries. A second challenge is that environmental monitoring is a long-term exercise, which does not yield immediate results, unlike the construction of infrastructure.

However, for drinking water supply services to work in the long-term, catchments may need to be protected, conflicts between different water needs have to be resolved and good quality, and well-organised information is required. RWSN (2012a) discusses some of the key environmental challenges for rural water supply service delivery. In this publication we point you to some key information sources.

Since 1992, 80% of countries have started reforms with respect to water resources management, and apparently there is greater perception of water-related risks and water competition today than there was in the past (UNEP 2012). However, despite this, and despite the importance of water resources to the sustainability of drinking water services, a comprehensive picture of water resources remains rather elusive for most water supply professionals. At times it seems that drinking water supply and water resources inhabit two worlds. This is a dangerous state of affairs.

There are countless publications on the topic of *Integrated Water Resources Management*. For those of you interested to learn more, we suggest that you start with the materials produced by the Global Water Partnership [www.gwp.org](http://www.gwp.org). They publish for both policy and technical level. UNEP (2012b) has published a status report on the *Application of Integrated Approaches to Water Resources Management*. Other key resources are given in Table 6.

The United Nations World Water Development Report (UNEP 2012), produced every three years, provides "a global strategic outlook on the state of freshwater resources, trends and management options". Although a highly informative report, its length (the first volume is over 850 pages long) requires considerable stamina. The Africa Water Atlas (UNEP 2010) "provides a visual account of Africa's endowment and use of water resources...analysing Africa's water issues...including] the role of water in the economy and development, food security... and environmental change".

At a much more operational level, WaterAid's (2012) "Water Security Framework", is useful. It provides many definitions, and places Water, Sanitation and Hygiene (WASH) within the wider spectrum of water needs. It also makes the links between WASH, food security, environment and health. It identifies programme objectives for WASH planners, integrating wider resource concerns into planning at the local level, especially in areas where sources are shared for domestic and productive use. It can be downloaded from [www.wateraid.org/documents/plugin\\_documents/water\\_security\\_framework\\_2012\\_final\\_lr.pdf](http://www.wateraid.org/documents/plugin_documents/water_security_framework_2012_final_lr.pdf)

**Table 6: Selected water resources information hubs**

Item	Website
International Water Management Institute (IWMI) Data portal	<a href="http://waterdata.iwmi.org">waterdata.iwmi.org</a>
Water Framework Directive Groundwater Visualisation Tool	<a href="http://www.wfdvisual.com">www.wfdvisual.com</a>
Water resource management model platform	<a href="http://www.hydroplatform.org">www.hydroplatform.org</a>
World-wide Hydrogeological Mapping and Assessment Programme (WHYMAP)	<a href="http://www.whymap.org">www.whymap.org</a>

Field observations and measurements with respect to the natural environment are essential for the preparation, design and development of rural water supplies, as well to support their long-term viability (de Haas *et al.* 2011). Considerable information on water resources, climate, the environment and meteorology as well as maps are available online, for free. In this chapter, we draw heavily on the paper presented by de Haas *et al.* (2011) at the 6<sup>th</sup> International RWSN Forum in 2011. It contains plenty of tips and ideas, as well as examples. However, as with information on drinking-water supplies, no amount of disparate on-line data can replace comprehensive and well-organised national water resources information, particularly if it is linked to a robust national planning process.

### 6.2 Groundwater Data

Water resources data, including groundwater maps are available for many countries. However, the existence of such information on paper with learned institutions (such as the Geological Society) does not mean that it is available online. Likewise, while such data may be available nationally, it may not be available at local government level. Thus, it is worth looking for information from other sources and even external support agencies. Key online sources are as follows:

- An online archive of technical literature on the hydrogeology of southern and east Africa from the British Geological Survey (BGS) can be downloaded free of charge on [www.bgs.ac.uk/sadc](http://www.bgs.ac.uk/sadc)
- The International Association of Hydrogeologists (IAH) provides a gateway to several national geological surveys [www.iah.org/links\\_externallinks.asp](http://www.iah.org/links_externallinks.asp)

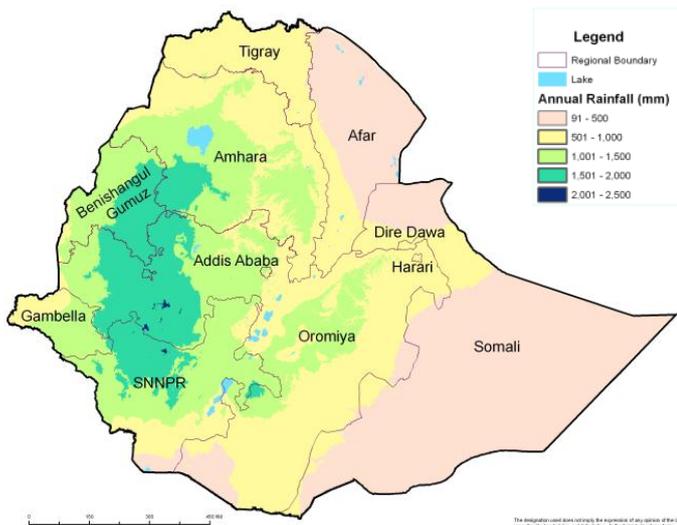
### 6.3 Climate and Environment Data

Many water projects rely on rainfall and climate data. Weather stations and meteorological departments around the world have plenty of information. However, lack of resources means that some local information may be available in hard copy only. It can be very worthwhile taking the trouble to put available data into an electronic format. But in an ideal situation, such data should be systematically managed and stored in-country, a topic which is beyond the scope of this RWSN publication. However, considerable data is available freely:

- The **Food and Agriculture Organisation (FAO)** collects, processes, stores and provides a wealth of climate data for free download (e.g. Figure 4). Information can be accessed

through [www.fao.org/nr/climpag](http://www.fao.org/nr/climpag) Free software is also available to enable graphs and maps to be constructed which extrapolate average rainfall, temperature and evaporation figures from neighbouring climate stations where there is little data available [www.fao.org/nr/climpag/pub/en3\\_051002\\_en.asp](http://www.fao.org/nr/climpag/pub/en3_051002_en.asp). The SamSam climate tool performs a similar function but is more user friendly [www.samsamwater.com/climate](http://www.samsamwater.com/climate).

**Figure 4: Annual Rainfall Data in Ethiopia is an example of a regional map** (FAO, 2012a)



organisation is encouraging user to improve maps with [www.google.com/mapmaker](http://www.google.com/mapmaker). Microsoft provide a similar service with their mapping website [www.bing.com/maps](http://www.bing.com/maps)

- Google Earth [www.google.co.uk/intl/en\\_uk/earth/](http://www.google.co.uk/intl/en_uk/earth/) enables users to navigate the globe, look at satellite images and view features such as roads, settlements, borders and photos. De Haas et al (2011) point out the clock feature in the toolbar enabling users to view historical images, which is particularly useful for examining environmental changes such as open water body sizes and forest cover.
- The Center for Geographic Analysis at the University of Harvard has created AfricaMap [africamap.harvard.edu](http://africamap.harvard.edu) which contains links to detailed Soviet Union and US army maps (offering a resolution of 1:200,000 to 1:1,000,000). These can be used as layers on Google Maps when using Google Earth. De Haas et al (2011) notes that these layers are accessible on: [www.samsamwater.com/samsamwater.kmz](http://www.samsamwater.com/samsamwater.kmz)
- The Food and Agriculture Organisation (FAO) provides a gateway to vast data sources on water resources. The Geonetwork [www.fao.org/geonetwork](http://www.fao.org/geonetwork) contains interactive geo-spatial maps, Geographic Information System datasets, satellite imagery and applications.
- The Map Library [www.maplibrary.org](http://www.maplibrary.org) is an online compilation of public domain maps and software mapping tools. At the time of writing, GIS files for all countries' administrative boundaries were available and Africa had more detail with satellite images provided for each country.

The difficult topic of climate change and adaptation is particularly challenged by data gaps. However:

- The World Health Organisation has published a guide to resilience in the face of climate change. WHO/DFID (2009) [www.who.int/water\\_sanitation\\_health/publications/97892415\\_98422\\_cdrom](http://www.who.int/water_sanitation_health/publications/97892415_98422_cdrom)
- The World Bank also has a climate data resource bank, [sdwebx.worldbank.org/climateportal](http://sdwebx.worldbank.org/climateportal) which can be used to obtain information on a variety of climatic variables using data from the University of East Anglia.

## 6.4 Soil Data

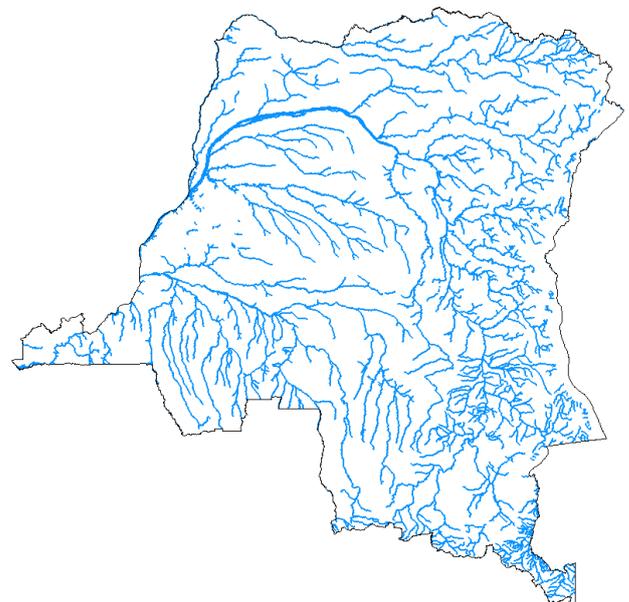
Soils maps for most countries can be found via the Cranfield University repository of global soil maps available for use by the public. Further information can be found here: [www.wossac.com](http://www.wossac.com). In addition, a digitised soil map for Africa is located at this EU site: [usoils.jrc.ec.europa.eu/esdb\\_archive/eudasm/africa](http://usoils.jrc.ec.europa.eu/esdb_archive/eudasm/africa)

## 6.5 Topographic Maps, Satellite Images and other Geo-Spatial Data

A number of online mapping sources are available. A key issue for water supply planners and implementers for rural and remote areas in particular, is that the scale of the maps may be too low to be. However, the technology and online availability are both changing all the time:

- Google Maps [maps.google.ch/maps](http://maps.google.ch/maps) can be a useful tool but they are not always as detailed as required. However, the or-

**Figure 5: Rivers in the Democratic Republic of Congo** (FAO, 2012b)



De Haas *et al.* (2011) describe tools which are of particular use to rural water professionals such as the Google Earth function which enables viewing of historical aerial data at a specified location. This can be used to view water systems such as dams during different time periods, enabling seasonal comparison or comparison of changes in forest and land use (*Ibid.*). Elevation data is displayed on Google Earth under the mouse pointer or toolbar, enabling elevations to be calculated for a given area by using Google Earth functions to draw a path and display elevation data.

## 7 Key Networks, Journals and Blogs

There are several publications, networks and information hubs which emphasise, or include rural water supply. Some focus on specific topics, while others are broader in scope.

Trying to understand what the numerous international efforts (Table 7) do and how they can be of use to practitioners is a challenge. Currently, *Sanitation and Water for All* is a high level advocacy platform; the *EU Water Facility* is primarily a funding mechanism, while *RWSN* documents and shares good practices. However, overlaps do exist and new initiatives come up. Indeed, it would be useful for these initiatives to clearly map out the role that they play, and how they relate to each other. UNICEF (2012) has prepared very useful training materials on the initiatives, partnerships and support organisations in the WASH sector.

**Table 7 Select International Networks, Associations & Partnerships Networks**  
(\* indicates explicit emphasis on rural water supplies)

International Networks, Associations & Partnerships	Website
Blue Planet Network	<a href="http://blueplanetnetwork.org">blueplanetnetwork.org</a>
Coalition de l'Eau*	<a href="http://coalition-eau.org">coalition-eau.org</a>
Freshwater Action Network*	<a href="http://www.freshwateraction.net">www.freshwateraction.net</a>
Global Water Partnership	<a href="http://www.gwp.org">www.gwp.org</a>
International Federation of Private Water Operators (AquaFed)	<a href="http://www.aquafed.org">www.aquafed.org</a>
International Network on Household Water Treatment and Safe Storage	<a href="http://waterinstitute.unc.edu/hwts/">waterinstitute.unc.edu/hwts/</a>
International Small Community Water Supply Network*	<a href="http://www.who.int/water_sanitation_health/dwg/scwsm_network">www.who.int/water_sanitation_health/dwg/scwsm_network</a>
International Water Association (IWA)	<a href="http://www.iwahq.org">www.iwahq.org</a>
Rural Water Supply Network*	<a href="http://www.rural-water-supply.net">www.rural-water-supply.net</a>
Sanitation and Water for All	<a href="http://www.sanitationandwaterforall.org">www.sanitationandwaterforall.org</a>
Water Supply and Sanitation Collaborative Council (WSSCC)	<a href="http://www.wsscc.org">www.wsscc.org</a>
World Water Council	<a href="http://www.worldwatercouncil.org">www.worldwatercouncil.org</a>

We know that there are many national (rural) water supply networks. However, currently there is no consolidated or well publicised information such entities, suggesting that coordination and exchange may also be weak. With the help of the membership, RWSN plans to list these national networks on its website.

Despite the rather long list (Table 8) of Journals and Information hubs available, we have no doubt that more is out there, particularly in other languages than English.

Volume 3 of this series (RWSN 2012c) provides a summary of guidelines and toolkits, including a list of sources for technical notes which are not covered here.

**Table 8: Select Journals and Information Hubs**

Journals	Website
International Journal of Water Resources and Development	<a href="http://www.tandfonline.com/toc/cijw20/current">www.tandfonline.com/toc/cijw20/current</a>
Journal of Water, Sanitation and Hygiene for Development	<a href="http://www.iwaponline.com/washdev/">www.iwaponline.com/washdev/</a>
Water Alternatives	<a href="http://www.water-alternatives.org">www.water-alternatives.org</a>
Water and Environment	<a href="http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1747-6593">onlinelibrary.wiley.com/journal/10.1111/(ISSN)1747-6593</a>
Waterlines	<a href="http://practicalaction.org/waterlines">practicalaction.org/waterlines</a>
A list of further water related journals can be found here: <a href="http://water.sigmaxi.org/?page_id=39">water.sigmaxi.org/?page_id=39</a>	

Information Hubs	Website
African Development Bank Rural Water Supply Initiative	<a href="http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/rural-water-supply-sanitation-initiative/">www.afdb.org/en/topics-and-sectors/initiatives-partnerships/rural-water-supply-sanitation-initiative/</a>
Akvopedia	<a href="http://www.akvo.org">www.akvo.org</a>
Connect International	<a href="http://www.connectinternational.nl/english/home">www.connectinternational.nl/english/home</a>
GW-Mate	<a href="http://water.worldbank.org/gwmatepubs">water.worldbank.org/gwmatepubs</a>
Hydrology PhD theses	<a href="http://www.hydrology.nl/phd-theses.html">www.hydrology.nl/phd-theses.html</a>
Massachusetts Institute of Technology (MIT) Water and Sanitation for All: A Practitioners Companion	<a href="http://web.mit.edu/urbanupgrading/waterandsanitation/home.html">web.mit.edu/urbanupgrading/waterandsanitation/home.html</a>
OECD (The Water Challenge: OECD's Response)	<a href="http://www.oecd.org/environment/biodiversitywaterandnaturalresourcesmanagement/thewaterchallengeoecdresponse.htm">www.oecd.org/environment/biodiversitywaterandnaturalresourcesmanagement/thewaterchallengeoecdresponse.htm</a>
Sustainable Sanitation and Water Management Toolbox (SSWM)	<a href="http://www.sswm.info">www.sswm.info</a>
Technical resources forum	<a href="http://www.watersanitationhygiene.org">www.watersanitationhygiene.org</a>
The International Water and Sanitation Centre (IRC)	<a href="http://www.irc.nl">www.irc.nl</a>
UNICEF	<a href="http://www.unicef.org">www.unicef.org</a>
UN-Water	<a href="http://www.unwater.org/documents.html">www.unwater.org/documents.html</a>
WASH sustainability charter	<a href="http://washcharter.org">washcharter.org</a>
Water and Sanitation Program	<a href="http://www.wsp.org">www.wsp.org</a>
Water Service Mapping by Water for People	<a href="http://watermapmonitordev.appspot.com">watermapmonitordev.appspot.com</a>
Water Supply and Sanitation Collaborative council (WSSCC)	<a href="http://www.wsscc.org">www.wsscc.org</a>
Water, Engineering and Development Centre (WEDC) resources	<a href="http://wedc.lboro.ac.uk/knowledge/know.html">wedc.lboro.ac.uk/knowledge/know.html</a>
WaterAid document library	<a href="http://www.wateraid.org/international/what-we-do/documents-and-publications">www.wateraid.org/international/what-we-do/documents-and-publications</a>
Waterweb	<a href="http://www.waterweb.org">www.waterweb.org</a>

## 8 Closing message

This publication provides an introduction to the depth and breadth of information available regarding rural water supplies. It has not attempted to be exhaustive but has instead given a taste of what is available and likely to be most applicable for those working on rural drinking water issues. There is great potential for information regarding rural water supplies to be 'democratised' further, and the authors of this paper welcome any additional recommendations or resources that you would like to share with us.

The increasing accessibility of information to many rural water practitioners regarding rural communities, environments and research coupled with tools for analysis has the potential to open up exciting possibilities in the rural water supply sector. Challenges still remain in how this information is shared with rural communities and how to improve their currently limited opportunities to contribute to the process of information sharing in rural water supply development. We know that knowledge and information in itself is not sufficient to make a difference in rural water supplies. Sound experience and understanding of how to apply lessons learnt and best practice is key. Types of implementation, as well as links to guidance materials and tools for implementation are given in other publications in the RWSN-IFAD series.

## Glossary

**Budget support:** a method of development assistance whereby resources are transferred directly to a partner government treasury. Thus, Government can directly manage disbursements in line with national budget priorities.

A **Rights Based Approach** is aimed at facilitating a process whereby a person is empowered to hold the State accountable to honour their human rights and legal entitlements. Adopting a rights-based approach involves not only focusing on the content, but also on the process through which these rights are realised.

**Sector Performance Report:** analysis and update on the progress, strengths and weaknesses of programmes and projects with a particular development focus, such as water supply and sanitation, agriculture, health or energy. It is usually undertaken on an annual basis and ideally led by national governments.

The **Sector Wide Approach (SWAP)** is a mechanism whereby Government, civil society and *Development Partners* support a single policy, development plan and expenditure programme under Government leadership, following a common approach.

**Service delivery** is on the long-term provision of water supplies, as opposed to the implementation of discrete, one-off projects. It includes the physical infrastructure required to provide water and the management systems and capacities required to keep sufficient, reliable and safe water flowing.

**Wealth quintiles** - a statistical value of a data set on wealth that represents 20% of a given population. The first quintile represents the lowest fifth of the population (1-20%); the second quintile represents the second fifth (21% - 40%) and so on. "Wealth" in this context is based on asset ownership, rather than income/expenditures and it is a relative measure (comparing individuals in a population to each other). It often causes confusion because wealth is equated with money. Additionally, the wealth index is a proxy indicator for a household's long-term standard of living (a view supported and validated by the World Bank).

Notes

A large rectangular area with horizontal dashed lines, intended for taking notes.

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All RWSN references are available on <http://www.rural-water-supply.net>

Web-addresses with hyperlinks are provided in the text. Although checked at time of going to press please note they may change or be removed by the owners of those websites.

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