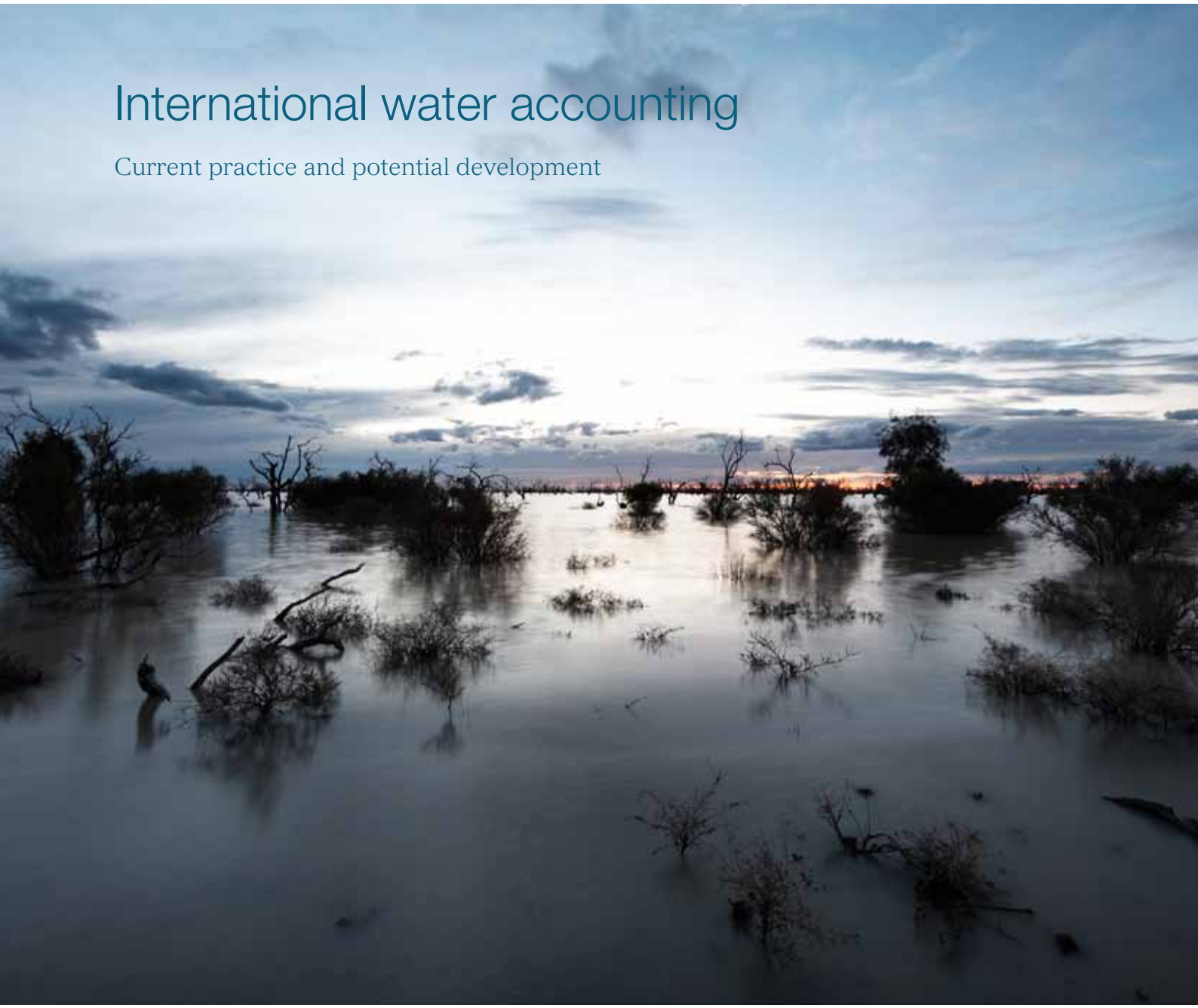
Australian Government
Bureau of Meteorology

Water Accounting Standards Board

An independent advisory Board to the Bureau of Meteorology



International water accounting

Current practice and potential development

Water Information
DATA › INFORMATION › INSIGHT

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Front cover: photo by Lynton Crabb

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1. Background

The Water Accounting Standards Board (WASB) is an independent advisory board to the Australian Bureau of Meteorology, working with the Australian water industry to develop consistent standards for water reporting.

WASB was established in April 2009 and is supported in its work by the Water Accounting Standards Board Office (WASBO), which is staffed by, and located within, the Bureau of Meteorology.

WASB's terms of reference include, *inter alia*:

- Maintaining the *Water Accounting Conceptual Framework* for the Preparation and Presentation of General Purpose Water Accounting Reports
- Developing and drafting *Australian Water Accounting Standards*, including auditing and assurance standards as necessary
- Promoting awareness of the water accounting discipline to build understanding, invite feedback and encourage adoption
- Assisting in the testing of water accounting standards
- Maintaining awareness and linkages with relevant international bodies.

Consistent with its terms of reference, WASB requested WASBO to undertake a desktop review of relevant water accounting and reporting activities around the world, to analyse the opportunities to develop linkages with similar bodies and to present the results in an internal report to WASB.

In the interests of transparency and knowledge exchange, WASB has elected to publish this report.

2. Introduction

Water accounting as a discipline is not new. In Australia, water utilities and regulatory agencies regularly collect water-related data, store the data in data management systems, and produce water reports. The National Water Account is an annual publication delivered by the Bureau of Meteorology that contains standardised information about the management of Australia's water resources. Water accounting is also practiced by the Australian Bureau of Statistics and the Australian Bureau of Agricultural and Resource Economics and Sciences, who are chiefly concerned with the economic value of water.

At an international level, the principle method of water accounting is statistical. It is used by organisations such as the United Nations as well as national governments, to measure the contribution of water to a national economy, and inform natural resource management practices. Nowhere else in the world besides Australia, have water accounting standards borrowed from the financial accounting standards-setting experience, as the Water Accounting Standards Board (WASB) has done in developing both the Water Accounting Conceptual Framework (WACF) and the first Australian Water Accounting Standard.

This paper reviews the water accounting activities of the above-mentioned international bodies, as well as the development of corporate sustainability reporting in regions around the world, in order to identify opportunities where the further development of Australian water accounting could benefit from cooperation between the Water Accounting Standards Board and overseas organisations. This may be by testing or implementing Australian Water Accounting Standards (AWAS) in new situations, or accessing experience in reporting water information using other water reporting standards to gain insights into the future development of AWAS.

The paper is structured into eight parts reflecting the regions covered in this paper:

1. North America
2. Central and South America
3. Europe
4. Middle East
5. Africa
6. East Asia
7. Central and South Asia
8. Non-Government Organisations (NGO)

3. Methodology

This paper applies five criteria to assess the likely value of cooperation between the region or organisation and Australia, through the WASB. A score from one to five is attributed to indicate whether the criterion is met, and the sum of these scores is used to rank the potential opportunity. The five criteria are as follows:

1. **Is water a scarce resource in the area?**
   Put plainly, this is a situation where the demand for water is greater than the supply. Areas that are under stress are likely to be more interested in producing water information reports and adopting water accounting standards as part of a water reporting framework[1].

2. **Is there a water sharing plan in place in the area that recognises water rights and other claims?**
   A prerequisite to adopting a water reporting framework like that of the AWAS is the establishment and understanding of who has the rights to and obligations with respect to water in a given area[2].

3. **Does the area regularly publish water information reports?**
   The presence of such reporting tends to indicate that the public is interested in the stewardship of water resources in a given area – although its absence does not, of course, necessarily mean that the public is not interested. Further, the existence of a current reporting regime identifies an opportunity to test AWAS in a new area and/or to learn from local water accounting practices[3]:

4. **Are the water information reports produced in accordance with a standard/guidelines?**
   If water information reports are being produced in accordance with a standard – rules- or principles-based – this may provide valuable insights to WASB for the future development of AWAS[4]:

5. **Is corporate responsibility reporting commonplace?**
   If corporate sustainability reporting is widespread, it is likely that where water poses a material risk (physical, reputation, regulatory, or litigation) to operations, it is disclosed. This may indicate an opportunity for AWAS to be applied in an organisational context[5].

1 To identify areas of significant water stress, the United Nations World Water Development Report 3 (2009) was the primary reference.

2 To identify areas where there is a water sharing plan, this paper will refer to several sources, although information on developing countries will primarily be based on the United Nations World Water Assessment Programme's milestones, as set out in the dialogue paper Integrated Water Resources Management in Action (2009).

3 To identify areas where there are regularly published water information reports, this paper will refer to the UN Statistics Division's Global Assessment of Water Statistics and Water Accounts (February 2009). Additional regular water information reports were also identified, being those that are published at least every four years, and may be for a country, area, region, industry, or other relevant water entity.

4 This paper will identify water reporting frameworks that are based on a standard by considering whether the standard is principles-based or rules-based, whether reporting is volumetric, if assurance/compliance reports are required, and whether such reporting is mandatory or voluntary.

5 To identify countries where corporate responsibility reporting is commonplace, and where corporate responsibility reports are assured by a third party, the KPMG International Survey of Corporate Responsibility Reporting (2008) was used. According to this survey, 77% of G250 and 69% of N100 reporting companies follow the Global Reporting Initiative's Reporting Guidelines, about 20% use internally-developed frameworks and 19% use national standards to inform reporting obligations.

4. Summary

The scores for all entities ranged from 5 to 22 and represented a general requirement for water information in the countries investigated. However with varied levels of institutional, regulatory and financial support certain areas are less likely to provide opportunities for cooperation than others.

The entities surveyed that received greater than 11 out of 25 are considered to have good potential for further cooperation with the WASB, and are shown in the table below. For a complete list of entities and scores, see Appendix 2.

TABLE 1: ENTITIES WITH THE HIGHEST POTENTIAL FOR FURTHER COOPERATION WITH WASB

Country/Organisation	Total Score
South Africa	22
Canada	20
European Union	17
United Nations	17
Spain	17
OECD	16
World Bank	14
Mexico	14

Country/Organisation	Total Score
Nile River Basin	13
Botswana	13
Namibia	13
Israel	13
Peru	12
Danube River Basin	12
China	12
Aral Sea Basin	12

A summary for each of these entities is provided below:

South Africa: In South Africa there is a water sharing plan that recognises water rights and other claims as well as a situation of water stress. Further, there is a need for water information by water resource managers, as well as an interest in water information among the general public. Further, with the application of the Preliminary Australian Water Accounting Standard (PAWAS) trialled in South Africa as part of the Australian Research Council grant heads by Professors Godfrey and Chalmers, there is potentially the capacity and interest to collaborate with WASB.

Canada: There is a principles-based standard for the assurance of water information reports, as well as regular water reports and some proposed developments of water information. This could provide an opportunity to apply AWAS to existing water information reports and also gain insights that are relevant to the development of AWAS from an existing water information reporting standard in Canada.

European Union: Like Canada, the European Union offers some potential opportunities in both further testing the AWAS in different situations as well as providing insights to the future development of AWAS. It currently has in place a rules-based standard for the production of water reports as well as a single overarching legislative instrument for water resource management which produces regular water reports. In addition, there is ongoing development of a water information system, and – much like Canada – the existence of a principles-based standard for the assurance of water information reports.

United Nations: The United Nations (UN) have ownership of the water accounting standard, the System of Environmental-Economic Accounting for Water (SEEAW), and while this standard does not offer a lot of opportunity for collaboration with WASB, collecting and publishing reliable information is very important for the UN's information system Aquastat, and so may provide opportunities to apply AWAS to new situations, and to access the existing water information reporting expertise within that organisation.

Spain: Due to a combination of factors such as water shortages, a centralised water planning and water rights system and having completed a pilot test of the PAWAS, Spain appears to be a good candidate for future cooperation in the application or development of AWAS.

OECD: The Organisation for Economic Co-operation and Development (OECD) produces regular reports on water management practices with a strong emphasis on quality-assuring data and benchmarking. As such, they may be useful partners for WASB's understanding of the use and assurance of reports produced under AWAS.

World Bank: There is considerable interest in water information and the broad acceptance of water-related standards in the World Bank, and so it may be an appropriate partner for cooperation with WASB. Further, due to their considerable expertise in reporting water information and performing assurance functions, they may provide meaningful cooperation opportunities for the future development of AWAS.

Mexico: There is both a significant amount of experience in water information reporting and a large amount of interest in water-related information in Mexico. With regular water information reports produced (not prepared to a standard), and proposed developments of water information reporting in the area – there may be interest to collaborate with WASB.

Nile River Basin: There is a multilateral organisation that promotes cooperative water resource management for riparian states of the Nile River. One aim is to improve water information quality, reliability and availability for planning purposes, an aim that is consistent with the production of General Purpose Water Accounting Reports (GPWAR).

Botswana: Similar to Australia, Botswana has an arid to semi-arid climate, including large areas of desert and internationally significant environmental sites. As seen by their experience producing water accounts and their reputation for sound environmental stewardship, there may be an opportunity to cooperate in the application and development of AWAS.

Namibia: Namibia has similar experience in water accounting to Botswana, and though it has a different level of regulation of water resources, there may be sufficient interest to suggest that there is potential for a partnership in the development of AWAS.

Israel: Israel has significant interest in water management and a large amount of expertise in efficient water management. A partnership to develop AWAS may be beneficial to both parties to improve the reporting and compliance aspect of water resource management.

Peru: Although there is a need for reliable water information, and a suitable institutional structure to enforce it, there does not appear to be sufficient capacity to implement AWAS at the present time.

Danube River Basin: The International Commission for the Protection of the Danube River (ICPDR) is a multinational body that has a great deal of expertise in monitoring and reporting of water quality, and performance against water management and sharing plans. As reporting on water quality has not specifically been addressed in the development of AWAS to date, the ICPDR could prove to be useful partners.

China: In China there is a situation of water stress in the northern and western areas, as well as a water sharing plan that recognises water rights and other claims. Given the in-principle agreement in place between the Australian National Water Commission and the Chinese Department of Water Resources to cooperate on water accounting there may be both the capacity and the imperative to collaborate on the further development of AWAS.

Aral Sea Basin: The regionally-significant Aral Sea Basin is under significant water stress, and there is a multilateral planning organisation responsible for reporting on a resource management plan. No reports are currently published, though with the aim to establish a unified system of water accounting, the need to report water information transparently and comparatively is a likely consequence – and the application of AWAS may assist in this endeavour.

As shown in the remainder of the paper, there are some general observations that can be made about water reports in developing countries. For instance, the monitoring, information management and dissemination of water information – including having standard procedures for data collection, processing and analysis – is more advanced in Central and South American countries than in African, and less advanced than in Asian and in developed countries in general[6]. Further, it appears that there are regular reports on the development of water resources in developing countries prepared by government agencies reporting to international aid agencies, such as the World Bank, the European Agency for Reconstruction, and AusAID as the availability of reliable water information is a key criterion for development agencies when considering a water-related development project. Similarly, there are reports in relation to sharing water across international boundaries, and for the management of Ramsar-listed wetlands.

4.1 Recommendation

While it appears that there are no current equivalents with AWAS, opportunities in the international sphere for future cooperation with Australia in the development of water accounting standards do exist. These opportunities may be evaluated as suitable for future cooperation with WASB according to the number of criteria that they meet from the list described in the introduction to this paper.

6 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (page 36)

5. North America

Areas of North America that are under water stress include the Mid-Western states of the USA, plus Florida, North Carolina, and parts of Alberta and Saskatchewan in Canada. The arid north-west and central regions of Mexico are also under water stress[7].

5.1 United States

Water rights are generally established pursuant to state law, but there are exceptions, most notably, the concept of federal reserved water rights. Reserved water rights are rights that are established when the federal government reserves land for a specific federal purpose, e.g. Indian reservations, national wildlife refuges, federal forests and military bases.

There are two divergent systems for determining water rights. 'Riparian water rights' (derived from English common law) are common in the east and 'prior appropriation water rights' (developed in Colorado and California) are common in the west[8]. Texas and the states directly north of it, the west coast states, and Mississippi have a mixture of systems.

The National Water Information System (NWIS) is managed by the United States Geological Survey (USGS), and is used to investigate the occurrence, quantity, quality, distribution, and movement of surface and underground waters and disseminate the data to the public, state and local governments, public and private utilities, and other Federal agencies involved with managing water resources. While this information system is volumetric, it is principally concerned with providing data to other organisations that have management responsibilities for water. As such, it is unlikely that there are insights to be gained from the United States that are relevant to the development of AWAS.

5.2 Canada

Water rights vary between Canadian provinces. Each province falls into one of the following four approaches to water rights: prior allocation, public authority, riparian rights, or civil code[9]. Aboriginal water rights play an important role in each province.

Prior to colonization, Aboriginal customs (or customary law) governed the use of water in Canada and continues to exist in tandem with Canadian law. Aboriginal rights and treaty rights, including certain customs and practices, became constitutionally protected in 1982. This means any rights, including water rights, not extinguished before 1982 can no longer be infringed upon by the government. All of the water rights listed above can be subject to Aboriginal claims.

Water quantity and quality monitoring is carried out across the country by Environment Canada[10]. Work is under way to build a comprehensive information system for water information. This project appears to be similar in purpose to the NWIS system in the United States and the Australian Water Resources Information System (AWRIS) project in Australia.

Another broad source of water information is Statistics Canada's national environmental reports, which summarise trends in water quantity, water quality, water use, and human impact on important waterways. These reports do not appear to be based on the United Nations' SEEAW standard, however they are intended to achieve a similar purpose: to integrate environmental stocks and flows into measurements of the national accounts such as Gross Domestic Product (GDP). The information in these reports is assured using the Statistics Canada Quality Assurance Framework (2002), which is a principles-based framework that reflects international best practice.

7 United Nations World Water Development Report 3 (2009) (page 92)

8 For more details about these water rights, see Appendix 1

9 For more details about these water rights, see Appendix 1

10 Also known as the Department of the Environment

The annual report on the Canada Water Act (since 1970) gives information on the water resources of Canada at a regional water resource planning area level. It is chiefly a compliance report, without a great deal of volumetric information.

One catchment area in Canada – the Fraser Basin, near Vancouver – produces an annual Sustainability Snapshot. This report includes information about the natural resource management practices and performance in the area, including water quality, agricultural and urban water use, and waste management. There is little volumetric information as scarcity does not seem to be an issue, and there is no attempt to produce statement-style summaries; rather, qualitative statements (e.g. good, fair, mixed, poor) are made in relation to key indicators. While the same indicators are used between years, the report is not prepared according to a standard.

A policy statement on water in Canada recognises the need for more water data and information and the need for greater public awareness about water information – it does not, however, recognise the need for a water reporting standard, such as AWAS.

With a standard for the assurance of water information reports, regular water reports and some proposed developments of water information, there are opportunities to apply AWAS to existing water information reports, as well as an opportunity to gain insights in to future development of AWAS from Canada.

5.3 Mexico

Water resource management in Mexico is under the responsibility of the federal government, through the National Water Commission, with some powers delegated to state-level water commissions and basin-level authorities. The basic water license is a title of concession or allocation, which may be registered in the (federal) Public Registry of Water Rights.

In the National Water Commission's policy document 'Mexican National Water Program 2007–12', there are three initiatives that may indicate an opportunity for AWAS to become involved:

- Enhance the technical, administrative and financial development of the water sector
- Consolidate the participation of users and organised society in water management and the promote a culture for the proper use of this resource
- Create a culture for paying duties and complying with the Law on National Waters in its administrative aspects.

The objectives do not include any need to develop a standard for reporting on water information; however it appears that the National Water Commission does prepare water accounts in the Deputy Director General's Office for Planning. The major challenges that are recognised in this report include improving the system for measuring, monitoring and dissemination of water information to improve planning by government, and informing users of water availability, as well as to verify compliance with standards in effect in the water sector.

The National Water Commission also publishes the annual report 'Statistics on Water in Mexico' and has done since 2000. This includes contextual information, water resource information (surface and groundwater), types of water use and details of water infrastructure, the water management regime, environmental flows, and future scenarios for water management in Mexico. The information is largely volumetric and there is disclosure of performance targets, although it is not a compliance report. While it does not explicitly state that the preparers have applied the SEEAW standard, it is included in the bibliography.

This report appears to be well-developed and shows there are both a significant amount of expertise in water information reporting and a large amount of interest in water-related information in Mexico which may offer opportunities for collaboration with WASB.

6. Central and South America

In several countries in Central and South America there is a water sharing plan[11] that recognises water rights and other claims, although there is very little overlap with those areas that are under water stress[12]. In Argentina and Peru, where both these conditions are met, it may be claimed that there is likely to be some interest in adopting water accounting standards as part of a water reporting framework. In the other countries with water scarcity, there may be some interest in water accounting standards, but there may not be the imperative or the capacity to do so.

6.1 Peru

Peru has a lot of fresh water, but it is mostly unavailable on the East side of the Andes, and provides water to the Amazon River instead of the populated coastal plain on the western side of the mountains. Peru also faces problems of water pollution from the mining industry, which affects urban potable water supplies.

A recent Water Law (2009) established several water management bodies, as well as water rights, planning arrangements, and an accountability framework with the National Water Authority as the chief enforcer, rather than local governments. In order to facilitate this management structure, a water resources information system is under development, with the agreement to make accurate information publicly available.

The United Nations Statistics Division claims that Peru already produces water accounts under the SEEAW standard (and is therefore listed as a report preparer in this document), but a publicly-available version, or any reference to the project, could not be found.

While there is a need and an interest in water information, there does not appear to be sufficient capability in Peru to collect the required information and produce reports. As such, it is likely not to be a suitable partner for the implementation and development of AWAS.

This paper could not identify any specific reports or reporting standards that could provide opportunities for cooperation for WASB in Central and South America.

11 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

12 United Nations World Water Development Report 3 (2009) (page 92)

7. Europe

7.1 Spain

Southern Spain regularly suffers from severe drought, and relies on a mix of surface water, groundwater and desalination to supply urban areas. Spain currently has 700 desalination plants, according to the International Water and Sanitation Centre.

A cornerstone of the legal framework for water supply and sanitation is the 1985 Water Law (Ley de Aguas). Policy and regulation functions for water supply and sanitation are shared among various Ministries. For example, the Ministry of Environment is responsible for of water resources management and the Ministry of Health is responsible for of drinking water quality monitoring.

There are fifteen Basin Agencies (Confederaciones de Cuencas Hidrográficas) – nominated by the Minister of the Environment and appointed by cabinet – that are responsible for planning, constructing and operating major water infrastructure such as dams, undertaking hydrological studies, elaborating basin plans, setting water quality targets, granting permits to use water, monitoring and enforcement. These activities must now comply with the European Union's Water Framework Directive.

The Ministry of the Environment publishes a regular state of the environment report, including water information. It is unclear whether this report is prepared in accordance with any standard. A pilot was undertaken in 2010 to test the application of the Preliminary Australian Water Accounting Standard in Spain. For these reasons, it is likely that there is sufficient interest in Spain to justify future cooperation in the development of AWAS.

7.2 Developing countries

In several developing countries in Europe there is a water sharing plan[13] that recognises water rights and other claims although similarly to the finding in South and Central America. Due to the fact that there is no overlap with those areas that are under water stress[14], it is unlikely that there is sufficient capacity or interest to implement water accounting standards.

In 2009, Turkey prepared the 'Turkey Water Report' in preparation for the 5th World Water Forum held in Istanbul. It is principally a contextual document that contains some climatic, infrastructure, water policy, and environmental water information as well as international water agreements. It appears to be a once-off report, and there are no references to suggest it was prepared in accordance with SEEAW or any other standard.

This paper could not identify any other specific reports or reporting standards that could provide opportunities for WASB to cooperate with report preparers in developing countries of Europe.

7.3 Danube River Basin

The International Commission for the Protection of the Danube River (ICPDR) is a multilateral organisation with responsibility for managing water resources in the Danube River Basin. 'The Danube River Basin District' report is published annually and details contextual, water sharing and water quality information, as well as regulatory framework, economic analysis, and a future outlook.

The ICPDR operates under several self-imposed standards, which are all published on the ICPDR website. These standards relate principally to water monitoring and water quality, rather than management practices and water quantity.

While the issues faced are quite different to those in Australia, the ICPDR operates under a transparent, best practice framework that could provide useful insights to the development of AWAS, in particular for the reporting of water quality issues.

13 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

14 United Nations World Water Development Report 3 (2009) (page 92)

7.4 European Union

The European Union Water Framework Directive (EU WFD), signed by the European Commission in December 2000, sets out water policy principles, definitions, monitoring requirements, pricing guidelines, discharge limits, reporting arrangements, and penalties for member states. It set a target of four years for states to complete water resource assessments of each river basin district, and nine years to produce a management plan for each district. Progress to date has seen that most member states have ratified the EU WFD, the river basin boundaries are well established, and member states have set up national authorities in preparation of a management plan.

Under the EU WFD, member states must provide river basin management plans to the EU Commission for checking prior to being legislated in 2012. It is anticipated that subsequent to their ratification, member states will then provide progress reports to the commission in which the main part will be made public. A confidential part that reports on compliance with external obligations will then be audited by the EU Commission officers, and occasionally a more thorough compliance check will be undertaken by external consultants. To guide this checking process there is an internal compliance manual, as well as principles spelled out in published non-binding guidance documents from the Common Implementation Strategy of the EU Commission.

Additionally, there are other water reporting obligations to international commissions responsible for the administration of Conventions on the seas (relating to discharges into seas) and Rivers (e.g. Rhine, Danube and Elbe). The Rhine is one of five river basins in the world that are shared between nine and 11 countries. The river that flows through the most nations is the Danube, which travels within the territory of 18 nations. There is regular reporting on discharges into the Rhine under the International Commission for Protection of the Rhine. Also, the United Nations Economic Commission for Europe Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes, convened in Helsinki in March 1992, has been ratified by 35 European countries.

Regular reports are produced by the environmental agencies listed, including the European Environment Agency's report 'Water Resources Across Europe – Confronting Water Scarcity and Drought (2009)'. This report applies the SEEAW standard, and it is unclear whether it will become an annual report, or if it is a once-off. It includes information on water resources, water use in urban, energy, industry and agricultural sectors, and provides contextual information on water policy and water-related issues affecting European countries.

Currently, the European Environmental Agency relies on its system EUROWATERNET for information it requires on the pressures on, state of, and impacts on the quality and quantity of water across the whole of Europe. This information comes from the member states existing databases on a voluntary basis.

Water information is also collected by Eurostat – the Statistical Office of the European Communities, following the economic standards of the Organisation for Economic Co-operation and Development (OECD) and the United Nations. These standards include SEEAW as well as a best practice principles-based assurance framework, the European Statistics Code of Practice (2005).

These data are normally collected by a central agency by way of surveys and questionnaires. Criticisms of these existing reporting obligations include that information is incomplete, the format of the report varied, it is not clear to member states what information has to be reported, the quality of the information is difficult to validate, and there are differences of interpretation of data that lead to information that is not comparable.

The goal of the Water Information System for Europe (WISE) – in development since 2003 and recently commenced operating – is an information system designed to collect and report water-related information required under the EU WFD. It is intended to progressively replace existing reporting obligations over the period 2007–13, for the purposes of checking compliance with EU legislation, assessing the state and trends of the environment that either cause or result from changes, and use information to assess the effectiveness of policy. However, issues of data ownership exist that may limit the ability of collectors to publish the information.

WISE appears to rely on a rules-based approach for developing water information standards, rather than a principles-based standard such as AWAS. In other words, it aims to improve the consistency and comparability of data by formulating more precise surveys and questionnaires. Nevertheless, this standard may provide useful insights into the development of AWAS and therefore represents a good opportunity for future collaboration with WASB.

8. Middle East

8.1 Jordan

Jordan has a similar climate to Israel, and also collects water from surface water, groundwater and treated/desalinated water. Its cross-border agreements for water management are the result of both peace treaties and bilateral agreements.

There is little data available for water in Jordan, which has hampered its ability to produce a water account under the SEEAW standard. It made an attempt in 2007, however it appears a completed account has not yet been published. Water data has been highlighted as an area of concern for the development of the national economy, including periodic assessments of its available and potential water resources, through the National Water Strategy.

It appears that there would likely be interest, but a lack of capacity, to implement AWAS in Jordan at the present time.

8.2 Other developing countries

In Jordan and Syria there is a water sharing plan[15] that recognises water rights and other claims and both are under water stress[16]. As such, there may be a prospect of collaborating with WASB on the testing and implementation of AWAS in these countries. However, there does not appear to be any water information reports or standards in place. It is unlikely that AWAS will be tested in other developing countries in the Middle East identified as being under water stress, namely Iraq, Iran and Yemen.

8.3 Israel

Israel obtains water from four sources: surface water collected naturally from the Sea of Galilee and the Jordan River; the north-eastern, western and eastern aquifers; and through desalination and water recycling.

All of these water sources, except desalination and water recycling, are the result of international boundary agreements or ceasefire/peace treaty arrangements, such as the 1995 Interim Agreement (Oslo Peace Process) that provides certain volumes of water to Palestinians, and the 1995 Israel-Jordan Peace Treaty. There do not appear to be reporting obligations as part of these agreements.

This may change in the near future, as a Strategy for Water in the Mediterranean is approaching completion. The strategy was drafted by a group of experts, in essence the directors-general of water in the respective countries' ministries, after being mandated in December 2008. It is modelled on the European Union Water Framework Directive and includes 42 other countries along with Israel. The strategy contains four fields of action: effective water governance, water financing and valuation, water demand management and climate change adaptation.

Water is the responsibility of the Minister of National Infrastructures, and managed by the Council of the Governmental authority of Water and Sewerage. An annual water production and supply license is issued to each water user. This sets out volumes, conditions, and restrictions to the water allocation. Agricultural water users are allocated a quota based on farm size, soil type and water production type (i.e. treated waste, rain, diversion, etc.). Industrial water users are allocated a quota based on product and scope of production. Domestic consumption allocation is based on the number of users, and supply companies are not allowed greater than 12 per cent losses.

15 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

16 United Nations World Water Development Report 3 (2009) (page 92)

In December 2010 Israel published a water account for the reporting year 2006, following the SEEAW standard. Israel is widely recognised for its efficient urban supply system and irrigation practices, and water is seen as a national security issue. As such, there may be scope to access their expertise in water management and help meet their reporting needs through working together in the development of AWAS.

8.4 Other developed countries

Developed countries of the Middle East under water stress include Saudi Arabia, Oman, and the United Arab Emirates. While all these entities have a water sharing plan that recognises water rights[17] and other claims in place, it seems that no publicly-available water reports are published. There are water reports on the desalination industries published quarterly by market research companies, focusing on the markets of Saudi Arabia, Oman, and the United Arab Emirates.

While there may potentially be the need for more transparent water information, and some of the institutional arrangements are in place, it appears there is unlikely to be any collaboration on the development of water accounting with the Middle East in the short term.

17 For more details about the water rights of Israel and Oman, see Appendix 1

9. Africa

9.1 Botswana

Botswana is arid and semi-arid, with low rainfall and high rates of evapotranspiration. It has five major drainage basins, many of which are managed in combination with its neighbours, and including the Okavango basin – an internationally significant environmental site.

The Ministry of Minerals, Energy and Water Affairs is responsible for national water policy. There are both urban and environment water management strategies, although there is no agricultural water management strategy. Water rights apply to surface and groundwater, and are linked to land possession. Botswana is recognised regionally as having good environmental governance and natural resource planning.

Botswana has produced two water accounts using the SEEAW standard, in 2001 and 2006, including yearly and trend information and economic uses of water.

Due to their experience preparing accounts, and the government's interest in developing their natural resource management, Botswana has potential to assist in the application and development of AWAS.

9.2 Namibia

Similar to Botswana, Namibia is an arid country that manages six major drainage basins, including the Okavango Basin, in cooperation with its neighbours. It is the most arid country in sub-Saharan Africa.

There is a strong regulatory framework for managing water resources internally and with its neighbours, including international protocols and conventions with reporting and compliance obligations, such as:

- the Zambezi River System Action Plan (ZACPLAN)
- the UN Convention on the Law of the Non-Navigable Uses of International Watercourses
- the International Convention on Wetlands (Ramsar)
- the SADC Protocol on Shared Watercourses.

Water rights in Namibia are based on Riparian rights and so are linked to land possession. There is little information available on agricultural licensing arrangements or water use, although management of irrigation areas has been devolved to locally-run boards and community-run committees.

Namibia has also prepared water accounts under SEEAW, in 1997 and 2001. Together with Botswana and South Africa, Namibia participates in a Southern Africa water accounting program run by the University of Pretoria, South Africa.

As with Botswana, Namibia has experience preparing accounts and an apparent interest in developing their natural resource management. As a result, it may be a good partner in the application and development of AWAS.

9.3 Other developing countries

In several developing countries in Africa there is a water sharing plan18 that recognises water rights and other claims although there is very little overlap with those areas that are under water stress19. Where there is overlap, such as in Algeria, Tunisia, Egypt, Botswana and Lesotho, it can be asserted that there may be some interest in adopting water accounting standards as part of a water reporting framework. In other developing countries in Africa it seems unlikely that the institutional arrangements would be in place to instigate water accounting standards.

The Nile Basin Initiative is a multinational organisation comprising riparian states in the Nile River Basin, seeking to cooperate on water resource management and water sharing. It appears to have authority in Uganda to manage water resources, though it is unclear whether it has the same authority in other member states. One of the aims is to create a Nile Basin Decision Support System, comprising a single information management system, and institutional frameworks to share information about management, water resources, and take, in order to inform planning.

The Africa-European Union Water Initiative is a joint project to report on five river basins, including recommending monitoring programs and Integrated Water Resources Management regimes, which include community engagement and public reporting. Three of the basins: Volta, Niger and Lake Chad have had reports completed in 2004, and it appears no further action has been taken.

The Africa Water Atlas is a once-off report prepared by the United Nations Environment Programme in cooperation with the African Union Commission, Africa Ministers' Council On Water European Union, U.S. Department of State and United States Geological Survey. It includes catchment level quality and quantity information, as well as country-by-country water availability and withdrawals, irrigation and water use by sector. It is intended to inform political discussions and lead to increased cooperation to develop water resources in Africa, in particular with reference to the Millennium Development Goals and the subsequent Africa Water Vision 2025, which sets out development goals. It does not appear to have been prepared according to a standard.

While market research reports do exist for some regions of Africa (Algeria, Egypt), this paper could not identify any regular publicly-available water information reports or any standards for reporting on water information in the countries identified above.

9.4 South Africa

South Africa formally recognised the right of access to water at the constitutional level, where it underpins the water law and policy framework[20]. The two main acts are the *1997 Water Services Act (WSA)* and the *1998 National Water Act*. The Constitution allocates the management of water resources to the national government, while local governments (municipalities) are responsible for the management of water and sanitation services.

Recent water reforms attempted to reduce the over-allocation of water to license-holders, and implement a redistribution of water licenses – which were previously linked to land titles. The legal system is in place; however there is a need to improve the quality of water information, such as water assessment and water accounting. This will help justify the reserve put aside for environmental and consumptive purposes and evaluate the success of the new water sharing policy.

18 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

19 United Nations World Water Development Report 3 (2009) (page 92)

20 For more details about the water rights in South Africa, see Appendix 1.

This is recognised in the water management plans, which include the objectives:

- Water user associations implement accurate and reliable water accounting and auditing systems to curtail water losses and implement appropriate remedial actions where problems are experienced along the water distribution systems
- General public awareness of water issues and the need to protect and conserve the natural resources for now and future generations.

The South African Department of Water Affairs and Forestry produces an annual 'State of Water Resources' report, reporting compliance with the *1998 National Water Act* on a national scale. However it does not appear to be published as a unique document, but is incorporated into the 'National State of the Environment Report', which includes contextual information and information such water use, water resources for both surface and groundwater, and the legislative framework[21].

Statistics South Africa also publish water accounts using the UN's SEEAW standard, which have the aim of quantifying the economic value of water as an input to the economy, and in providing environmental services.

It can be seen in South Africa – from the evidence above and the fact that bulk water service provider Amatola Water have already piloted the Preliminary Australian Water Accounting Standard – that there is great potential for further collaboration with WASB on the development of water accounting.

21 This information is not reporting using any type of water accounting standard.

10. East Asia

10.1 China

In a presentation on 7 August 2007, the head of the Australian National Water Commission (NWC) suggested 'water data and accounting' was an appropriate area for cooperation in water resource management through the Australia China Environment Development Program Australian Partners Network. This was followed up in July 2009 by an Australian delegation to China, which confirmed opportunities with the Chinese Ministry of Water Resources for cooperation including recording and reporting mechanisms for environmental water management.

There is a significant amount of information included in the annual report of the Chinese Department of Water Resources. It is primarily contextual information though also includes volumetric figures, infrastructure information, key events during the year, and information about the organisation. Some compliance information is included in a sister report: the annual 'Statistic Bulletin on China Water Activities', although the focus of the latter report is on infrastructure investment and spending. It is unclear whether this information is reported according to a standard; however the Department of Water Resources is responsible for publishing and implementing standards and codes for the water sector, as well as water resource management.

Noting the situation of water stress in the northern and western areas of China, a water sharing plan that recognises water rights and an in-principle agreement between the Australian National Water Commission and the Chinese Department of Water Resources to cooperate on water accounting, there is definitely scope for further discussion with China on the development of water accounting.

10.2 Other developing countries

In several countries in East Asia there is a water sharing plan[22] that recognises water rights and other claims although there is very little overlap with those areas that are under water stress[23]. Only in China are both these conditions met. This suggests that the requisite interest and institutional capability necessary to employ water accounting standards may not be in place in other countries in East Asia.

For the regionally-significant Mekong River Basin, a multilateral planning organisation – the Mekong Basin Commission – has been formed to develop, monitor and report on a resource management plan. It is funded by a combination of participating countries' government funding and development aid funding (including AusAID), and publishes an annual report, and annual flood information, but no compliance report or volumetric use information. While the Mekong River Basin is not under stress, there are water quality and water sharing issues that suggest a potential need for water accounting standards.

The multilateral organisation Association of South East Asian Nations (ASEAN) produced the 'State of Water Resources Management in ASEAN' report in 2005, which includes contextual, volumetric and performance information. It recommends the development of a consistent water resource management dataset. There is no mention of standardised reporting of water information as output of this planned dataset; however there is mention of standardised inputs, by way of improved questionnaires to send to information providers, i.e. a rules-based standard. This is not a regular, ongoing report and no other regular public-available reports were identified.

22 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

23 United Nations World Water Development Report 3 (2009) (page 92)

11. Australasia

11.1 New Zealand

The main responsibility for allocating water under the Resource Management Act 1991 (RMA) is exercised by regional councils. Currently water sharing plans are not compulsory but the majority of regional councils either have an operative plan or are in the process of developing one. Water is allocated between uses under the resource consent process[24]. The proposed National Policy Statement for Freshwater Management will introduce national policy frameworks that will guide the creation of a new RMA, which will continue to be set and managed by local councils.

The report 'Environment New Zealand 2007' is the second in a semi-regular (every 10 years) series of reports on the environment that includes a chapter on freshwater and freshwater use. It includes contextual information, environmental indicators relating to quality and demand, trends and relevant regulation. Its focus is mostly on water quality, although there is some volumetric information relating to use and allocation. Quarterly reports on performance against national environmental indicators are also published by the Ministry for the Environment. The main driver producing such reports appears to be the evaluation of government policy and resource sharing plans.

Currently, water information reporting must follow legislated guidelines 'Resource Management (Measurement and Reporting of Water Takes) Regulations 2010', which do not specify a reporting standard, but impose minimum requirements on the holders of certain water permits to keep and provide records of fresh water taken under the permits. There is a proposed water information standard that does not relate to producing water accounting reports, the 'National Environmental Standard for Measurement of Water Takes'.

It can be seen that in New Zealand there is a water sharing plan that recognises water rights and other claims, however there is no situation of water stress. Information about water resources is already provided, although not as annual reports. As such, New Zealand has aptitude to collaborate on the testing and development of AWAS, although the impetus to do so is not apparent.

24 For more details about this process, see Appendix 1

12. Central and South Asia

In all the countries in South and Central Asia where there is water stress[25] – except for Afghanistan – there is a water sharing plan[26] that recognises water rights and other claims. It would seem that in the countries with water sharing plans but no water stress (i.e. Armenia, Azerbaijan, Seychelles) the opportunities for cooperation with WASB are indistinct.

For the regionally-significant Aral Sea Basin, the Interstate Coordinating Water Commission of Central Asia (ICWC) has been formed to develop, monitor and report on a resource management plan. It is funded by a combination of participating countries' government funding and development aid funding, and does not appear to publish information, although it does collect water resource and water use information. One of the goals is to establish a unified system of water accounting and monitoring of river water flows. The Aral Sea Basin is under significant stress, and there are water quality and water sharing issues that suggest the opportunity for the application of water accounting.

The South Asia Water Initiative (SAWI) is a joint AusAID-World Bank program, aimed at building capacity for water resource management to address serious water availability issues in Himalayan watershed countries of Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan. It supports research and project preparation work across the mainland South Asian countries and assists the establishment of a knowledge forum to facilitate joint research and sharing of water resource management information in the South Asia region. While it is aimed at enabling water resource management, rather than performing it or preparing reports on water resources, it may provide an opportunity to apply AWAS in new situations, where availability of water information is a key consideration for any new development project proposals.

12.1 India

At the federal level the Ministry of Water Resources is responsible for development, conservation and management of water as a national resource. It also oversees the regulation and development of inter-state rivers. Water being a state resource, the administrative control and responsibility for development of water rests with the various state departments and corporations.

Some specific action items proposed in the National Water Mission policy document include establishing a comprehensive water data base in the public domain and assessment of the impact of climate change on water resources by 2012, including the preparation of water accounts. As such, there is an interest in improving the existing water monitoring network however the publication of this information is not recognised as a priority. That this is a priority, particularly at the state government level, is confirmed in a recent KPMG review of the water sector in India[27].

In 2009, a National Ganga River Basin Authority was established, with responsibility for planning, financing, monitoring and coordinating the state and national efforts to improve water quality, ensure minimum ecological flows, allow sustainable access and other issues relevant to river ecology and management of the Ganges River.

In India, there appears to be several state-level water sharing plans, and a national plan for the Ganges River that recognises water rights and other claims. There is also significant water stress in certain areas of the country, suggesting a possible demand for water accounting standards.

25 United Nations World Water Development Report 3 (2009) (page 92)

26 Status Report on Integrated Water Resource Management and Water Efficiency Plans, UN Water, May 2008 (pages 22-25).

27 Water Sector in India: Overview and focus areas for the future, KPMG, 2010

13. Non-government Organisations (NGOs)

13.1 United Nations

A widely accepted standard for water accounting is the System of Environmental-Economic Accounting for Water (SEEAW), published in 2007 by the United Nations. In 2008, SEEAW was used by 17 countries to compile water accounts[28]. It is a key element of the International Recommendations for Water Statistics (2010), from the United Nations Statistics Division. It links into all water-related United Nations programs such as the implementation of Integrated Water Resources Management, the World Water Assessment Program and the Food and Agriculture Organisation of the United Nations (FAO). Key non-UN adopters include the World Meteorological Organisation, the Statistical Office of the European Communities (Eurostat), the European Environmental Agency and the Organisation for Economic Cooperation and Development (OECD).

SEEAW is a conceptual framework that describes a set of standard tables that constitute a minimum data set for countries to compile. It also includes a set of supplementary tables that are not directly linked with the other statistical standards mentioned above.

The standard set of tables includes the following information:

- Standard physical supply and use tables for water (i.e. abstraction by industry group)
- Emission accounts (i.e. pollution, wastewater)
- Hybrid supply and use tables (i.e. physical and monetary units)
- Asset accounts (i.e. physical stocks and flows).

There are several areas of water information that have not been included in SEEAW[29], but are recognised as areas of future work:

- Water quality
- Environmental flows
- Water rights
- Water incorporated into products
- Further integration of water data with social-demographic statistics and other statistics fields.

The Food and Agriculture Organization (FAO) of the United Nations maintain a global information system on water and agriculture called Aquastat. Its main mandate is to collect, analyse and disseminate information on water resources, water uses, and agricultural water management with an emphasis on countries in Africa, Asia, Latin America and the Caribbean.

FAO do not publish a water report as a regular standalone publication, but do publish periodic reports such as the 'Review of World Water Resources by Country (2003)'. In addition, water information is used in all of its flagship reports, and information from Aquastat is often used to inform decisions in those countries/areas where water information may not otherwise be available.

FAO has extensive experience in selecting, assessing and assuring water information. This means, in addition to the FAO reports offering a potential new application of the AWAS, FAO may also provide WASB an opportunity to gain valuable insight into the future development of water accounting.

28 Global Assessment of Water Statistics and Water Accounts, UN Statistics Division, February 2009.

29 International Recommendations for water statistics, United Nations Statistical Commission, Agenda Item 3(h) 41st session, 23-26 February 2010, pp6-7

Regular water information reports produced by the United Nations include the following:

- United Nations Children's Fund (UNICEF) Multiple Indicator Cluster Survey
- United Nations Statistics Division/United Nations Environment Programme Water Questionnaire
- World Health Organisation (WHO) Global Annual Assessment of Sanitation and Drinking Water
- World Water Assessment Program (compilation of existing data by UN Water).

13.2 World Bank

The World Bank publishes a large number of water-related report, chiefly performance and compliance audits on projects it has funded. The most prominent of these is the 'International Benchmarking Network for Water and Sanitation Utilities (IB-NET)'.

Lending for water resources development and water-related services accounted for 16 percent of all World Bank lending for the period 1994–2004[30]. Its interest is broad, including economic development, environmental flows, the basic right to water and sanitation, water resource planning and management.

Increasing the accountability of on-the-ground water managers is a significant part of the water resources sector strategy. The World Bank's position on reporting standards is to apply them where appropriate – i.e. where it is reasonable to expect a certain standard, and not a blanket approach. While standard methods are used to assess economic, environmental and institutional costs, risks and benefits, it is unclear as to whether they use one standard to guide their reporting and assurance of water-related information specifically.

As there is considerable interest in water information and the broad acceptance of water-related standards, the World Bank may be an appropriate partner in bringing the work of WASB to a wider audience. Further, due to their considerable expertise in reporting water information and performing assurance functions, they may provide meaningful cooperation opportunities for the future development of AWAS.

13.3 Organisation for Economic Cooperation and Development (OECD)

The OECD/Eurostat Questionnaires on the State of the Environment were an attempt to set up world-wide coherent data collections on the main environmental issues in 1980 by OECD, with Eurostat joining in 1988. The most recent questionnaire was completed in 2008.

OECD collects information on potable surface and groundwater, wastewater and recycled water. It is survey-based, and has a manual outlining data collection methods, definitions, modelling and other methodological standards that would be applied in a best practice scenario.

There is a strong emphasis on quality-assuring data, and it provides some benchmarking tools that may be particularly relevant to the development of an assurance standard. As such, they are a potential partner for future cooperation with WASB.

13.4 Ramsar Convention

The Ramsar Convention is a significant multilateral agreement, with 160 contracting states, that designates 1896 wetlands of international importance and sets management and compliance requirements to ensure they are adequately protected. This includes reporting to the Ramsar secretariat, as well as triennial Ramsar Conference reports, on information about changes in the ecological character of designated sites in a transparent manner. These reports must be prepared following a specified format defined by the Strategic Plan of the Convention, which lists the key points of focus and therefore what information should be included. It is not a reporting standard; however it does recognise the need for better quality and more timely reports to be produced by 2015. There are no punitive inducements, but there is a reputation risk for states who do not comply.

30 Water Resources Sector Strategy, The World Bank, 2004

As there is considerable interest in water information and the requirement to improve the quality of water reports, the Ramsar Convention find the application of water accounting standards an effective tool in ensuring transparent, comparable and quality information is included in their water information reports.

13.5 Global Reporting Initiative

The GRI Water Performance Indicators are intended to assist organisations (principally corporations) in reporting water-related information, with the aim of including this information as non-financial disclosures in an audited annual report. They are prepared according to a principles-based standard (GRI Guidelines G3), and water is included along with other environmental information. More than three-quarters of Global Fortune 250 companies (the G250) and nearly 70 percent of the 100 largest companies by revenue (the N100) used the GRI Guidelines in the financial reporting year 2007–08[31].

As considerable expertise and stakeholder consultation has gone into this widely-adopted standard, WASB would be well advised to consult further with this group to gain some insights into what sort of information is considered important to disclose from a corporate point of view.

13.6 Water Footprint Network

The Water Footprint Network is a Netherlands-based academic program supported by the UNESCO Institute for Water Education, and WWF International Global Freshwater Programme. A "water footprint" is a measurement of the use of water by an individual, community or business, measured as the total volume of freshwater that is used to produce goods and services consumed by the individual or community (as per water/capita/year) or produced by the business (e.g. 3000 litres of water for 1 kilogram of rice). The Water Footprint Requirements and Guidelines will be released in 2010, with the aim of harmonising the water footprint metric with existing terminology and other environmental metrics recognised by the International Organisation for Standardisation.

The Water Footprint metric measures water consumed in the production and use of a product throughout its life-cycle, without information on availability or contextual information. By aggregating water from different sources, of different qualities and values, it does not provide information that is useful to users assessing the management of water resources by a water report entity, so the Water Footprint Network may be too dissimilar to AWAS to provide any insights for future development of AWAS.

31 KPMG International Survey of Corporate Responsibility Reporting 2008

Appendix 1: (Glossary of types of water right)

Water right	Country/Area used	Description
Riparian	United Kingdom, USA (eastern states), Canada (Ontario, Maritimes)	The riparian doctrine permits anyone whose land has frontage on a body of water to use water from it. The law followed the principle of equality which requires that the corpus of flowing water become no one's property and that, aside from rather limited use for domestic and agricultural purposes by those above, each riparian owner has the right to have the water flow down to him in its natural volume and channels unimpaired in quality. Water for irrigation or manufacture on the land is permitted as long as the water is returned to its source in similar quantity and quality after use. The riparian system does not permit water to become property which may be carried away from the stream for commercial or non-riparian purposes.
Prior Allocation	USA (western states), Canada (British Columbia, Alberta, Saskatchewan, Manitoba, Nova Scotia)	Under the prior appropriation doctrine, water rights are unconnected to land ownership, and can be sold or mortgaged like other property. The first person to use a quantity of water from a water source for a beneficial use has the right to continue to use that quantity of water for that purpose. Subsequent users can use the remaining water for their own beneficial purposes provided that they do not impinge on the rights of previous users. Each water right has a yearly quantity and an appropriation date. Each year, the user with the earliest appropriation date (known as the "senior appropriator") may use up to their full allocation (provided the water source can supply it). Then the user with the next earliest appropriation date may use their full allocation and so on. When a water right is sold, it retains its original appropriation date. For water sources with many users, a government or quasi-government agency is usually charged with overseeing allocations. Allocations involving water sources that cross state borders or international borders can be quite contentious, and are generally governed by federal court rulings, interstate agreements and international treaties.
Public Authority	Canada (northern states)	A Public Authority makes decisions about water use that is then implemented by local water boards. All uses of water require a permit, with the exception of domestic and emergency uses. This approach possesses a "use-it-or-lose-it" nature, and licenses may be cancelled or amended if it is in the public interest (e.g. in drought situations).
Civil Code	Canada (Québec)	The Civil Code of Québec is a legal document passed by the legislature that establishes the use of all water resources (surface and groundwater) as 'common to all'. The government has a responsibility to regulate water use, establish priority use and preserve its quality and quantity, while taking the public interest into account. Rather than having a single agency governing water allocations, permits for water are granted by several ministries that each regulate some use of water. As such, the government departments responsible for agriculture, municipal affairs, and others operate separate licensing systems. Water rights transfers are prohibited.

Water right	Country/Area used	Description
Quota	Israel	Water licenses are issued annually by the Minister for National Infrastructure. Agricultural water users are allocated a quota based on farm size, soil type and water production type (treated waste, rain, diversion, etc.). Industrial water users are allocated a quota based on product and scope of production. Human potable water supply companies are allocated a quota based on the number of users, and are not allowed transmission losses greater than 12 per cent or they face fines and restrictions.
Falaj	Oman	The falaj irrigation system consists of an underground tunnel that taps groundwater aquifers and guides them to the surface along a channel at a lesser gradient than the water table until it reaches the surface, where it runs along channels to individual farms. Water allocations are either held in perpetuity or rented as needed by farmers by way of a market auction, and are measured in time units, not volumes.
Constitutional Right to Water	South Africa	The right to water is recognised as a basic human right in the constitution. The nation's water resources are de-linked from land ownership, replacing the private ownership regime of pre-apartheid, whereby a majority of the water resources was held by a minority of the population. The national government acting through the Minister of Water Affairs and Forestry is the public trustee and must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons, and in accordance with its constitutional mandate. In order to enact this objective, there is a 'reserve' put aside to protect basic human and ecological needs, which is the only right to water in the National Water Act. The remaining water is then allocated to users by way of licenses. These licenses are not tied to land ownership, but are for specific uses, e.g. agricultural.
Resource Consent Process	New Zealand	The process operates under a volumetric, first-in first-served system, operated by regional councils. In granting an allocation (i.e. a water permit) the focus is on avoiding, remedying or mitigating adverse environmental effects and the potential impact on existing permit holders. Permits can be granted for up to 35 years, or for five years if no period is specified. They may be cancelled by a regional council if not exercised for a continuous period of two or more years. Permits may lapse if not given effect to within five years of the grant, unless the consent specifies a different period or an extension is granted. Water permits do not run with the land but are personal to the consent holder at the site specified, and can be transferred to another site within the same catchment/aquifer as permitted under the water sharing plan. Although, this has not been included in the vast majority of plans to date, where transfers have been allowed it has only been in limited circumstances.

Appendix 2: (Table of criteria met by entity)

Entity	Is water a scarce resource in the area?	Is there a water sharing plan in place in the area that recognises water rights and other claims?	Does the area regularly publish water information reports?	Are the water information reports produced in accordance with a standard?	Is corporate responsibility reporting commonplace?	Total score
South Africa	5	5	3	5	3	21
Canada	2	5	5	4	4	20
European Union	2	5	4	3	3	17
United Nations	3	5	4	3	2	17
Spain	4	5	3	5	–	17
OECD	3	5	4	4	–	16
World Bank	3	5	4	1	1	14
Mexico	3	5	5	1	–	14
Nile River Basin	4	5	4	–	–	13
Namibia	5	5	3	–	–	13
Israel	5	5	3	–	–	13
Botswana	5	5	3	–	–	13
Peru	4	5	3	–	–	12
Danube River Basin	2	5	5	–	–	12
China	3	5	3	1	–	12
Aral Sea Basin	4	5	2	1	–	12
Tunisia	4	5	2	–	–	11
Jordan	5	5	1	–	–	11
Egypt	3	5	3	–	–	11
Syria	5	5	–	–	–	10
Oman	5	5	–	–	–	10
Lesotho	5	5	–	–	–	10
Algeria	5	5	–	–	–	10
Uzbekistan	4	5	–	–	–	9
Turkmenistan	4	5	–	–	–	9

KEY:
– = no data, 1 = not at all, 2 = very little, 3 = to some extent, 4 = to a significant extent, 5 = yes

Entity	Is water a scarce resource in the area?	Is there a water sharing plan in place in the area that recognises water rights and other claims?	Does the area regularly publish water information reports?	Are the water information reports produced in accordance with a standard?	Is corporate responsibility reporting commonplace?	Total score
Philippines	1	5	3	–	–	9
Pakistan	4	5	–	–	–	9
New Zealand	1	5	3	–	–	9
Mekong River Basin	1	5	3	–	–	9
Mali	4	5	–	–	–	9
Kyrgyzstan	4	5	–	–	–	9
Kazakhstan	4	5	–	–	–	9
Iraq	5	1	3	–	–	9
Guatemala	1	5	3	–	–	9
Global Reporting Initiative	3	1	5	–	–	9
Dominican Republic	1	5	3	–	–	9
Argentina	4	5	–	–	–	9
USA	3	5	–	–	–	8
Turkey	1	5	2	–	–	8
Ramsar Convention	3	1	4	–	–	8
India	2	5	1	–	–	8
Armenia	1	5	2	–	–	8
United Arab Emirates	5	1	1	–	–	7
Ukraine	3	1	3	–	–	7
Malaysia	1	5	1	–	–	7
Italy	3	1	3	–	–	7
Indonesia	1	5	1	–	–	7
Brazil	1	5	1	–	–	7

KEY:
– = no data, 1 = not at all, 2 = very little, 3 = to some extent, 4 = to a significant extent, 5 = yes

Entity	Is water a scarce resource in the area?	Is there a water sharing plan in place in the area that recognises water rights and other claims?	Does the area regularly publish water information reports?	Are the water information reports produced in accordance with a standard?	Is corporate responsibility reporting commonplace?	Total score
Bangladesh	2	5	–	–	–	7
Azerbaijan	1	5	1	–	–	7
Zimbabwe	1	5	–	–	–	6
Zambia	1	5	–	–	–	6
Yemen	5	1	–	–	–	6
Viet Nam	1	5	–	–	–	6
Uganda	1	5	–	–	–	6
Togo	1	5	–	–	–	6
Thailand	1	5	–	–	–	6
Tanzania	1	5	–	–	–	6
Tajikistan	1	5	–	–	–	6
Taiwan	1	5	–	–	–	6
Swaziland	1	5	–	–	–	6
Sudan	1	5	–	–	–	6
Seychelles	1	5	–	–	–	6
Serbia	1	5	–	–	–	6
Saudi Arabia	5	1	–	–	–	6
Nicaragua	1	5	–	–	–	6
Mozambique	1	5	–	–	–	6
Morocco	1	5	–	–	–	6
Mauritania	1	5	–	–	–	6
Malawi	1	5	–	–	–	6
Libya	5	1	–	–	–	6
Liberia	1	5	–	–	–	6
Lao PDR	1	5	–	–	–	6
Kenya	1	5	–	–	–	6

KEY:
– = no data, 1 = not at all, 2 = very little, 3 = to some extent, 4 = to a significant extent, 5 = yes

Entity	Is water a scarce resource in the area?	Is there a water sharing plan in place in the area that recognises water rights and other claims?	Does the area regularly publish water information reports?	Are the water information reports produced in accordance with a standard?	Is corporate responsibility reporting commonplace?	Total score
Jamaica	1	5	–	–	–	6
Iran	5	1	–	–	–	6
Honduras	1	5	–	–	–	6
Grenada	1	5	–	–	–	6
Ghana	1	5	–	–	–	6
Germany	2	1	3	–	–	6
Ethiopia	5	1	–	–	–	6
Eritrea	1	5	–	–	–	6
Cyprus	4	1	1	–	–	6
Cuba	1	5	–	–	–	6
Croatia	1	5	–	–	–	6
Cote d'Ivoire	1	5	–	–	–	6
Costa Rica	1	5	–	–	–	6
Chile	4	1	1	–	–	6
Cambodia	1	5	–	–	–	6
Burkina Faso	1	5	–	–	–	6
Bulgaria	3	1	2	–	–	6
Belgium	2	1	3	–	–	6
Angola	1	5	–	–	–	6
Albania	1	5	–	–	–	6
Senegal	4	1	–	–	–	5
Mongolia	4	1	–	–	–	5
Malta	4	1	–	–	–	5
Ecuador	4	1	–	–	–	5
Bolivia	4	1	–	–	–	5
Afghanistan	4	1	–	–	–	5

KEY:
– = no data, 1 = not at all, 2 = very little, 3 = to some extent, 4 = to a significant extent, 5 = yes

Australian Government

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