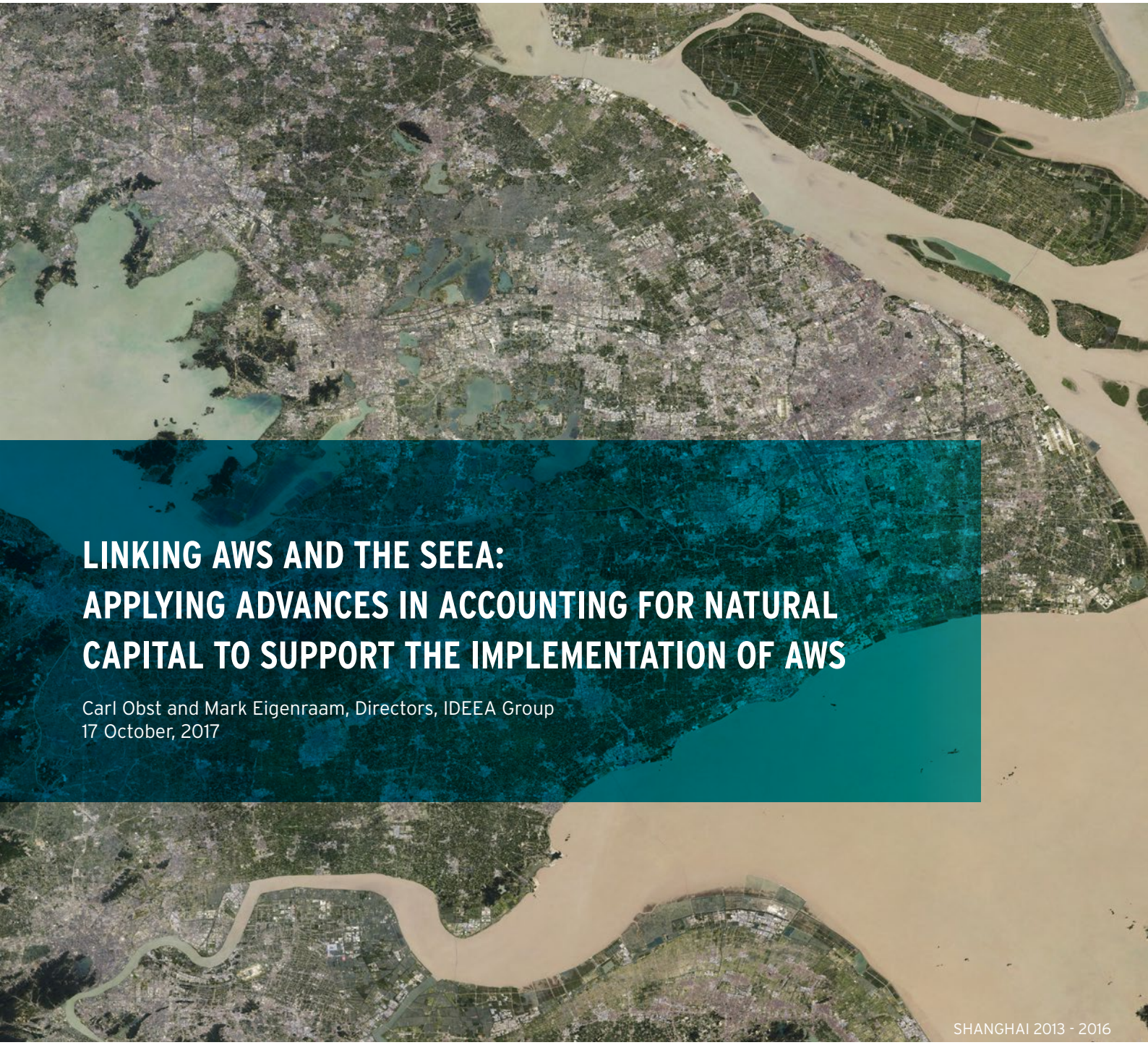

LINKING AWS AND THE SEEA: APPLYING ADVANCES IN ACCOUNTING FOR NATURAL CAPITAL TO SUPPORT THE IMPLEMENTATION OF AWS

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IDEEA Group

Australian Aid

THE AUSTRALIAN WATER PARTNERSHIP

ALLIANCE FOR WATER STEWARDSHIP
ASIA PACIFIC

FOREWORD

This report set out to address two challenges facing the AWS Water Stewardship system; (1) our desire to integrate with existing systems that are meaningful to our stakeholders and, (2) our desire to demonstrate impacts in a way that can position AWS Water Stewards as good businesses and natural capital managers. In that regard, linking AWS Water Stewardship to a global system such as the System of Environmental-Economic Accounting (SEEA), that is being increasingly adopted by governments around the world, is an important step in meeting these challenges. This report is the beginning of a journey, not an end. In that regard, we are hoping to build on the work that is presented here to develop a deeper understanding and test the linkages established in this report through practical applications and examples.

Much of our work in the Asia-Pacific involves close collaboration with agencies that have responsibility for natural resource management. For them, the goal is to engage businesses and others, who have traditionally stood apart from water management, in addressing the challenges of water and catchment management. Being able to demonstrate to government that Water Stewards are delivering public as well as private benefits will encourage natural resource management agencies to reward participation in a way that adds to the business case for good water stewardship. This will encourage the uptake of AWS Water Stewardship, strengthening win-win outcomes for both public and private sector interests.

We were delighted that Carl Obst and Mark Eigenraam from IDEEA Group were prepared to take-on this assignment as both have been leading the development and application SEEA at national and sub-national levels globally. They are highly respected for their work and their advice is sought by government and business internationally. Both IDEEA Group and AWS share a desire to see greater integration of social and environmental programs with a focus on language, definitions and data. It is quite reasonable to aim for greater simplicity in a complex world, but we are often guilty of fragmented thinking, policies and actions. This can reduce benefits, or worse, lead to perverse impacts. Integrated thinking allows us to understand relationships and, as a result, achieve more sustainable outcomes.

I thank Carl and Mark for their work on this report and hope it makes a useful contribution to the ongoing development of AWS Water Stewardship.

Michael Spencer

CEO, AWS Asia-Pacific

EXECUTIVE SUMMARY

In less than three years, Water Stewardship Australia and its strategic partner, the The AWS International Water Stewardship Standard (the AWS Standard) adopted in April 2014, provides a systematic approach for companies to improve their water use and the quality of their involvement in the management of water resources. The ambitions of the AWS Standard imply recognising a connection between site and firm level information and plans with respect to water and more aggregated data at catchment level and above.

In parallel, the international statistical community has worked progressively towards the adoption of the System of Environmental-Economic Accounting (SEEA) framework in which a wide array of data relating to environmental stocks and flows, including water, are integrated with economic data to provide a more complete picture of the relationship between human activity and the environment. In providing international standards the general focus has been on national or large jurisdictional level reporting. However, more recent work to incorporate information on ecosystems and biodiversity, has shown the capacity for SEEA to be applied at finer scales, including at catchment and finer scales.

Measurement and evaluation is a central feature in the "6 step" continuous improvement approach of the AWS Standard. This paper examines the potential to make connections between the measurement framework and approach of the SEEA and the information designed and collected for the AWS Standard. It also considers the role that SEEA can play in establishing a broader context for implementation and communication of the AWS Standard.

In broad terms, there are four key connections that enable the SEEA and the AWS Standard to be linked. These are through the provision of:

- context
- classifications and boundaries for measurement
- support for impact analysis and evaluation
- accounting and reporting structures.

The paper finds clear potential for a number of benefits to accrue at firm and site level from the application of SEEA based measurement standards. Key benefits emerge from the SEEA's potential to integrate information on water resources with data on other environmental stocks and flows and on economic activity. This means it can support a discussion of different planning options at the firm level. This can drive context-based, target setting and best practice, rather than more simply applying industry wide benchmarks of, for example, water use.

Further, since the SEEA is being applied in an increasing range of situations, well-beyond water resources, there is a higher chance of engaging in a commonly understood way beyond the AWS Standard, for example, with regard to biodiversity and land use change.

More broadly, data integration provides the system-wide information that limits the potential for unintended consequences from operational decisions and reflects the principles of Integrated Water Resources Management (IWRM).

From a measurement perspective, the SEEA represents a single, internationally agreed standard and is further underpinned by the International Recommendations for Water Statistics. The use of these statistical standards by firms implementing the AWS Standard would therefore be of direct benefit in:

- ensuring the ability to use data from public data sources where SEEA based data are compiled
- increasing the potential for comparison across sites and catchments, and across scales
- improving the alignment of data across different aspects of water resources measurement (e.g. between condition of water resources and the condition of important water related areas (IWRA))
- supporting consistent messages on the status of water resources from site level to catchment and national level
- reducing costs of data collection and reporting where multiple streams of reporting are required
- reducing associated costs of training and data infrastructure development that can be more easily shared.

While the focus of the paper is on the potential for the SEEA to support implementation of the AWS Standard, the reverse is also true. That is, to the extent that a given entity or catchment adopts the AWS Standard and uses the SEEA framework to underpin measurement, there is a clear potential for the information collected through the AWS Standard to be further utilised in the generation of SEEA based accounts – particularly water and ecosystem accounts – at higher scales. This is logically the equivalent of utilising corporate financial information to support the measurement of economic activity at the national level.

Given this range of connections and benefits, it is recommended that a variety of case studies be established at site, catchment and sector scales to further identify and demonstrate the potential described in this paper.

1 INTRODUCTION

The environment, our natural capital, is a resource that is used and managed by individuals, corporations and governments. Our capacity to continue to secure the benefits we receive from the environment relies on the availability and sustainability of our natural capital base. Natural capital has both private and public dimensions that are reflected in different perceptions, management and decision-making approaches. These differences often lead to overuse and poor management of natural capital at both global, local and farm scales.

The challenge of improving our management of natural capital and securing the benefits we obtain from it for current and future generations has been, and continues to be, tackled by many different groups and from many different perspectives. While there is a common motivation, often the different initiatives and projects become isolated and struggle to find broader resonance beyond an immediate group of stakeholders. A key barrier to progress is finding a common language through which the different perspectives and experiences can be exchanged. The reality is that improved management of natural capital requires an inter-disciplinary and multi-sector approach – one group cannot make widespread progress alone.

There is a range of benefits to stakeholders, at site and catchment level, from pursuing more harmonised approaches to measurement. These include the capacity to compare performance among sites, across countries, among firms and between industries, the capacity to exchange and utilise data from different scales (e.g. from large jurisdictional scales to site level), and the potential to ensure connection between site level management information and the broader communication of water stewardship performance.

This paper demonstrates the potential for the integration of advances in two separately conceived initiatives but both having the aim of improving the decision making and on-going management of natural capital. The two initiatives are the International Water Stewardship Standard developed by the Alliance for Water Stewardship (AWS), referred to as the AWS Standard, and the System for Environmental-Economic Accounting (SEEA) developed by the international official statistics community under the auspices of the United Nations Statistical Commission (UNSC).

The paper commences with a brief introduction to both the AWS Standard and the SEEA and summarises the common areas of interest. The paper then demonstrates in some detail the ways in which the accounting framework described in the SEEA can be used to support implementation of the six steps of the AWS Standard. It also describes ways in which implementation of the AWS Standard might support development of SEEA based accounts. Through this discussion, the paper provides a basis for testing potential applications in practice, including the identification of case studies at firm, sector and catchment scales.

2 THE AWS AND THE INTERNATIONAL WATER STEWARDSHIP STANDARD

Growing populations and economies, changing lifestyles, and global climate change are all increasing the pressure on the planet's water resources. People and nature alike are threatened by a lack of responsible water management. Our globalized world demands an international approach to water that can be applied consistently across regions and sectors, yet recognizes the local nature of water. The Alliance for Water Stewardship (AWS) aims to address the major water challenges in a sustainable way, using collective approaches, through which water users work together to identify common goals for sustainable water management.

The AWS was formed in 2008 as three organizations – The Nature Conservancy, The Pacific Institute and Water Stewardship Australia – came together with the mission to promote water stewardship. Over time, these three organizations have been joined by CDP, European Water Partnership, Water Environment Federation, Water Witness International, WWF, United Nations Global Compact's CEO Water Mandate and the United Nations Environment Programme to form a board. AWS subsequently incorporated as a Scottish Charitable Incorporated Organisation (SCIO), based in Edinburgh Scotland, with an open multi-stakeholder membership of more than 70 large and small organizations.

In 2010, AWS initiated the development of the first International Water Stewardship Standard ("AWS Standard" or "the Standard") via the Water Roundtable (WRT) process (http://www.allianceforwaterstewardship.org/what-we-do.html - water-roundtable). The first version of the AWS Standard was released in 2014 and involved extensive consultation with a wide range of stakeholders including businesses and water service providers, civil society, and public-sector agencies and from across eight regions (Africa, Asia-Pacific, Europe, Latin America and the Caribbean, North America, Northern Asia, South Asia, and Western and Central Asia). It is currently going through a review process as anticipated when released.

The main focus of the AWS Standard is on water stewardship as undertaken at a site level within a defined catchment. The focus at this local level is most meaningful for adopting practices suited to the particular context but equally places a challenge in ensuring comparability both across sites and with other activity within the catchment.

The AWS Standard is presented as six steps, listed in the Section 4 below, that describe a process of continuous improvement in water stewardship practices. A fundamental underpinning requirement of the Standard is gathering data, understanding context and evaluation of performance (and compliance with the Standard). In this respect, the relevance of underlying information infrastructure is high. Indeed, the rationale for the AWS Standard is that its implementation can improve both environmental and socio-economic outcomes and hence measuring these outcomes is core to understanding the effectiveness of the AWS Standard itself.

3 THE SYSTEM OF ENVIRONMENTAL-ECONOMIC ACCOUNTING (SEEA)

BACKGROUND

A key feature of the differences between approaches to natural capital management concerns the language – concepts, terms, definitions – that is used to describe and discuss environmental stocks and flows. Thus, central to improving the management of natural capital is having a common language to measure and report on it. Establishing a common language would facilitate a movement towards an agreed framework to account for the use of natural capital and its changing state.

There have been significant advances in recent years towards building a common language. Building on a long history of environmental reporting and national accounting, the United Nations, together with the World Bank, IMF, OECD, FAO and the European Commission, published the System of Environmental-Economic Accounting (SEEA) in 2014 (UN et. al., 2014a & 2014b). The SEEA provides an internationally agreed, accounting-based framework for the recording of a comprehensive and integrated set of environmental data. The framework is fully aligned with the standard approaches used to measure economic activity at the national level, including measures of GDP, productivity, saving and national wealth.

A key feature of the SEEA is the implementation of common terms and definitions to describe a comprehensive set of environmental stocks and flows, including natural resources (e.g. minerals, timber, fish), physical flows (e.g. water, energy, GHG emissions), land and ecosystems, ecosystem services and biodiversity. The four key components of the SEEA are shown in Figure 1. The descriptions are contained in two publications – the SEEA Central Framework (UN et. al. 2014a) and the SEEA Experimental Ecosystem Accounting (SEEA EEA) (UN et. al., 2014b). Both SEEA publications feature accounting for stocks and flows of water resources and their connection to the economy and the surrounding environment. The following sections provide brief introductions.

Figure 1: Components of the SEEA framework

Source: IDEEA Group

Implementation of the various components of the SEEA is a very active area of work at international, national and sub-national level. Work has been undertaken in statistically advanced countries such as Australia, Canada, the EU (as a region), the Netherlands, the UK and the USA, but SEEA implementation is equally, if not more active, in countries such as Botswana, Colombia, Fiji, Guatemala, the Philippines, Peru and Rwanda. An EU funded UN project is also underway to establish ecosystem accounting programs in China, India and Brazil, and to embed advances already present in Mexico and South Africa. Overall, more than 80 countries have active programs of work and accounting for water is a very common focus. Indeed, because of the level of interest in accounting for water resources, there is an extensive set of supporting materials in addition to the conceptual descriptions of the accounting framework.

SEEA AND ACCOUNTING FOR WATER RESOURCES

The starting point for accounting for water in the SEEA is described in the SEEA Central Framework and the companion document, SEEA Water. Both of these documents describe two key water related accounts – a supply and use account for water and an asset account for water resources. Both of these accounting descriptions are aligned with and supported by the International Recommendations for Water Statistics (IRWS).

The supply and use account records all flows of water, in volumetric terms, from "the environment" (i.e. surface water, groundwater, sea water), into the economy, use within the economy (includes volumes of wastewater), and returns to the environment. The supply and use account is structured and defined such that these flows of water can be directly compared within measurement of economic activity such as production, consumption and value-added (GDP), and uses the standard economic definitions of industries and sectors.

The asset account for water resources is a means to record standard hydrological flows and water balances in an accounting format using entries of opening stocks, additions (e.g. precipitation), reductions (e.g. evaporation), and closing stocks across all water sources. The general application is to account for a country's inland water system but the same logic can be applied for different spatial boundaries including for individual catchments and sub-catchments.

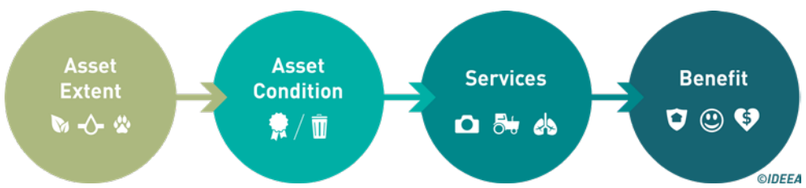
ECOSYSTEM ACCOUNTING

Ecosystem accounting, described in the SEEA EEA and related documents, has been developed as a specific component within the broader SEEA framework over the past 5 years. It responds to calls to ensure the integration of information on ecosystems, biodiversity and ecosystem services with more traditional measurement of natural resources and standard measures of economic activity.

The basic logic of ecosystem accounting is shown in Figure 2 and associated descriptions are included in Box 1. An area that is dominated by a single ecosystem type, e.g. a forest or wetland, constitutes a single ecosystem asset. One asset will supply a number of ecosystem services, and consequently, will provide a range of benefits to a variety of beneficiaries. The objective in ecosystem accounting is to record both (i) the stock and changes in stock of the various assets (measured by extent (area) and condition) and (ii) the flows of ecosystem services and associated benefits. This dual focus has been relatively uncommon with much ecosystem measurement work focusing on either the assets or services but not both.

Most importantly, ecosystem accounting reflects a spatially based approach to accounting and measurement. By defining different ecosystem assets within a broader landscape or catchment, ecosystem accounting recognises that each of these assets can, and must, be the focus of management, and hence information on their extent, spatial configuration and condition, is essential in understanding the capacity of these assets to generate ecosystem services and benefits. Ecosystem accounting thus allows standard accounting and economic concepts of return on investment and productivity, as well as broader notions of sustainability, to be considered in a consistent way at local, national and global scales.

Figure 2: Basic ecosystem accounting model



Source: IDEEA Group

Overall, within an ecosystem accounting framework many pieces of information are drawn together to provide a coherent picture. There is no single ecosystem indicator or valuation that is the sole focus of the approach and a single set of accounting information can be applied to support decision making and communication across a number of areas. This design aligns directly with the aim of the AWS to consider not only water resources but the broader connection between water stewards and the ecosystems that they manage.

Box 1: The key elements of the ecosystem accounting model

i. Ecosystem extent reflects the areas of different ecosystem types each representing a single ecosystem asset. Thus, for example, the different areas of forest, wetland and rivers, within a single catchment constitute individual ecosystem assets. The accounting framework monitors changes in the size (hectares) of each asset over time and the changes in overall composition at the sub-catchment, catchment or broader scale.

ii. Ecosystem condition concerns the condition (quality or health) of each ecosystem asset in terms of changes in specific characteristics. A condition measure based on various metrics (e.g. canopy cover, water quality, species diversity) is measured for each ecosystem asset on an ongoing basis over time. Declines in ecosystem condition relate to ecosystem degradation, while improvements in condition may point to successful intervention and restoration activity.

iii. Ecosystem services reflect the production from each ecosystem asset. The focus in ecosystem accounting is on production of ecosystem services that is used directly by economic units (e.g., the abstraction of water for irrigation or distribution) but also encompasses ecosystem services supplied to the community more broadly (e.g. the regulation of water flows, retention of sediment, processing of pollutants, provision of recreational opportunities).

iv. Benefits emerge from the use of ecosystem services by economic units, including households. With respect to water catchments, the distribution of clean water is a benefit, as are cleaner water through water purification services and reduction in flood risk through water regulation services. Distinguishing between ecosystem services and benefits supports better understanding the role of land managers in relation to beneficiaries and allows a clearer focus for monetary valuation if this is undertaken.

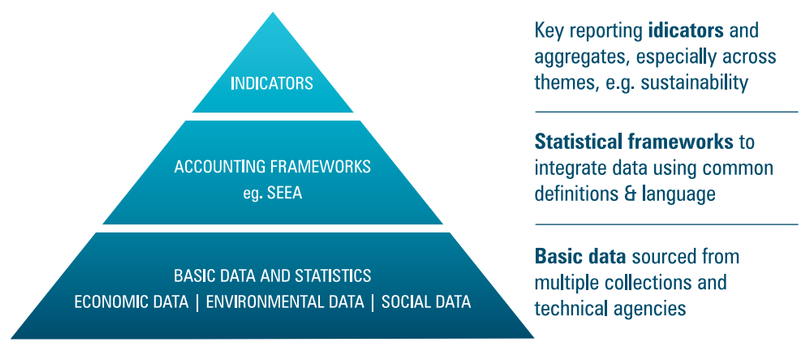
ACCOUNTING AND INDICATORS

Often the role of accounting frameworks with respect to the derivation of indicators is not appreciated, since for any given indicator it is possible to derive it by collecting only the data required directly from the relevant data sources. For example, a measure of water use can be obtained by directly collecting the relevant data at firm or site level.

The value of an accounting framework derives from the fact that it seeks alignment between different data sources such that the indicators that are derived are in effect validated by being integrated and coherent with other information. For example, within an accounting framework a measure of water use should be validated in relation to levels of production and levels of abstraction from local water sources. Accounting requires that all information is integrated to provide a single best picture.

For the derivation of indicators, accounting frameworks act as a filter over the underlying data sources. This can be depicted by way of an information pyramid – Figure 3. In practice, there will be an iterative process in which there is discussion on the indicator needs (which will vary over time based on the decision-making context), the available and required data and the structure and detail of the accounting framework. In general, it would be expected that there would be ongoing changes in the data sources (e.g. due to improvements in monitoring technology) and ongoing changes in the indicator requirements (e.g. due to changes in policy focus) but the accounting framework should be relatively stable over time. It can thus provide a firm base for ongoing derivation of comparable indicators that allows for changes in data sources.

Figure 3: Information pyramid



Source: IDEEA Group, adapted from UN Statistics Division

4 LINKING THE SEEA AND THE AWS STANDARD

INTRODUCTION

The AWS Standard seeks to achieve four outcomes – sustainable water balance, good water quality, healthy important water-related areas and good water governance – and sets out six steps to describe the way in which water-using sites, both private and public, should progress towards improved water stewardship. The steps are:

1. Commit: Commit to being a responsible water steward
2. Gather and understand: Gather site and catchment data to understand shared water challenges and water related risks, impacts and opportunities
3. Plan: Develop a site water stewardship plan to address issues/opportunities identified above
4. Implement: Implement the site's stewardship plan and improve impacts
5. Evaluate: Evaluate the site's performance
6. Communicate and disclose: Communicate about water stewardship and disclose the site's stewardship efforts

The steps can be seen as providing a complete process for advancing water stewardship but also as requiring ongoing management and resolve. Enacting the AWS Standard is not a one-off exercise but rather involves continual assessment and review – a process of continuous improvement (Figure 4).

Figure 4: A WS Process of continuous improvement

The discussion here does not aim to critique the process that has been established in the AWS Standard. Rather the focus is on the ways in which the SEEA can support the implementation of the AWS Standard and leverage the 'common language' of SEEA to add to the relevance and applicability of the AWS Standard. At the same time, it is recognised that there is the potential for data collected through the implementation of the AWS Standard to support the compilation of SEEA based accounts. Further, it is also the case that progress on implementing the objectives of water stewardship, and the clear role for monitoring, evaluation and reporting in a continuous improvement process, directly promotes the role of information frameworks such as the SEEA and their generic capacity to support decision making. In this regard, there is much to be gained through demonstration of the potential links between policy and information frameworks as described in this paper.

Utilising the SEEA to support implementation of the AWS Standard

The rationale for using the SEEA within an AWS Standard context is that the SEEA can:

- Use existing, internationally agreed findings on the measurement and reporting of environmental stocks and flows;
- Support comparison and benchmarking within and across businesses, industry sectors, catchments and countries;
- Integrate internal management and decision making around natural capital;
- Support the use of public environmental information datasets at corporate level and the exchange of data from the corporate level to catchment and higher levels of aggregation; and
- Encourage consistency in information and communication at public and private levels.

The SEEA has been developed as an international statistical standard and hence will underpin the collection and publication of official statistics. Work on the implementation of the SEEA in recent years has also highlighted that the SEEA provides a common basis for framing the discussion of environmental stocks and flows in decision making contexts. In the context of implementation of the AWS Standard this can support moving beyond considering only data on the quantity and quality of water resources, but also using the SEEA framework as a means by which that information can be related to other environmental and economic information. As discussed further below, this supports a much wider discussion of the ways in which accounting for natural capital can play a role in improved management of water resources.

In broad terms, there are four key connections that enable the SEEA and the AWS Standard to be linked. These are through the provision of:

- context
- classifications and boundaries for measurement
- support for impact analysis and evaluation
- accounting and reporting structures.

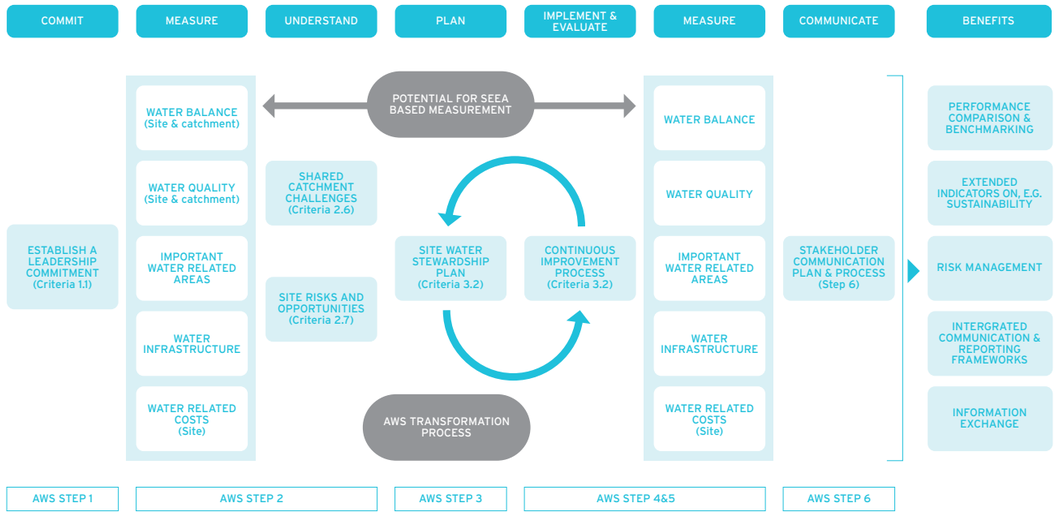
The following sections outline how the accounting model of the SEEA can be used to support the implementation of the six steps of the AWS Standard considering the relevance of each of these key connections. A particular focus in the discussion is the extent to which there is an overlap in the scope of data required for the AWS Standard and the measurement scope of the SEEA framework.

The connections between the AWS Standard and the SEEA can be envisaged at a number of points through the application of the AWS Standard as summarised in Figure 5. The figure highlights the key role of measurement in the application of the AWS six steps in underpinning the transformation process. Following initial leadership commitment, the primary areas of measurement are listed, followed by examples of the links to subsequent steps in the AWS Standard. The principle of continuous improvement is reinforced by signalling the ongoing measurement.

The benefits of forging a connection between the SEEA and the AWS, described in more detail in section 5, include:

- Comparison of performance (benchmarking) among firms, within catchments, across countries, and within and across industries and sectors with respect to water use and water stewardship.
- Extended measures and indicators of water stewardship based on the integrated nature of the SEEA framework, for example, with respect to productivity, sustainability and capacity.
- Improved risk management, for example in relation to resilience to drought and response to the effects of climate change.
- Communication of water stewardship performance in broader sustainability discussions.
- Exchange of information across scales, for example the use of AWS collected data to support compilation of SEEA based accounts and the use of SEEA based data to support improved understanding of the environmental context for any individual entity.

Figure 5: Water stewardship transformation: Connecting the SEEA and the AWS Standard



Step #1: Commit

AWS Standard Step #1 requires leadership commitment and developing a water stewardship policy. Taking this step requires, in the first instance, an awareness and understanding of the importance of water resources in the specific operational context for the firm or site concerned. The SEEA's accounting framework provides a means to place site and firm level use of water resources in a broader context both economically, by describing links to economic and social activity, and environmentally, by describing water resources in the context of other environmental stocks and flows within a relevant spatial area, e.g. a catchment, municipal/urban area, or industrial zone.

Further, through an ecosystem accounting perspective, the SEEA framework can highlight the relative importance of water resources by making the connection to flows of ecosystem services and associated benefits. This can support a discussion of the role of water stewardship beyond direct benefits to a specific entity to the indirect benefits, and costs of inaction, on other entities and the community generally.

The benefit of using the SEEA framework is that since it is being applied in a variety of situations beyond water resources, there is a higher chance of engaging in a commonly understood way beyond the AWS Standard, for example, with regard to biodiversity and land use change.

Step #2: Gather and understand

Comparing AWS and SEEA based data sets

The collection and presentation of data and evidence is a central feature of the AWS Standard. The focal point for this work is as part of Step #2: Gather and understand, but all steps involve data to some degree.

Given its statistical origins, the SEEA is particularly suited to supporting the gathering of data on water resources. As introduced above, the specific guidance of the SEEA Water and the associated International Recommendations on Water Statistics (IRWS) provide internationally agreed data to support measurement of indicators such as:

- water use and consumption
- water balances, in particular linking surface and groundwater stocks and flows
- water condition and quality.

The SEEA's ecosystem accounting perspective provides an important basis for the consistent mapping of catchments and sub-catchments and the delineation of different ecosystem types. This can provide a clear basis for the definition of Important Water Related Areas (IWRA) which are a specific area of focus within the AWS Standard.

Further, while the SEEA is generally perceived as a national level reporting tool, in fact, the accounting concepts and principles are not scale dependent and can be applied at the level of individual catchments and sub-catchments and in relation to individual entities. Thus, while it is likely that the methods applied in practice may vary between implementation at the national level and implementation at entity level, the same concepts and terminologies are applied.

From this initial assessment of the AWS indicators, it appears that the types of indicators incorporated into the AWS Standard are well aligned with the types of indicators that would be selected if the SEEA framework had been applied through the development process. Table 1 below summarises the primary indicator area used in the AWS Standard and indicates the extent of overlap with the SEEA.

Table 1: Connections between AWS indicator areas and scope of the SEEA

INDICATOR AREA	AWS CRITERIA	SEEA CONNECTION
Site and catchment scoping/ delineation	2.1	Water resources asset account, land and ecosystem extent accounts
Water governance	2.3 (Indicator 2.3.1)	Not covered
Water balance	2.3 (Indicator 2.3.3); 2.4 (indicator 2.4.2); 4.2 (Indicator 4.2.2 & 4.2.3); 4.9; 4.14	Water resources asset account and water supply and use account
Water withdrawals	2.3	Water supply and use account
Water quality/status/condition	2.3 (Indicator 2.3.4); 2.4 (indicator 2.4.3); 4.3 (Indicator 4.3.2 & 4.3.3); 4.10	In scope of IRWS but not well developed at aggregate level. Some related information on condition of water resources in ecosystem accounts. Flows of wastewater captured in water supply and use account
Important water-related areas	2.3 (indicator 2.3.5); 2.4 (Indicator 2.4.5); 4.3 (Indicator 4.4.2); 4.11	Ecosystem extent and condition accounts, Ecosystem services accounts
Water infrastructure	2.3 (Indicator 2.3.6)	Incorporated via SEEA links to the standard economic accounts
Water related costs	2.4 (Indicator 2.4.6); 5.1	Incorporated via SEEA links to the standard economic accounts
Indirect water use	2.5, 2.11	Water supply and use accounts (design links to broader descriptions of supply chains) and ecosystem services accounts
Water risks and opportunities	2.7	Not covered directly although SEEA based data may provide a basis for assessment
Status of groundwater	2.12	Water resources asset account and ecosystem accounts
Social impact assessment	2.13	Not covered directly but SEEA based data can be used to underpin broader social impact assessment including valuation of ecosystem services

There is a clear overlap at this higher-level view and, indeed, there seems relatively good alignment in the general definition of items provided in the glossaries of both systems. However, for the purposes of practical data collection and indicator calculation, it is necessary that the precise definition of the data items, as well as associated measurement boundaries and relevant classifications are also aligned. In this regard, it is noted that the text in the AWS Standard is not definitive, referencing a range of different water measurement tools relevant to different aspects of the AWS. This brings with it the risk that different sites and catchments may capture similar but slightly different data to support planning and analysis.

The SEEA on the other hand represents a single, internationally agreed standard and is further underpinned by the International Recommendations for Water Statistics. The use of these statistical standards by firms implementing the AWS Standard would therefore be of direct benefit in:

- ensuring the ability to use data from public data sources where SEEA based data are compiled and to supply data to public data compilers where SEEA is used
- reducing costs of data collection and reporting where multiple streams of reporting are required
- reducing associated costs of training and data infrastructure development that can be more easily shared
- increasing the potential for comparison across sites and catchments and across scales
- improving the alignment of data across different aspects of water resources measurement (e.g. between condition of water resources and the condition of IWRA)
- support consistency of messaging on the status of water resources from site level to catchment and national level.

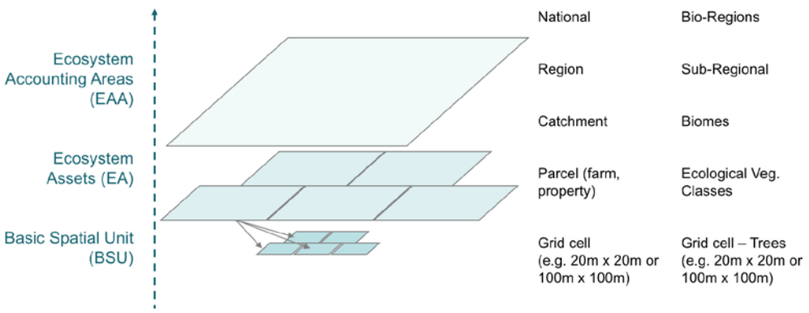
To clarify more precisely the extent of the potential differences, more investigation is required to look at the detail of the indicator definitions and associated measurement boundaries between AWS and SEEA.

Other aspects of data collection and co-ordination

The use of the SEEA framework may also open up an extended range of indicators for use in the AWS Standard. In particular, there may be opportunities to use the integrated stock and flow elements of the SEEA's accounting framework, and the alignment of environmental and economic data to produce indicators that speak more directly to issues of productivity, sustainability and capacity.

In addition, the application of an ecosystem accounting perspective would provide a means to establish the connections to a complete set of beneficiaries from improved water stewardship for a particular catchment and/or entity using the hierarchical spatial accounting framework of the SEEA (see Figure 6 below). The SEEA classifies beneficiaries following the standards used to record economic activity, i.e. in terms of both industry (e.g. agriculture, manufacturing, etc.) and institutional sector (e.g. corporations, government, households).

Figure 6: Understanding linkages between beneficiaries through spatial accounting



Source: IDEEA Group

By using the standard groupings of the SEEA in implementing the AWS Standard, there is clear potential to utilise information already available on the relative importance of these economic groupings and ensure a comprehensive assessment is made – since the classifications of industry and sector can be used as checklists in the assessment exercises.

Further, by using standard industry classifications, the information for a given firm can be readily compared to other firms in the same or different industry classes, or to firms in other catchments or countries.

Another important role that the SEEA can play arises when a firm aims to measure not only water related aspects but also other components of natural capital, e.g. land use and GHG emissions. Often each type of natural capital is measured independently using dissimilar or unaligned data sources and methods. This often results in data and indicators that cannot be compared in a meaningful manner for decision-making within the business. This may result in competing or inefficient (not cost effective) policies and approaches being implemented.

Since the SEEA encompasses all components of natural capital (including biodiversity), it provides a means to utilise multiple data sources in a consistent way and establishes a common, underlying data infrastructure for assessment. This data organization and integration role of the SEEA may be one of its greatest benefits, particularly as entities seek to expand beyond their initial areas of focus and work to embed a range of natural capital measures in their operations – i.e. going beyond water stewardship. From a business perspective, this supports a lower cost approach that is adaptable to business needs over the long term. More broadly, data integration provides the system-wide information that limits the risk of unintended consequences from operational decisions and reflects the principles of Integrated Water Resources Management (IWRM).

Overall, in the step of gathering data and understanding specific context, the SEEA has a significant potential role in supporting the AWS Standard, through both framing and providing data to describe the water related stocks and flows of any specific entity or catchment.

The reverse is also true, to the extent that a given entity or catchment adopts the AWS Standard and uses the SEEA framework to underpin measurement, there is a clear potential for the information collected through the AWS Standard to be further utilised in the generation of SEEA based accounts – particularly water and ecosystem accounts – at higher scales. This is logically the equivalent of utilising corporate financial information to support the measurement of economic activity at the national level.

Step #3: Plan

Building on the information set constructed in Step #2, the stage of planning for high quality water stewardship must take into account all available policy options and the specific context. The support of the SEEA in this step is primarily based around the potential to use the integrated framing of water resources with other environmental stocks and flows and with economic activity, as articulated in Step #2, to support a discussion of different planning options at the firm level. This can drive context-based, target setting rather than more simply applying industry wide benchmarks of, for example, water use.

In this regard, it is noted that the SEEA framework can be used to support the environmental extension of a range of analytical models and approaches such as cost benefit analysis, trade-off and scenario analysis (including input-output, general equilibrium and other economic modelling), return on investment measurement and risk assessments. Since the SEEA has been designed to integrate environmental data with economic and financial data, it is ideally suited to translating environmental information into a language and format that can be readily understood in a standard, financially-based decision-making situation.

Step #4: Implement

The focus of Step #4, implementation, will clearly be on the activities associated with the policy and planning determined in earlier steps, for example restoring water catchments or establishing new governance procedures, with the intention of achieving or moving towards best practice. A connection to the SEEA can be seen in its capacity to compare outcomes across sites and hence play a role in defining best practice and, more specifically, best practice in the context of a particular catchment. Put differently, without a common standard for collection and organisation of data, it is challenging to establish an evidence base for best practice.

Further, while initial focus is likely on site-level practices, ideally these practices should be considered in the context of the broader catchment and socio-economic context. At this broader level, the SEEA is well placed to integrate a range of different data and hence support implementation of the AWS Standard.

With regard to information management specifically, two connections to the SEEA can be identified. First, depending on the length of time of the implementation phase it may be appropriate to monitor progress towards the objectives of the plan for which different indicators may be tracked on a regular basis. Second, it may be that a specific objective within a broader plan is the establishment of monitoring systems and information infrastructure. In both situations, particularly the second, the SEEA can provide relevant support and experience.

Step #5: Evaluate

Evaluation is essential in any process of continuous improvement. At one level, it will be important to focus directly on the specific objectives of the site water stewardship plan (Step #3) and to gather the relevant information to support an assessment of progress. Where evaluation in this step is on site level assessment of water stewardship performance, SEEA can provide support as discussed above. Beyond that, where AWS Standard evaluation relates to the number of (and responses to) water related emergency incidents and extreme events, assessments of response plans and governance and, more broadly consultation with stakeholders, the SEEA is less likely to provide direct support.

Step #6: Communicate and disclose

Maintaining engagement with all stakeholders, going beyond the stakeholder engagement in Step #5, is an important part of the AWS Standard process and communication is central to this. For the communication of estimates, for example to highlight trends with relevant stakeholders, the SEEA supports the consistent derivation of indicators and also provides accounting structures that can be used to demonstrate extended financial reporting of balance sheets and operating statements and also structure non-financial reporting. Depending on the audience and their requirements these accounting structures can be adapted to suit particular requirements.

At a broader level, it will be relevant to track outcomes from the implementation of AWS water stewardship practices and to show how these relate to catchment, state, and national-level water issues, and to communicate the relationship between good water stewardship performance and good economic/environmental/social performance.

It is here that the use of the SEEA can play a very strong role. Since SEEA has been designed to describe outcomes in a comparable way at different scales, it provides the basis to compare outcomes from a particular water stewardship project or entities activities with the broader developments – within the same catchment, in comparison to other catchments, and across countries. Clearly the potential to make such comparisons will require the development of SEEA based accounts across catchments and countries but this is an activity that is well underway. Further, because the SEEA framework is designed to support the integration of environmental data and socio-economic data, it provides a platform for making the connection between water stewardship performance at the firm level and broader measures of progress and sustainability.

The key to success here is the use of a common language and agreed measurement boundaries. Importantly, it is not necessary for exactly the same measurement methods, systems or techniques to be applied at all situations. This will be particularly important to allow for the likely significant differences in environmental context and resource availability. This should also facilitate the use of existing data and tools and encourage innovation in measurement over time.

5. FINDINGS AND RECOMMENDATIONS

BENEFITS OF LINKING SEEA AND THE AWS STANDARD

Overall, there is a clear potential to use the SEEA to provide a data collection and organisation framework for the AWS Standard. This potential exists not only in relation to Step #2 (Gather and understand), but more broadly across the six steps of the AWS Standard. Recognising the potential of a comprehensive information framework, such as the SEEA, to support discussion, research and communication throughout the stewardship process is a key recommendation of this paper.

The use of the SEEA as an internationally agreed framework for data collection and organisation to support implementation of the AWS Standard would support:

- Comparison of performance among firms, within catchments, and across countries. In particular, it would be possible to understand the extent to which individual firms adopting the AWS Standard were contributing to the improved health and condition of their catchment. Implicitly, this could become one indicator of the relative benefit of the AWS water stewardship system itself.
- Comparison within and across industries and sectors with respect to water use and water stewardship. As the SEEA is designed to integrate environmental and economic data and is structured to provide information at industry level (e.g. agriculture, manufacturing, etc.), the information collected through the AWS Standard can be used to establish industry performance benchmarks in a standardised way, and also provide links to economic modelling and forecasting.
- Extended measures and indicators of water stewardship based on the integrated nature of the SEEA framework, for example, defining indicators of productivity, sustainability and capacity with respect to water use and the condition of catchments.
- Distinguishing good/better water stewardship performance and changes in performance over time by utilising the broad data comparability inherent in the use of the SEEA framework. In turn, this information can support access to incentives for good water stewardship, for example in terms of government financial support, interest rate discounts, markets for green bonds and similar finance.
- Further, since the AWS Standard and the SEEA both support holistic assessments of water resources in the context of the surrounding ecosystem and economic context, there is the potential to demonstrate how good water stewardship can contribute to a lowering of systemic risk, for example in relation to resilience to drought and response to the effects of climate change.
- Communication of water stewardship performance in broader sustainability discussions through alignment between the AWS Standard and the SEEA. The SEEA is progressively being adopted as the measurement standard in international and national government sustainability contexts including the UN Sustainable Development Goals.
- Exchange of information across scales, for example the use of AWS collected data to support compilation of SEEA based accounts and the use of SEEA based data to support improved understanding of the environmental context for any individual entity.

RECOMMENDATIONS

This paper provides a description of the potential linkages between two recently developed standards – the AWS Standard on water stewardship and the SEEA statistical standard for the integration of environmental and economic data. It demonstrates many areas in which the implementation of the AWS Standard and the advancement of the SEEA can be mutually supported.

However, this paper only gives a taste of the potential and it is recommended that further work be undertaken to demonstrate the potential in practice. Given the number of current AWS and SEEA based programs currently underway, it would be ideal to seek opportunities to develop case studies to examine the links as part of existing work.

Case studies could be developed in the following three areas:

- For individual firms / sites within a single catchment, the SEEA framework could be tested to examine its potential to structure information on the context for water stewardship, including integrating information on water resources and ecosystems with company level financial information. Such a study could also test the development of relevant indicators and the potential to use SEEA defined indicators to support firm level decision making.
- For a single catchment or municipality (e.g. a city/urban centre), a case study could investigate questions of water stewardship by following the AWS Standard, looking in particular at the relationship between individual firm activity and overall catchment or municipal outcomes. This may be of particular interest in areas with known issues of water stress or scarcity where there may be a disconnect between information compiled at different scales.
- For a single industry or sector, e.g. the dairy industry, the textile manufacturing sector, a case study could examine the integration of firm level and industry level information on water use while also making the connection to varying environmental and spatial contexts that face different firms within the same industry.

From each of these types of case studies it would be expected that clear messages on the types of information infrastructure that are required can be made and that guidance can be provided on the definition and derivation of indicators that are of most relevance at firm, industry, catchment and national levels.

Either in conjunction with these types of cases studies or separately, it is recommended that investigation take place concerning the alignment between the current AWS indicators and the related SEEA concepts and definitions and concerning the potential to use the SEEA framework to articulate extended indicators about productivity, sustainability and capacity.

Finally, it is recommended that discussion and investigation consider the potential for the SEEA framework to provide a standardised and robust information infrastructure to underpin the development of incentives for good water stewardship. The SEEA's accounting framework can provide a strong basis for this task since its organisation of information mirrors the way in which financial data are collated for investment decisions.

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