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# Strengthening Water Stewardship in Agricultural Sustainability Standards

Framing collaborative solutions to mitigate water risks

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## List of Abbreviations

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4C	4 (Common Code for the Coffee Community) Coffee Association
AWS	Alliance for Water Stewardship
BCI	Better Cotton Initiative
CAT	Certification Assessment Tool
CoC	Chain of Custody
COD	Chemical Oxygen Demand
CmiA	Cotton made in Africa
FAO	United Nations Food and Agriculture Organisation
ESIA:	Environment and Social Impact Assessment
FPIC:	Free Prior and Informed Consent
GLOBALG.A.P.	Global Good Agricultural Practice
GRSB	Global Roundtable for Sustainable Beef
HCV	High Conservation Value
HCVRN	High Conservation Value Resource Network
IFOAM	International Federation of Organic Agriculture Movements
ISEAL	International Social and Environmental Accreditation and Labelling (Alliance)
ISO	International Organisation for Standardization
ITC	International Trade Centre
IWRM	Integrated Water Resources Management
LCA	Life Cycle Analysis
RSPO	Roundtable on Sustainable Palm Oil
RTRS	Roundtable on Sustainable Soy Association
RSB	Roundtable on Sustainable Biomaterials
SAI	Sustainable Agriculture Initiative
SAN	Sustainable Agriculture Network
SRP	Sustainable Rice Platform
SSI	State of Sustainability Initiatives
T4SD	Trade for Sustainable Development
WASH	Access to safe drinking water, adequate sanitation, and hygiene awareness
WBCSD	World Business Council on Sustainable Development
WF	Water Footprint
WFN	Water Footprint Network
WWF	World Wide Fund for Nature
UN	United Nations

## Message from the Chief Conservation Officer of WWF Germany

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A drought in California causes an estimated annual loss of 2,2 billion US\$. In a Turkish river basin the pollution from upstream agricultural production causes economic losses downstream. And in many developing countries public authorities still fail to manage the water resources in a beneficial way for people and nature. These are some examples of the water challenges we face globally today that have

tremendous effects on people, nature and economies. A root cause of many of those problems is bad governance of river basins. The challenges and solutions are complex - and in order to sufficiently address the global water crisis we have to address the causes in multiple ways. Improving the approach of certification systems towards more sustainable water criteria can be one of those solutions.

At WWF we are engaged in a wide range of voluntary minimum standards (such as RTRS, RSPO, or BCI). We believe that the goal of standard systems is to contribute one piece to the sustainable development of our planet. Given the importance of certification in relation to international trade and production, the contribution that can be achieved should not be underestimated. When looking at freshwater as one major resource of production, standard systems today often focus on the efficient use of the resource. However, experience shows that efficiency (e.g. technology) does not necessarily reduce the risks companies are facing. Despite the best available technology, the production can be affected by droughts, floods and pollution because of the existing challenges in the river basin. On the other hand, once understanding these challenges, companies can find ways to reduce their risks by contributing to the sustainable development in a river basin. In that context, certification systems have the opportunity of helping companies to understand their risks and to identify potential ways for mitigation.

Realizing the potential contribution of standards for more sustainable freshwater management, we also have to clarify the limitations. We have to acknowledge that certification systems are definitely not the only solution to the puzzle. Since the root cause of the challenges we face is often linked to insufficient governance, positive developments will have to be led by well performing public institutions. Following that thought, we have to be clear that certification systems are not responsible for government performance. However, finding new ways to provide the private sector with the tools to lower their risks and thereby contributing to good governance can be the way.

By developing a water stewardship perspective, certification systems have the chance to better address the water risks of their customers at a broader level. Finding the right balance between on-site and river basin-linked water criteria will be a challenge for many thinkers and practitioners – but also a further stepping stone towards a more sustainable approach on freshwater for people and nature. We hope that the evaluations and recommendations presented in this report can be a constructive contribution on this new approach.

A handwritten signature in black ink, appearing to read 'C. Heinrich', written in a cursive style.

Christoph Heinrich  
Chief Conservation Officer  
WWF Germany

## Message from the Head of Corporate Communications of EDEKA



Responsible trading has already been firmly associated with the name EDEKA for many decades and is an integral component of the EDEKA co-operative society. The WWF has been a strategic partner for increased sustainability and an independent advisor since 2009. Collaboration to protect the oceans and for sustainable fishing developed into a broader strategic co-operation. This extended partnership

focuses on finding sustainable solutions in the areas of fish and seafood, wood/paper/tissue, palm oil, soya, the climate, packaging types and of course: freshwater. Because those seeking to be successful in the long-term must utilise this precious resource responsibly.

It is the common objective of the partnership to significantly reduce the ecological footprint of EDEKA and to evoke the enthusiasm of more and more customers for sustainable products, as well as sustainable consumption. Consequently, the expansion of the range of products manufactured in a more environmentally sustainable manner and the clear labelling of more sustainable alternatives is an essential factor of our collaboration.

Given this background, the responsible use of water in agricultural production is a central topic: freshwater is becoming increasingly scarce in many areas of the world, represents an important resource to trade, and mismanagement can have radical consequences for the environment and society. Therefore, identifying and reducing water risks for selected products and product groups of EDEKA's own brand range is a focus for our work. In this respect, not only the level of production but also the regional water situation is decisive. That is because the cause of water problems often goes beyond the field level. In order to work on solutions, EDEKA is carrying out pilot projects with the WWF in countries with a dire water situations.

Due to the number of products involved, the worldwide countries of origin and the extensive value-chains, sustainability standards represent a major opportunity for a sustainable improvement of food supply-chains. Starting with our own brands, EDEKA is continuing to work towards integrating a better approach towards water into corporate activities like making the situation as transparent as possible and in order to reduce water risks in a responsible manner.

Therefore, EDEKA is pleased to support the WWF for this study. After all, improving the water criteria for certifications and assessment systems on the basis of more holistic understanding of the resource can do more justice to regional water situations and lead to more sustainable water management in agriculture. This study delivers a valuable contribution towards finding the right approach for improvement. Fresh water is a valuable asset – and it must be protected from an economic, ecological and social perspective.



Rolf Lange,  
Head of Corporate Communications EDEKA AG

## Executive Summary

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Water underpins all economic activity and represents one of the greatest risks to the global economy if not properly managed. Freshwater, often sourced from ecosystems in peril, plays a particularly important role for agricultural commodity production, which accounts for over 70 per cent of global freshwater use.

In recent years, economic leaders have begun to recognise the significant risks posed by water scarcity and water quality declines. A growing awareness of the potential impacts of water on the global economy has been mirrored by a growing recognition that water users must go beyond site level management to catchment-inclusive water stewardship to mitigate risks.

At the same time, agricultural sustainability standards have experienced significant growth and have come to represent a key mechanism through which large multinational firms address their sustainability goals. The combination of these trends suggests it is worthwhile considering the extent to which these agricultural sustainability standards help drive water stewardship and address freshwater challenges.

The goal of this study is to assess and better understand how agricultural commodity standards currently address the challenges of freshwater conservation through water stewardship practices, and to provide constructive solutions to strengthen water stewardship approaches. Simply put, the study seeks to provide a roadmap for agricultural sustainability standards to more comprehensively address the water risks of their users.

More specifically, the study has three objectives:

- » **To develop an integrated water and standards assessment framework** that could align and enhance the coverage of water stewardship in existing standard and certification evaluation.
- » **Identify, understand and provide insights on cross-standards patterns of coverage and gaps** regarding the way standards account for water stewardship issues; and specifically to answer the following:
  - Can **water-specific guidance documents** tailored to the given standard be employed to effectively address water stewardship gaps?
  - Can **water-specific standards** be employed in collaboration with existing standards to effectively address water stewardship gaps?
  - Can **supplemental organic-related standards** that go “over and above organic requirements” help to effectively address water stewardship gaps?
- » **Highlight solution pathways for the standards community** when it comes to how standards can better address water risk and incorporate water stewardship in a manner that works for their systems.

The study was **not intended to rank standards** or determine “which is best”. Each standard is purpose-designed for specific and contextual issues and this study does not account for these nuances. WWF employs its Certification Assessment Tool for full evaluations of standards, which accounts for a broader array of considerations and compares standards within a given sector. Furthermore, this study is **not intended to evaluate water-related performance** (i.e., impacts); rather it is assessing the written requirements in the system. Ultimately all of the standards in this report provide positive contributions to water challenges

Ultimately all of the standards in this report provide positive contributions to water challenges over and above conventional agriculture and each plays a key role in their own respective manner.

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over and above conventional agriculture and each plays a key role in their own respective manner. Simply put, the study offers an opportunity to learn from one another and support even stronger approaches, and in no way should be construed as suggesting that existing efforts are weak or inadequate. Indeed many continue to demonstrate a strong track record of impact on the ground with regards to water.

The assessment was based on 27 metrics spread across four water stewardship outcomes: water governance, water balance, water quality and water-related areas of high importance (important water-related areas). These broad water stewardship outcomes and the different metrics were drawn largely from linking WWF's approach to water stewardship, the Alliance for Water Stewardship standard, and WWF's Certification Assessment Tool (CAT). The resulting integrated water stewardship and standards framework, a key result of this study, enhances WWF's ongoing efforts to provide consistency in standards evaluation and align with other global platforms, such as the International Trade Centre's (ITC) Trade for Sustainable Development (T4SD) Standards Map.

Standard systems were selected on the basis of a combination of their prevalence of use<sup>1</sup>, their importance to freshwater consumption, as measured by global blue water footprints<sup>2</sup>, and their strategic importance to WWF.<sup>3</sup> "Standards" were somewhat loosely interpreted and include both standards with formal accompanying certification systems as well as voluntary systems. The result is a focus on 17 standards: five with a broader agricultural focus, 12 with a commodity-specific focus.

The 17 standard systems were: 4C Association (4C), Aquaculture Stewardship Council – Tilapia (ASC), Better Cotton Initiative (BCI), Bonsucro, Cotton made in Africa (CmiA), Fairtrade, GLOBALG.A.P., Global Roundtable for Sustainable Beef (GRSB), International Federation of Organic Agriculture Movements – Norms for Organic Production and Processing (IFOAM), ProTerra, Roundtable on Sustainable Biomaterials (RSB), Roundtable on Sustainable Palm Oil (RSPO), Roundtable on Responsible Soy (RTRS), Sustainable Agriculture Initiative Platform (SAI) – Crops & Vegetables/Water Management/Water Stewardship, Sustainable Agriculture Network (SAN), Sustainable Rice Platform (SRP), and UTZ Certified – Coffee (UTZ).

In addition to these 17 standards, several other standards were assessed.

First, two water-specific supplementary guidance documents (both from the SAI Platform) were explored to evaluate the extent to which such supplementary guidance can address water stewardship gaps.

Second, two water-specific standards – Alliance for Water Stewardship's (AWS) Water Stewardship Standard and the International Organisation for Standardization (ISO) Environmental Management Water Footprinting Standard (ISO 14046) – were also assessed to help understand how these can address gaps in commodity standards.

Third, a deep-dive on regional supplementary standards, which go over and above organic requirements, was undertaken to better understand the nuances between requirements within one area. In addition to IFOAM Norms, this included the evaluation of two other organic-related standards: Bioland and Naturland.

In total, 24 standard systems were assessed using the framework and the table

Reasonably well covered (Average score: 3.0 – 1.5)	Poorly covered (Average score: 1.4 – 1.0)	Very poorly covered (Average score: 0.9 – 0.0)
<b>Water governance</b>		
Water management as a priority (2.4)	Transparency and stakeholder engagement (1.3)	Catchment collaboration/ collective action (0.9)
Legal compliance (2.1)	Dispute resolution (1.2)	Indirect water use assessment (0.8)
Water, sanitation and hygiene (2.1)	Water risk assessment (1.3)	Future scenario and resilience planning (0.7)
Water management plan (1.8)	Environmental & social impact assessment (1.2)	Participation in catchment governance (0.4)
Catchment context (1.6)		Formal leadership commitment (0.3)
Land and water rights (1.6)		
<b>Water balance</b>		
Water use efficiency (2.2)	Absolute quantitative water use limitations (1.3)	
Quantitative water use information (1.6)		
<b>Water quality</b>		
Water effluent management (2.5)		
Qualitative water use information (1.8)		
Absolute water quality limitations (1.6)		
<b>Important water-related areas</b>		
Management of water-related habitat areas (2.3)	Management of water-related socio-cultural areas (1.3)	Aquatic invasive species (0.9)
Water-related land cover conversion & restoration (2.2)	Ecosystem services (1.1)	
Rare, Threatened & Endangered freshwater species (1.6)		

Degree of coverage of water stewardship issues in assessed agricultural standards

below outlines the average levels of coverage of the water stewardship issues across the framework issues with a score of three indicating strong coverage, two indicating some coverage, one indicating very limited coverage (or some reference) and a score of zero indicating no coverage or reference by the standard under assessment.

This study concludes that all of the assessed agricultural sustainability standards address an array of water management issues (e.g., on-site water effluent measures, water efficiency and riparian buffers), but currently have some key gaps when it comes to water stewardship (e.g., collective action), most notably around water governance issues. While recognising the good practices around encouraging water efficiency and minimising water pollution, and acknowledging the risk variation amongst commodities, there is still, in general, the need to encourage growers to address their catchment-related water risks. Water stewardship, helps to mitigate water risks by considering the present and future catchment context, and engaging in collective action and catchment governance. All of these elements of water stewardship remain areas that would be well served through greater attention from the standards included in this study. Conclusions drawn from this assessment:

» **Water quality had the most robust coverage while water governance was the area with the greatest number of gaps** across the standards.

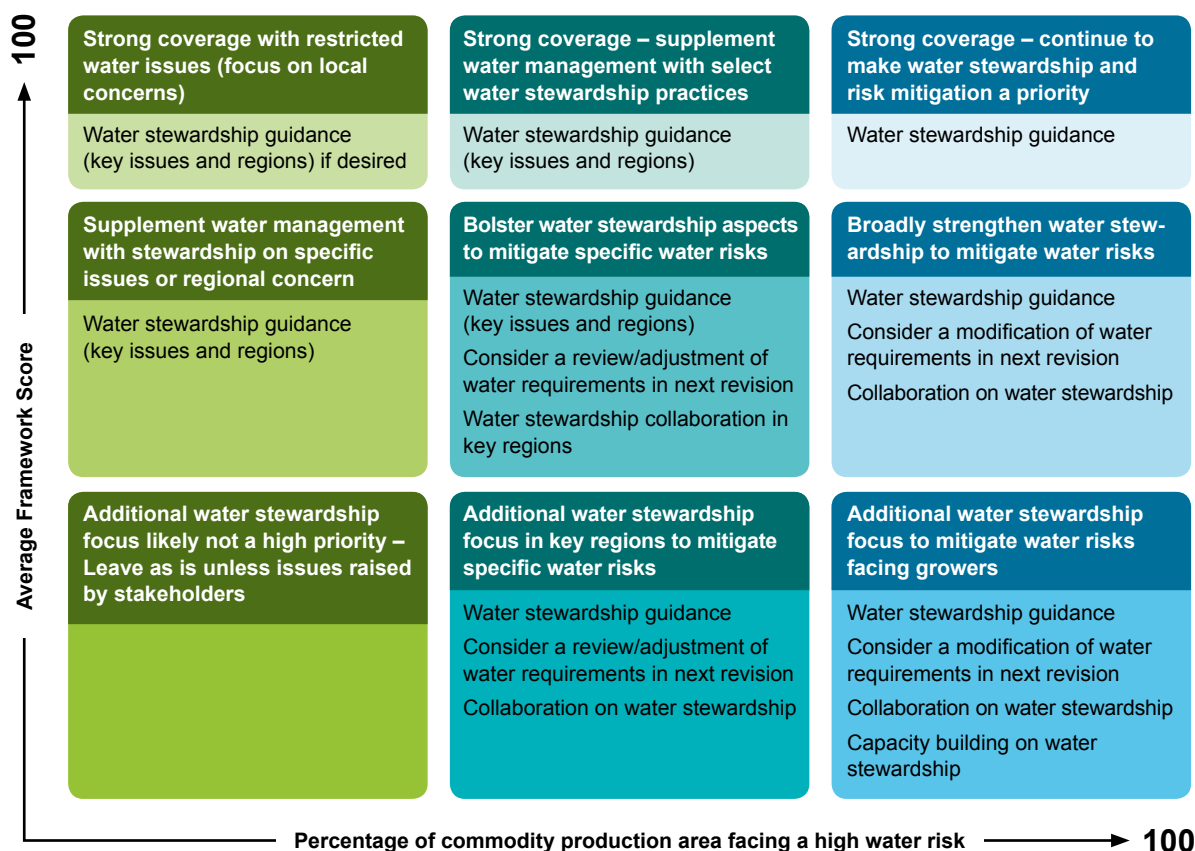
Water stewardship guidance for standards may be tailored to the regions and commodities where specific water issues matter most to growers.

- » **The best covered issues were:** effluent management; management of ecologically important areas; provision of safe drinking water, adequate sanitation and hygiene awareness (WASH); water use efficiency; land cover conversion; and legal compliance.
- » Conversely, the **areas that would most benefit from greater coverage** include: indirect water use, anticipated future scenarios/resilience planning, water risk assessments, management of (aquatic) invasive species, collective action, engagement in catchment governance, and leadership commitments.
- » There continues to be **an over-reliance on site-level water management practices** (pollution prevention and water use efficiency) with a lack of requirements to **mitigate water risk through collaborative water stewardship practices**, such as positive engagement in collective action and basin governance.
- » While WASH issues are relatively well covered, there are still **opportunities to have WASH universally and comprehensively covered by all standards** given the human right to water and sanitation.

In terms of how supplementary approaches can cover gaps, the study found:

- » There are some excellent freshwater conservation and water stewardship practices to be found throughout various standards that can help to inform one another. These **opportunities to share practices and learn from one another should be encouraged** by coordinating bodies like the International Social and Environmental Accreditation and Labelling (ISEAL) Alliance and the International Federation of Organic Agriculture Movements (IFOAM).
- » **Water-specific guidance has significant promise to enhance water stewardship efforts.** First, such guidance has the advantage of not requiring a formal change to the standard. Second, it may be tailored to the regions and commodities where specific water issues matter to growers. Third, it may draw from established, practical, field-tested guidance and tools already developed. Such guidance can be included a) in any official guidance that accompanies the standard, b) in a separate, supplementary guidance document on water, or c) informally via other mechanisms, such as training.
- » **For areas facing high water risks, and for users seeking assurance of water risk mitigation efforts, standard system collaboration is a strong, viable solution.** For example, where standard systems or their users wish to strengthen water governance practices, AWS may help to address the gaps. Similarly, where understanding the water use associated with feed is of concern, use of water footprinting may address the gap. With aligned and efficient auditing, dual certification may also be a solution. In all cases, standards need to think of joint solutions, including opportunities to jointly build awareness and capacity to tackle water challenges beyond the site level.
- » **No significant increase in water stewardship coverage was found at present through the supplementary standards assessed in this study.** While this is not to preclude such a solution (which may be particularly useful for national interpretations for regions in countries facing high water risks, such as China, Mexico, India, Pakistan, or South Africa), the two supplementary standards assessed here did improve coverage, but not to as large a degree as either guidance or water-specific standards.

» **Tailoring solutions to commodity and catchment-specific contexts is critical.** A water-risk based framework to help guide standards is illustrated below. This framework forms the basis for a standards to pursue a detailed analysis that explores the water risks facing their applicable commodities relative to their existing stewardship requirements (most notably related to water governance). Such an analysis would serve all of the standard systems well in helping to ensure their users are buffered from the impacts of water risks.



General categorisation to guide water stewardship solution pathways

This categorisation, combined with the analysis provided the basis for customised recommendations for the standard systems involved in this study.

The study also generated four broad recommendations for the standards community:

- » **Recommendation 1:** Further enhance the integrated water stewardship assessment framework and develop common guidance on water stewardship
- » **Recommendation 2:** Encourage standards interoperability with respect to freshwater.
- » **Recommendation 3:** Explore opportunities for mutual recognition and collaboration among commodity standards.
- » **Recommendation 4:** Steadily continue to strengthen water stewardship-related requirements in standards to help mitigate water risks.

**Agricultural standards must begin to move beyond the concept of water efficiency and pollution prevention to water stewardship.**

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We stress that agricultural standards must begin to move beyond the concept of water efficiency and pollution prevention to water stewardship, which involves catchment-based approaches. Mitigating water risks is ultimately a function of both on-site actions and shared actions on water governance within the basin.

Combined, the above four recommendations will help enable scaled catchment solutions that strengthen water governance, address shared water challenges and mitigate water risks for growers and supply chains. Given the peer-learning and partnership opportunities available, and considering the economic and societal importance of water and its related freshwater ecosystems, WWF strongly encourages standard holders to further strengthen their systems' water stewardship elements through any of the above means.

Ultimately, water is a common issue for all standards and one that requires collective approaches and solutions. Addressing shared water challenges in local contexts through improved water stewardship will not be solved overnight, nor in isolation, but through stronger partnerships. This study outlines various pathways to improve water security for people, businesses and nature.

Vietnam is the world's third largest rice producer. In the Mekong delta, production is threatened by seasonal floods, droughts and salt-water intrusion.



WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by:

- » Conserving the world's biological diversity
- » Ensuring that the use of renewable natural resources is sustainable
- » Promoting the reduction of pollution and wasteful consumption.<sup>4</sup>

The conservation and management of freshwater, freshwater habitats – rivers, lakes and wetlands – and freshwater species is fundamental to the achievement of this mission.

Water is necessary for life, and freshwater ecosystems play a key role in maintaining species, including humans. Biologically, economically, and socio-culturally freshwater ecosystems and the services they provide underpin humans and nature. Freshwater ecosystems have a higher concentration of species relative to their area than either land or sea.<sup>5</sup> One need not look far to see how fundamental clean, abundant water is to maintaining human well-being: for drinking, sanitation, agriculture, transport, electricity generation, recreation and many religious cere-

### Water Footprinting Explained



#### Green water footprint

The volume of rain-water stored in soil that evaporates through crop growth.



#### Blue water footprint

The volume of freshwater taken from surface (lakes, rivers, reservoirs) and ground water aquifers that is used and not returned to the system it was withdrawn from.



#### Grey water footprint

The volume of water polluted as a result of production processes (industrial and agricultural) and from waste water from household water use. It is the volume of water required to dilute pollutants to the extent that the water quality reaches acceptable levels.

Products may be viewed as containing the quantity of water used in their production – this is referred to as a “water footprint”. Water footprint are made up of three types of water use, and are known as blue, green and grey water footprints. The green water footprint is the volume of rainwater stored in soil that evaporates through crop growth. The blue water footprint is the volume of freshwater taken from surface (lakes, rivers, reservoirs) and ground water (aquifers) that is used and not returned to the system it was withdrawn from. The grey water footprint is the volume of water polluted as a result of production processes (industrial and agricultural) and from waste water from household water use. It is the volume of water required to dilute pollutants to such an extent that the water quality reaches acceptable levels.

Source: *Living Planet Report, 2014*

monies. Almost every human activity impacts on freshwater: Through the direct use of 'blue water' (water that flows through rivers, lakes, and groundwater) for irrigation, industry or domestic use; through the use of rain water for agriculture before it reaches our lakes, rivers and wetlands; through changes to freshwater's biological, chemical and physical quality resulting from human activity; and through the fragmentation of habitats resulting from damming and canalisation for flood control, irrigation, transportation or energy.

Whilst the direct impacts of water use are local or regional, the drivers are often global as products and services are traded internationally. People already use 54 % of the planet's blue water. Estimates suggest that this may increase to 70 % by 2025.<sup>6</sup> Approximately 2.3 billion people currently live in river basins which are under water stress, where less than 1,700 cubic metres of water is available for each person per year. If current consumption patterns continue, at least 3.5 billion people will live in water-stressed basins in 2025 – half the world's projected population.<sup>7</sup> Climate change is expected to complicate the picture and lead to new stresses, with increases in the frequency and severity of both droughts and floods.<sup>8</sup>

Agricultural  
production  
accounts for 92 %  
of humanity's  
global water  
footprint.

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As human population and consumption increases, freshwater habitats are put under growing pressure, threatened by land-use change, water abstraction, pollution and fragmentation. Notably, agricultural production accounts for 92 % of humanity's global water footprint, with 78 % of world crop production relying on rainfall. In developing countries, an estimated 90 % of wastewater is discharged directly into rivers and streams without treatment.<sup>5</sup> WWF's Freshwater Living Planet Index (which tracks changes in populations of 714 species of fish, birds, mammals, reptiles and amphibians found in temperate and tropical lakes, rivers and wetlands) showed populations of freshwater species fell by 37 % between 1970 and 2010 - a larger decline than in marine and land ecosystems. In tropical regions the decline was 76 % – the largest fall of any of the biome-based indices.<sup>10</sup>

These various trends have resulted in water becoming a topic of significant concern not just to those interested in the environment, but also to business leaders and government leaders. The 2015 edition of the World Economic Forum's Global Risks report<sup>11</sup> rated water as the number one risk in terms of potential impact on society. The emergent United Nations Sustainable Development Goals<sup>12</sup> have also identified water, and its impacts on humans, as one of the key areas of focus. Water's critical role in economic growth and development – be it related to primary resource production (e.g., food systems), energy security, or manufacturing – is increasingly being acknowledged by all levels of society.

In summary, the importance of rivers, lakes and wetlands as priority habitats for conservation, and freshwater's fundamental importance to human life and well-being, make water a critical and timely topic to address.

## 1.2 Freshwater and Agricultural Sustainability Standards

Given the importance of food to people, combined with agriculture's impacts on land and water use, a critical element of WWF's strategy is to transform the way natural resources are produced and consumed. To this end, WWF focuses on 8 priority commodities<sup>13</sup> whose production has the greatest impacts on biodiversity, water and climate. WWF aims to improve the way these commodities are produced worldwide, focussing on the 300–500 companies that control 70 % of global market choice in their production, trade and consumption.

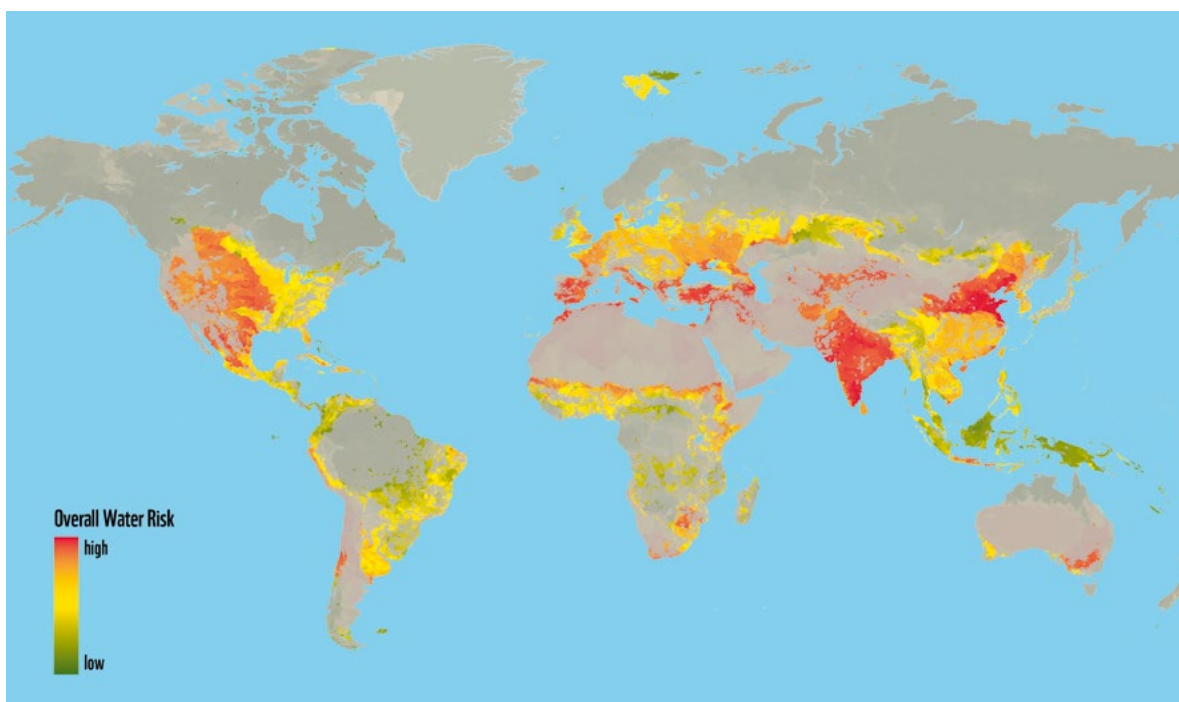
Indeed, over the past 20 years, WWF has engaged extensively in the development and promotion of commodity-based sustainability standards in its efforts to improve commodity production practices.<sup>14</sup> Commodity standards define criteria for good social and environmental practices for an industry or product. These standards can then be used by producers, companies and governments, financial institutions and consumers to guide, identify and encourage responsible practices that will drive long-term sustainability.

There are now hundreds of sustainability standards in use worldwide.<sup>15</sup> Throughout these standards there is considerable variability in approach; some focus on specific commodities (e.g., soy) or sectors (e.g., agriculture), others on specific issues (e.g., water), or geographies (e.g., the European Union). Commodity certification has seen variable levels of uptake with some crops (e.g., coffee) having achieved a substantial level of market penetration and private sector take-up, while others remain in specific niches. These standards have also undertaken different strategies for improving performance, with some focusing on improving performance from very low levels, and others recognising only the highest levels. As the number and variety of sustainability standards has increased, it has become increasingly challenging to determine which standards are likely to be the most effective in contributing to sustainable development, especially on specific issues such as water.

### 1.3 Contextualisation Water Challenges for Agricultural Commodities

Figure 1:  
Map of global water risk  
in agricultural areas from  
WWF's Water Risk Filter

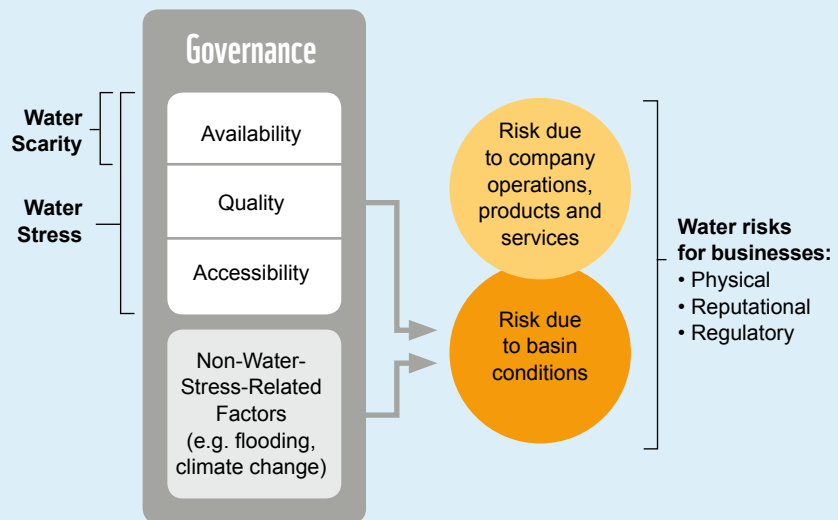
Water is a dynamic global resource that is always experienced locally in time and space. Not all agricultural commodities face water challenges, and even for those commodities that do face water challenges of one kind or another, it varies through time and space (Figure 1).



While perhaps obvious, this premise is critical to the nature of this report and to how water has been tackled by standard systems to date. To a certain extent, if commodities face fewer water challenges (for example, physical water scarcity), they may be well served by having fewer water efficiency requirements, as it makes sense for standard systems to focus (and allocate scarce resources to) the areas that are of greatest concern.

## Water Scarcity vs. Water Stress

In recent years, there has been some discrepancy in the use of certain terms, most notably water scarcity and water stress. In September 2014, a discussion paper developed by a group of NGOs and published by the CEO Water Mandate put forth a series of commonly agreed-upon definitions and a framework illustrating the linkages between commonly employed terms in the water stewardship landscape.



Source: CEO Water Mandate (2014) *Driving Harmonization of Water-related Terminology, Discussion Paper, September 2014*

Water matters a lot to some growers in some places and not as much to other growers in other places – the dynamics in location, climate, socio-economics, etc. are critical.

However, as the following maps and data tables (sourced from WWF’s Water Risk Filter, Figure 2 and 3) illustrate, virtually all commodities demonstrate considerable geographical diversity of water scarcity within their growing regions. Put simply, water matters a lot to some growers in some places (or at some times) and not as much to other growers in other places (at other times). This dynamic element of water is critical to account for in how water is handled by growers, and in turn, by standard systems that guide commodity production.

Water scarcity is one example of a physical water challenge that can result in agricultural producers and buyers facing water risk. Typically water risk is characterised as being physical, regulatory or reputational in nature. Physical water risk includes situations in which growers face scarcity concerns, flooding, water quality issues, etc.; reputational water risk would include situations in which other stakeholders leverage pressure on growers through protests, campaigns, etc.; regulatory water risk involves circumstances in which regulations are further tightened or are variable, making for a more challenging business environment. All forms of water risk can manifest themselves for any given grower, but are more acutely felt in different basins and for different crops depending on the basin context.

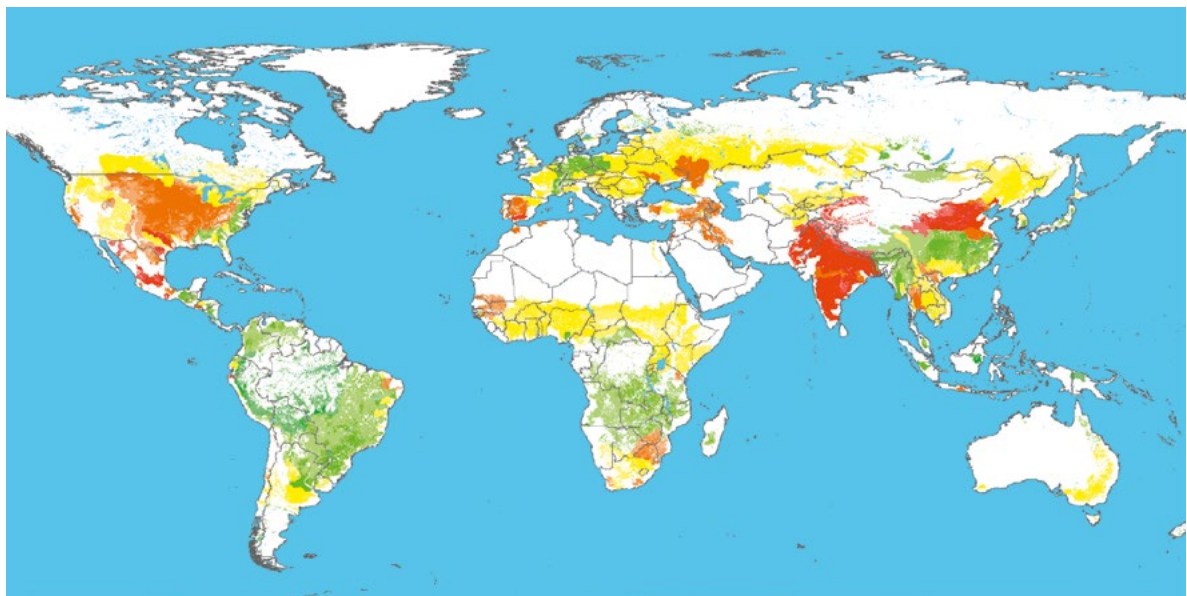
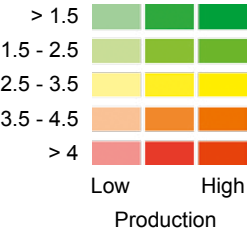


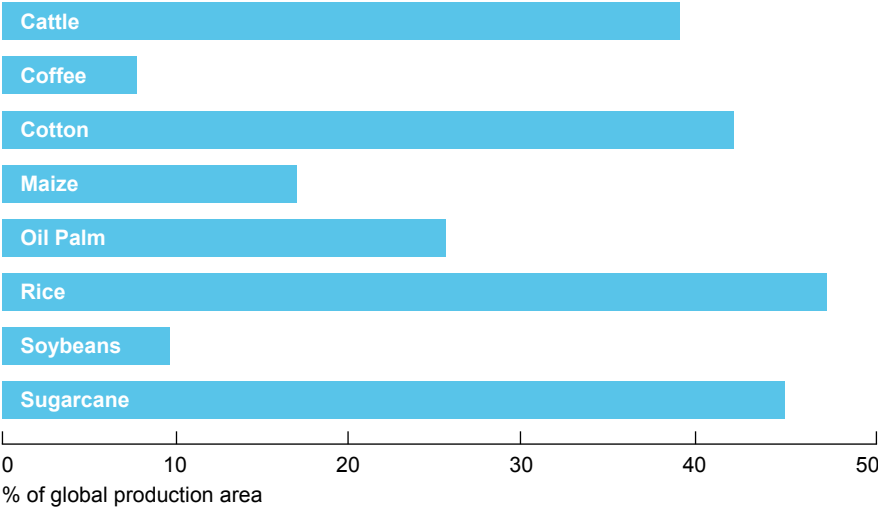
Figure 2:  
Physical water risk  
distributed across  
agricultural land



Furthermore, water scarcity is only one factor that affects physical water risk, and physical water risk is only one type of risk facing growers (the others being reputational water risk and regulatory water risk). While water risk is nothing new to farmers – they have long recognised the challenges associated with floods and droughts – the collective challenges, especially as extreme weather events continue to grow in frequency and intensity – mean that farmers need to be more acutely aware of all forms of water risk. Similarly, retailers need to carefully manage their indirect water footprints and water risk exposure in their supply chains.

To summarise, the water challenges facing growers and buyers vary through space and time, and are heavily affected by the water needs of a given commodity. These challenges, which are often shared, have the potential to manifest themselves as water risks that sites are well served to mitigate. Water stewardship is an approach to not only accounting for such water risks, but to mitigating risks through internal and collective action in order to address drivers that are ultimately solved via catchment governance efforts.

Figure 3:  
Percentage of global  
agricultural production area  
under high water risk by  
commodity



## 1.4 Study Focus and Objectives

In approaching this study, it was important to begin by recognising that standards address water differently for a variety of reasons:

- » Some standards may have intentionally restricted the scope of their coverage on water issues (due to time, cost of additional auditing, burden on users, materiality of water issues for their commodity, etc.);
- » Some standards focus on crops or regions where, for example, water scarcity is less of an issue and/or irrigation is not commonly used and therefore it is expected that these standards will have lower water requirements related to water scarcity/irrigation.
- » Many standard systems evolve through a multi-stakeholder process which may opt to place emphasis in different areas;
- » Some standards have published supplementary guidance on water issues for their users

Reflecting these factors, this study does not begin with the premise that water stewardship should be universally addressed across all standards or that all standards should be adding more water requirements. Rather, **this study seeks to understand how material water issues are, or are not, covered through existing standards' requirements and, based on this information, provide options to standard systems to mitigate water risks.**

The study provides a roadmap to how water can be more comprehensively addressed by agricultural commodity standards.

This study aims to review and better understand how sustainability standards address the challenges of freshwater conservation and water stewardship, to identify general patterns of coverage, and to provide constructive solutions to strengthen water stewardship requirements via learning, collaboration and improvement. In summary, the study provides a roadmap to how water can be more comprehensively addressed by agricultural commodity standards given their high levels of global water consumption.<sup>16</sup>

Specifically, the study's primary objectives were:

- » **To develop an integrated water and standards assessment framework** that could align and enhance the coverage of water stewardship in existing efforts in standards and certification evaluation;
- » **To identify, understand and provide insights on cross-standards patterns of coverage and gaps** regarding the way standards account for water stewardship issues; and specifically to answer the following:
  - Can **water-specific guidance documents** tailored to the given standard be employed to effectively address water stewardship gaps?
  - Can **water-specific standards** be employed in collaboration with existing standards to effectively address water stewardship gaps?
  - Can **supplemental organic-related standards** that go “over and above organic requirements” help to effectively address water stewardship gaps?
- » **To highlight solution pathways for the standards community** when it comes to how standards can better address water risk and incorporate water stewardship in a manner that works for their systems.

For commodities and regions facing higher water risk, a lack of water stewardship coverage may result in greater losses.

Perhaps equally as important is to note what this study is not attempting to accomplish. The study is explicitly not trying to rate which are the “best” standards when it comes to water. Every standard has a niche and role to play with many leaving elements out of scope intentionally due to a variety of reasons. A lack of coverage on water issues in a standard is not “bad” and does not imply that such standards cannot still play an important role in conserving water resources and contributing to sustainability. Furthermore, where a commodity (or a given growing region) is at lower water risk, stronger water criteria are likely not a priority and this study backs such distinctions. However, for commodities and regions facing higher water risk, a lack of water stewardship coverage may result in greater losses from water risks (for farmers and their buyers). Therefore the intention is to help standards mitigate water risks, where exposure is an issue, and in no way should this report be taken as suggesting that the standards herein are not contributing to water impacts, nor suggesting strengthening water requirements is necessary in all cases. A lack of water stewardship requirements may also, depending on the claims of a given standard system and the crop/regional water risks, be misleading if buyers interested in ensuring commodities are “sustainable” believe that a standard is doing what it needs to do to address its long term freshwater availability.

Furthermore, it is also not trying to provide an evaluation of the water-related performance of standard systems as measured by improvements in water consumption, water quality, etc. Rather it looks at the requirements (as stated in their principles and criteria).

Simply put, the aim of this study is to provide constructive pathways for standard systems to address the water risks facing their users in an increasingly water-challenged planet.

Water security for people, nature and agriculture are intertwined. By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity.



## 2 Methodology & Integrated Framework Development

### 2.1 Selection of Standards for Inclusion in Study

As previously noted, agricultural production accounts more than 90 % of humanity's global water footprint.<sup>9</sup> According to FAO<sup>17</sup>, the world's largest crop production volumes are: sugar cane, maize, rice, wheat, milk, potatoes, fresh vegetables, cassava, soybeans, and sugar beets (Figure 4).

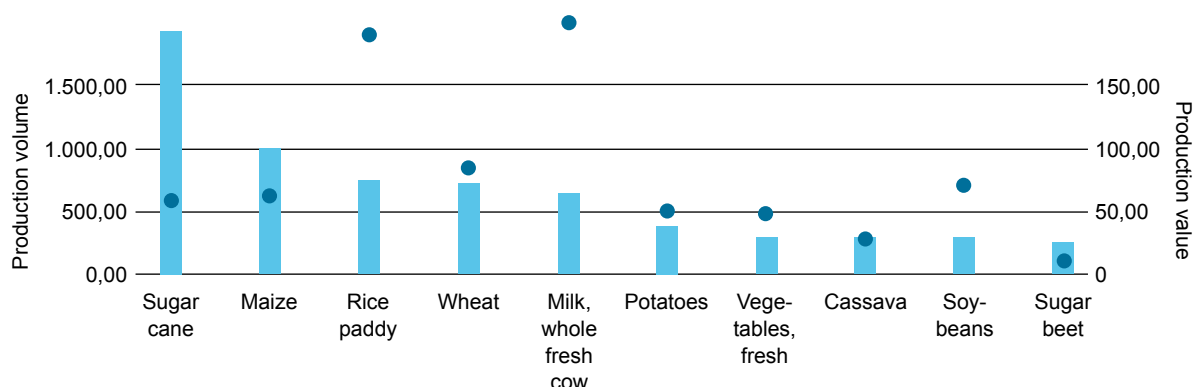


Figure 4:  
Top 10 global crops  
for 2013  
Source: FAO, 2015

■ Production  
(millions of tonnes)  
● Net Production Value  
(Constant 2004-2006  
billions of \$ Int)

Looking more closely at which commodities play a role in this consumption, water consumption (measured in the form of a water footprint, WF) may be broken down between domestically consumed commodities and internationally traded commodities.

Domestically, cereal products represent the largest contribution to the WF of the average consumer (27%), followed by meat (22%) and milk products (7%). Furthermore, on a regional basis, certain commodities are particularly important, especially as it relates to abstraction of water for irrigation. For example, India's irrigation is driven by wheat (33%), followed by rice (24%), and sugarcane (16%). In a number of countries, meat consumption dominates domestic water footprints. For example, in the USA, meat accounts for 30% of the total water footprint.<sup>18</sup>

From an international trade perspective, which is often important for standards, the largest share of virtual water flows relates to trade in oil crops (including cotton, soybean, oil palm, sunflower, rapeseed, and others) and derived products (43% of the total). Of this trade flow, more than half of this amount relates to cotton products, while one-fifth relates to soybean. Other key commodities include: cereals (17%); industrial products (12.2%); coffee, tea, and cocoa (7.9%); and beef cattle products (6.7%).<sup>18</sup> Figure 5 provides an average breakdown of water footprints by commodity on a global basis.

As far back as 2003, when WWF produced a background report on 'Water Use for Agriculture in Priority Rivers Basins', it has also been recognised that there is a difference between developed and developing countries in terms of primary irrigated crops. In developing countries rice, wheat and sugarcane, vegetables and cotton are the dominant irrigated crops. In developed countries, the order is pasture for livestock before cotton, vegetables, corn and vegetables, and rice. The report concluded that four global commodities (so-called 'thirsty crops') should receive priority attention: rice, cotton, sugarcane, and wheat.

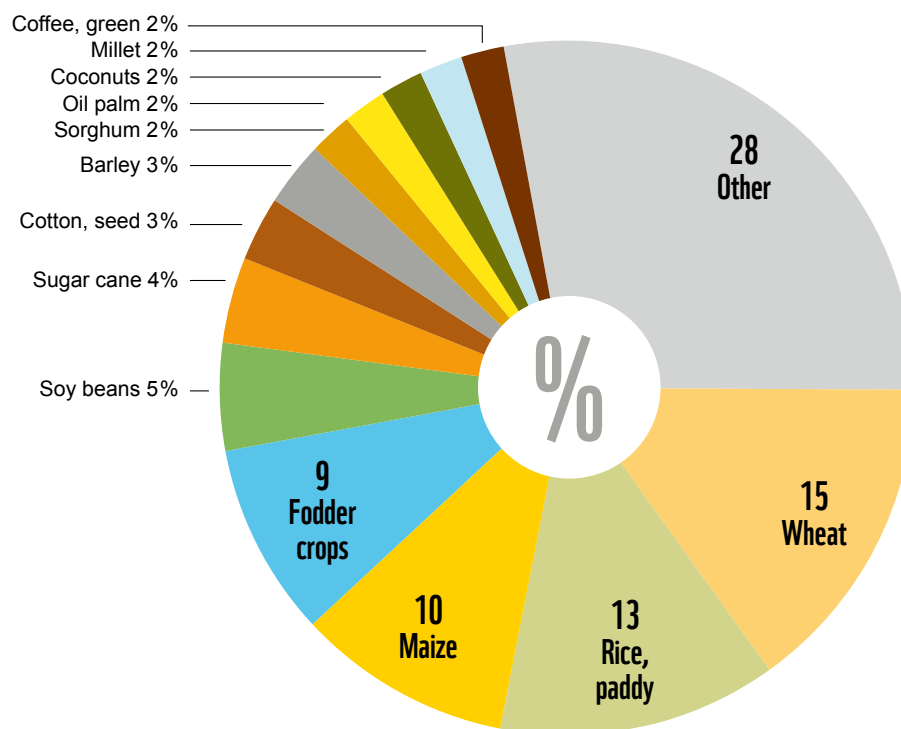


Figure 5:  
Water footprint by  
crop type

Considering the above information, it was necessary to assess a combination of specific commodity standards (see Box 3 on what constitutes a standard) where recognised standards exist (i.e., beef, coffee, cotton, maize/corn, palm oil, rice, soy, and sugarcane), as well as more general agricultural standards that could cover other high water footprint commodities such as wheat (which has no com-

### What constitutes a “standard”?

The term “standard” is employed throughout this study and generally refers to a set of guidelines that outline expected actions or performance by producers. It is important to note that some of these “standards” are codified in a “standard”, while others are codified in legislation, guidance, recommended practices (e.g., “principles & practices” guidance), or other forms. In other words, they all perform similar functions, but have different names, looks and feels. Some are complemented by a certification system (an aspect which WWF believes is critical to ensure credible claims), while others are not. Such certification systems form part of a broader “standard system” in many cases, and are often important in helping to ensure credibility and rigour in implementation and interpretation through the use of trained and qualified, third-party auditors. For example, while the standard itself may not require a stakeholder review, the certification system may indeed require stakeholder input on when the site applies for certification. This study does not explore such “certification system requirements”, and focuses exclusively on written standard’s requirements with the recognition that in some cases, such “requirements” are not mandatory for conformity against the standard. Of particular note are the GRSB, the SAI Platform, and the SRP which are, at present, not accompanied by a certification system, and which many perceive as less rigorous than standard systems with certification.

To help inform what constitutes a credible standard, WWF has developed a set of 16 principles that outline the elements of credible standards and certification systems.

For more details, please see: [http://wwf.panda.org/what\\_we\\_do/how\\_we\\_work/businesses/transforming\\_markets/solutions/certification/](http://wwf.panda.org/what_we_do/how_we_work/businesses/transforming_markets/solutions/certification/)

modity-specific sustainability standard to date), and other cattle fodder crops. Note that for more general agricultural standards (which often have multiple versions for various crops), to ensure a degree of equal comparability, their coffee standards were employed (denoted in Table 1 under “Focus”).

Furthermore, a few additional standards and guidance documents were selected to explore the questions noted in 1.4 (Study Focus & Objectives) regarding the extent to which water-specific guidance documents, standards, and supplementary organic standards can be employed to effectively address water stewardship gaps.

In the end, 17 agricultural standards were selected for assessment that focussed on a range of widely-used commodity production standards. In addition to these, 7 additional standards and guidance documents were evaluated to answer the supplementary questions, for a total of 24 standards.

Specifically related to WWF’s priority commodities, the study covered standards for 7 out of WWF’s 15 priority commodity areas (the others being related to marine ecosystems: whitefish, tuna, wild-caught forage fish, wild-caught shrimp or farmed salmon, farmed shrimp; forests, which are non-agricultural; and dairy, for which no global dairy production standard is yet to be established and accepted).

The full list of standards included in the study is shown in Table 1, page 24.

With a world's population of 9 billion, changing consumption patterns and climate change the pressure on agricultural production systems and freshwater availability will rise. It is time to re-think.



#	Standard Holder Name	Short name	Focus	Full standard reference
1.	4C Association	4C	Coffee	The 4C Code of Conduct - Version 2.0 April 2015
2.	Aquaculture Stewardship Council	ASC	Aquaculture (tilapia)	Tilapia Standard: Version 1.0 January 2012.
3.	Better Cotton Initiative	BCI	Cotton	BCI Production Principles & Criteria, May 2013
4.	Bonsucro	Bonsucro	Sugar Cane	Bonsucro Production Standard Including Bonsucro EU Production Standard, Version 4.01, September 2014
5.	Cotton made in Africa	CmiA	Cotton	Cotton made in Africa (CmiA) – Criteria Matrix Version 3.1 – 15 February 2015
6.	Fairtrade International	Fairtrade	Agriculture (coffee)	Fairtrade Standard for Small Producer Organisations, V1.1 – 1 May 2011
7.	Global Good Agricultural Practices	GLOBAL G.A.P.	Agriculture (coffee)	GLOBALGAP Integrated Farm Assurance – All Farm Base, Crops Base, Coffee (Green) English Version 4.0, edition 4.0-2, March 2013
8.	Global Roundtable for Sustainable Beef	GRSB	Beef	Global Roundtable for Sustainable Beef Principles & Criteria (2014)
9.	International Federation of Organic Agriculture Movements	IFOAM	Agriculture (organic)	The IFOAM NORMS for Organic Production and Processing Version July 2014
10.	ProTerra Foundation	ProTerra	Soy	The ProTerra Standard – Version 3.0 – Approved 28 December 2014
11.	Roundtable on Sustainable Biomaterials	RSB	Maize, Rapeseed, etc.	RSB Principles & Criteria for Sustainable Biofuel Production, RSB-STD-01-001 Version 2.1
12.	Roundtable on Sustainable Palm Oil	RSPO	Palm Oil	RSPO Principles and Criteria for the Production of Sustainable Palm Oil, 2013
13.	Round Table on Responsible Soy	RTRS	Soy	RTRS Standard for Responsible Soy Production Version 2.0, 14 May 2014
14.	Sustainable Agriculture Initiative	SAI	Agriculture (general)	Principles and Practices for the Sustainable Production of Arable & Vegetable Crops – Version 2009
15.	Sustainable Agriculture Network	SAN	Agriculture (coffee)	Sustainable Agriculture Standard (July 2010 Version 3)
16.	Sustainable Rice Platform	SRP	Rice	SRP Guidelines – Updated 10 January 2014
17.	UTZ Certified	UTZ	Coffee	Core code of Conduct (Version 1.0, For individual and multi-site certification, 2014)
Supplemental Standards				
19.	Alliance for Water Stewardship	AWS	Water (site)	Alliance for Water Stewardship Standard – Version 1.0 (April 2014)
20.	International Organisation for Standardization (ISO)	ISO 14046	Water (product LCA)	ISO 14046:2014 - Environmental Management: Water Footprint - Principles, requirements and guidelines
21.	Bioland	Bioland	Agriculture (organic)	Bioland Standards as of 2 November 2013
22.	Naturland	Naturland	Agriculture (organic)	Naturland Standards on Production, Version May 2014
23.	Sustainable Agriculture Initiative	SAI-Water	Water (agriculture)	Principles and Practices for Sustainable Water Management – Version 2010
24.	Sustainable Agriculture Initiative	SAI-Water Stewardship	Water (agriculture)	Water stewardship in sustainable agriculture: beyond the farm towards a catchment approach

Table 1: List of standards included in the study

## 2.2 Development of an Integrated Framework for Assessing Water Stewardship in Standards

Water has long been an issue addressed by standard systems. However, traditionally businesses (and standards) have been focussed on on-site water management approaches (i.e., efficient use of water and ensuring effluent water quality meets certain levels), with little consideration for the larger catchment context, including issues such as cumulative impacts and overall allocations. Experience has shown that such site-focussed “water management” approaches are insufficient to adequately mitigate water risk. For example, a farm that implements precision farming practices with state-of-the-art drip irrigation may still be susceptible to water scarcity issues if other farms in the basin are rapidly depleting groundwater reserves. Indeed there has long been evidence (the so-called Jevons Paradox) that efficiency, no matter how good, will not lead us to sustainable food systems (and in many cases can in fact exacerbate challenges).<sup>20</sup>

Furthermore, existing efforts to evaluate water in standards (e.g., State of Sustainability Initiatives or SSI, Standards Map) have all followed this approach to water management, thereby failing to surface many of the issues that underpin physical, reputational and regulatory water risks.

More specifically, SSI employs four water metrics: Water practices in scarcity (dependencies); Water use in management plan; Water reduction criteria; and Wastewater disposal. In comparison, Standards Map employs ten explicit water metrics: Water resources monitoring and use; Water management plan; Water dependencies; Water use, including reuse and recycling; Wastewater management/treatment; Water contamination/pollution; Mitigation of transboundary effects of water pollution; Water quality; Water disposal/storage; and Water extraction/irrigation.

While these metrics cover a broad array of water management issues, water issues are not always restricted to water quality and quantity. Issues of legality, rights, biodiversity, and many other areas affect water and in turn, how water affects humans and nature. While several of these broader issues are captured by SSI and Standards Map, broadly speaking, the concepts of water stewardship, which get into many of these related (often governance-focussed) issues, are generally poorly reflected in all of the existing evaluation frameworks.

Issues of legality, rights, biodiversity, and many other areas affect water and in turn, humans and nature.

### 2.2.1 Accounting for Water Stewardship

To consistently assess the manner in which different commodity standards’ address water stewardship issues, and not simply water management issues, it was necessary to establish an expanded analytical framework and rubric. The framework needed to be applicable to all types of standards, and applicable to standards developed for all commodities, geographies and sectors. The framework also needed to align and integrate with WWF’s existing approach for the evaluation of standard systems, the Certification Assessment Tool (discussed below).

#### **WWF’s Approach to Water Stewardship**

WWF’s approach to water stewardship, which is directly relevant to commodity production, is outlined in Figure 6. This “ladder” is informed by WWF’s extensive implementation of water stewardship practices on the ground in various sectors over the past ten years. It is worth noting that for food and beverage companies, many of

whom recognise the water risk exposure they face through their supply chains, efforts to take action with suppliers is accounted for in Step 3 (Internal Action) below:



Furthermore, from 2009 to 2014, WWF was heavily engaged in the effort to develop the Alliance for Water Stewardship (AWS) – a new, non-profit organisation dedicated to advancing water stewardship and centred on a global water stewardship standard. WWF’s thinking on water stewardship was a key input in the development of the AWS Standard, which then explored and codified many of the expectations under WWF’s water stewardship ladder.

#### **Alliance for Water Stewardship (AWS) Standard**

The AWS was established in 2009 to promote “responsible use of freshwater that is socially and economically beneficial as well as environmentally sustainable”. It proposes that ‘Environmentally sustainable water use maintains or improves biodiversity and ecological processes at the watershed level. Socially beneficial water use recognises basic human needs and ensures long-term benefits (including economic benefits) for local people and society at large’.

The AWS standard (version 1.0, which was released in 2014), meets many of the key criteria required of a framework for analysing other standards:

- » It focusses specifically on water stewardship, and the impacts of water use.
- » It is designed for global application.
- » It is designed to be applicable to all economic sectors.
- » It takes a catchment-level approach to water use.
- » Its approach is closely aligned with WWF’s understanding of the linkages between environmental objectives and social equity.

The AWS standard focusses on achieving four fundamental ‘outcomes’ of water stewardship that ‘water stewards’ are expected to strive for:

**Outcome 1 – Good Water Governance:** The state when the political, social, economic and administrative systems that are in place, which directly or indirectly affect the use, development and management of water resources and the delivery of water services at all levels of society, promote stakeholder participation, transparency, accountability, rule of law, and equity in a manner that is effective, efficient and enduring, and leads to the desired state of the water resource(s).

**Outcome 2 – Sustainable Water Balance:** The state when the amount and timing of water use, including whether the volumes withdrawn, consumed,

The AWS standard employs a mix of a systems-based and performance-based approach to the assessment of water stewardship.

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diverted and returned at the site and in the catchment are sustainable relative to renewable water supplies and are maintaining environmental flow regimes and renewable aquifer levels.

**Outcome 3 – Good Water Quality Status:** The state when the physical, chemical and biological properties of water, including whether water quality at the site and within the catchment(s) meets local (and, where applicable, international) regulatory requirements and is fit for the requirements of the range of biotic species present and for any human need or purpose.

**Outcome 4 – Healthy status of Important Water Related Areas:** The state when the specific, environmentally, socially, culturally, or economically water-related areas of a catchment, which contribute disproportionately to human wellbeing, are healthy.

The AWS standard employs a mix of a systems-based and performance-based approach to the assessment of water stewardship. The standard's main thrust is to require users to establish a system to ensure they ask the right questions in relation to achieving responsible water use and management in a particular context, and then to guide them towards identifying and implementing effective actions to achieve this.

Furthermore, the AWS Standard, which is included in this analysis and was released in April 2014, can be mapped against the WWF water stewardship ladder to detail some of the best practices involved in water stewardship (Annex A).

The combination of the WWF water stewardship ladder and the AWS Standard provides a robust framework for evaluating progress and coverage of water stewardship practices.

With water stewardship practices largely covered, we next sought to ensure alignment with WWF's Certification Assessment Tool (CAT).

### 2.2.2 Aligning with Existing Evaluation Frameworks

#### The WWF Certification Assessment Tool (CAT)

In parallel to AWS, starting in 2011, WWF worked to develop a standardised framework to assess the requirements of standards and certification systems. Dubbed the "Certification Assessment Tool" or CAT, the tool poses a series of questions related to different aspects of commodity production (and their associated standards) in an effort to determine their comprehensiveness.

The CAT has been informed by experience in working with standard systems, and CAT version 3.9 has been developed over the course of several years through extensive input and experience from the WWF network.<sup>21</sup>

Technically, the CAT is a formalised methodology to evaluate and compare the requirements of standards and certification schemes across an array of issues. CAT assesses standard requirements and a scheme's governance, rules and procedures, as well as the contents of its standard (e.g., legality, tenure & use rights; community relations; workers' rights; water & soil; biodiversity; pollution, waste & GHG emissions; planning & transparency, etc.). The outcome of using the tool is a better understanding of a certification scheme's strengths and weaknesses.


WWF uses CAT assessments to help identify areas for improvement so that they can be addressed as part of a scheme's efforts to further refine and strengthen their systems. CAT assessments can be applied to all sectors and CAT is also aligned to the ITC's Trade for Sustainable Development (T4SD) Standards Map.<sup>22</sup>

While the CAT has long contained specific indicators on water, at the outset of this report, CAT v.3.8 had not developed a detailed approach that integrated water stewardship into its evaluation methodology. CAT v.3.9 now includes key water stewardship elements developed through this study and is consistent with this work.

The six specific indicators related to water use and management in v.3.8 included:

- » Producers are required to identify water resources potentially affected by operations, in as well as outside the management unit.
- » Producers are required to take measures to minimise and mitigate negative impacts from operations on water resources.
- » Producers are not allowed to create or aggravate situations of water scarcity.
- » Producers are required to maintain or improve the quality of surface and ground water.
- » Producers are required to maintain natural wetlands in undrained conditions.
- » Producers are required to avoid or minimise the runoff and siltation of water-courses.

Furthermore, CAT also considers a range of issues that can be affected by water use and management (for example priority habitat conservation, the safeguarding of endangered species, or impacts on local communities), and which affect water availability and quality (such as erosion prevention, or the use of hazardous agrochemicals) or freshwater biodiversity (such as invasive species).



## The WWF Certification Assessment Tool (CAT)

CAT is WWF's official mechanism for comprehensively evaluating the requirements of standards and certifications. CAT may be applied to any standard system and evaluates requirements of both the standard and the associated certification system. Note that CAT, like this study, is not a performance evaluation tool but rather evaluates all of the standard and certification requirements.

Each CAT indicator that was relevant to a sustainability standard's approach to water use and management was considered and allocated into the new integrated framework. Details of this allocation may be found in Annex B.

### **State of Sustainability Initiatives**

Since 2008, the State of Sustainability Initiatives (SSI) report has been providing information to improve the global understanding and learning about the role and potential of market-based voluntary sustainability initiatives such as eco-labels, sustainability standards and roundtables in the promotion of sustainable development.

SSI employs its own framework, composed of 55 indicators, distributed across three critical dimensions (environmental, social, economic). Within this framework, water is largely captured under "Environment" with four key indicators: Indicator #10. Water practices in scarcity (dependencies), #11. Water use in management plans, #12. Water reduction criteria, and #13. Wastewater disposal. There are also some other water-related aspects captured under other index categories such as Soil, Biodiversity, Synthetic Inputs, Human Rights, and Community Involvement. All of the relevant indicators were mapped against the new Integrated Water Stewardship and Standards Assessment Framework.

### **ITC Standards Map**

Lastly, since 2011, the International Trade Centre has worked to develop a global database on standards that provides "comprehensive, verified and transparent information on voluntary sustainability standards and other similar initiatives covering issues such as food quality and safety"<sup>18</sup> Standards Map covers a broad array of indicators with 9 specifically within the "Water" sub-area: Water management plan, Water resources monitoring and use, Water dependencies, Water extraction/irrigation, Water use including reuse and recycling, Wastewater management/treatment, Water contamination/pollution, Water quality, Water disposal/storage. In addition to these, there are several other water-related requirements under other areas, such as Soil, Chemicals/Natural Organic Inputs, Biodiversity, Waste, Human Rights and Local Communities, Conditions of Work, and Sustainable Management Criteria. As with SSI, all of the relevant indicators were mapped against the new Integrated Water Stewardship and Standards Assessment Framework.

## **2.2.3 Presenting a New Integrated Water Stewardship & Standards Assessment Framework**

The combination of the various sources noted above into an integrated framework helped to ensure a robust and comprehensive approach – not only for this assessment, but to feed back to the other standards evaluation platforms (i.e., CAT, SSI and Standards Map) on how to better incorporate water stewardship into standards evaluation efforts.

The four high-level water stewardship outcome areas were drawn from AWS, and then a combination of the WWF CAT indicators and the AWS standard requirements (aligned to the WWF water stewardship ladder) were employed to create a list of 27 criteria. These were then cross-checked against the requirements outlined in the SSI framework and the Standards Map framework to ensure comprehensive coverage (Annex B). A summary of the resulting Integrated Water Stewardship & Standards Assessment Framework is presented in Table 2, page 30/31.

Criteria	General Description
<b>1. Water Governance and Management</b>	
<b>Water as a Priority Area within the Standard</b>	Water highlighted as an issue at the level of Principle (or equivalent), and/or all aspects of four key 'water stewardship outcomes' (governance, balance, quality and habitats) are clearly highlighted within standard.
<b>Legal Compliance</b>	There is a generic reference to legal compliance that would cover compliance with legal requirements related to water (e.g. abstraction, effluent) and/or specific reference to legal compliance in relation to water and implies some form of verification of compliance.
<b>Land and Water Rights (Indigenous Peoples' Rights, Traditional Use Rights, including Free, Prior and Informed Consent where applicable)</b>	There is explicit reference to compliance with indigenous and/or local communities water rights, either referred to directly or else referred to by reference to International Labour Organization Convention Number 169 (ILO 169) <sup>24</sup> , UN Declaration of Rights of Indigenous Peoples <sup>25</sup> , or to national legislation which acknowledges such rights; OR there is reference to the principle of Free, Prior and Informed Consent (FPIC) which would be expected to result in rights being recognised and respected in practice. <u>Note</u> : FPIC issues are restricted to this element within the assessment framework.
<b>Consideration of Catchment Context</b>	There is explicit reference to the need for water users to be aware of the overall situation of water use and availability at the catchment level, including identifying and understanding shared water infrastructure, and an explicit requirement to work within the limitations of water use through catchment-level governance mechanisms.
<b>Environmental and Social Impact Assessment</b>	There is an explicit requirement to carry out an assessment of the social and environmental impacts of the organisation's water use, and/or a generic requirement to carry out an Environmental and Social Impact Assessment (ESIA) with sufficient guidance to give confidence that it would include consideration of the impacts of water use.
<b>Adaptive Water Management Plan/ Policy</b>	There is an explicit requirement for users to develop an adaptive 'water management plan or policy' that brings together the main elements of water management within an integrated framework that outlined accountabilities.
<b>Transparency, Disclosure and Stakeholder Consultation</b>	There are explicit requirements for the organisation to make information about its planned and actual water use publicly available, and to consult with affected stakeholders in relation to its plans.
<b>Dispute Resolution</b>	There are explicit requirements for processes to be in place that would allow stakeholders to bring concerns related to the organisation's water use to the organisation's attention, and that would oblige the organisation to make a serious effort to resolve any such issues to the satisfaction of the complainant, including the possibility of compensation. <u>NOTE</u> : General stakeholder feedback mechanisms are covered above; it must involve a requirement related to dispute resolution.
<b>Catchment-level Collaboration / Collective Action</b>	There are explicit requirements in place for the organisation to identify and collaborate with other water users in the catchment, either directly or else through participation in existing catchment level associations or plans, to address catchment level issues. <u>Note</u> : Local supply chain requirements are accounted for under the following criterion (indirect water use & supply chain).
<b>Consideration of Indirect Water Use and supply Chain Engagement</b>	The organisation is required to identify its indirect water use and, if this is significant, to implement actions to reduce the impact of such indirect use, most notably in the supply chain.
<b>Future Scenario &amp; Resilience Planning</b>	The organisation is required to identify projections for water use in its catchment in the long term (e.g., to consider the implications of climate change projections and population growth) and to consider the implications (i.e., resilience requirements) for the sustainability of its own water needs.
<b>Formal Leadership Commitment on Water</b>	There is a requirement for a form of organisational leadership (e.g., leader/board/etc.) to have a formal, signed commitment to address water issues within and beyond the site.
<b>Water, Sanitation and Hygiene for Staff</b>	The standard has explicit provisions that require the site to take actions to provide water, sanitation and hygiene awareness to staff.
<b>Water Risk Assessment</b>	There is an explicit requirement for users to assess and consider water risks (i.e., physical, regulatory and reputational water risks) and/or considerations of water-related emergency incidents and their potential impacts on the site and the catchment.
<b>Positive Participation in Catchment Governance and Policy Engagement</b>	There is an explicit requirement to engage catchment-level governance mechanisms (e.g., coordinating efforts) or on water policy issues.

Criteria	General Description
<b>2. Water Balance</b>	
<b>Quantitative Water Use Information (environmental flow, water use, net withdrawal, monitoring)</b>	The organisation is required to collect or at least have access to information about its own planned and actual water use on a monthly basis over the year, and has information about the availability of any 'blue water' it would need to use to meet its needs. The organisation has information about the efficiency of its water use (e.g. use per unit of production). There is evidence that its water needs can be met without compromising the environmental flow requirements <sup>26</sup> of any affected water courses.
<b>Water Use Efficiency</b>	The organisation is required to implement all applicable and effective actions to ensure that its own water use is minimised. Measures may include: prohibition of irrigation; efficient irrigation; soil management; proactive support for water re-use or recycling.
<b>Absolute Quantitative Water Use Limitations (surface and ground-water)</b>	There are clear, explicit limitations that would prevent the organisation withdrawing water if this would compromise the 'environmental flow' requirements of any affected water courses.
<b>3. Water Quality Status</b>	
<b>Qualitative Water Use Information (indicators, monitoring)</b>	The organisation is required to collect or at least have access to appropriate information about any impacts it may have on water quality. Information may include measurement of water quality of any waste water, measurement of water quality of water sources at the point of use and at the point that water leaves the organisation's sphere of influence. Measurements include key aspects of water quality that might be affected by the organisation's activities, such as pH, temperature, COD, sediment load, pesticide pollution, nitrate level, etc.
<b>Effluent Management: fertilizer, pesticides, soil management/ erosion, waste management</b>	The organisation is required to implement all applicable and effective actions to ensure that its own negative impacts on water quality are minimised. Measures may include: prohibitions on pesticide use; effective limitations on pesticide use; effective limitations on fertiliser use to ensure there is no excess nutrients entering water courses; measures to prevent soil erosion; measures to clean waste water, etc.
<b>Absolute Water Quality Limitations</b>	There are clear, explicit thresholds defining impacts on water quality, such that if the organisation causes any significant negative impact on water quality it could not be certified.
<b>4. Important Water Related Areas</b>	
<b>Management of Riparian, Wetland and other Water-related Habitat Areas</b>	The organisation is required to identify, map, protect, and manage or restore riparian, wetland and other significant water-related habitats on its property in ways that protect water-related biodiversity, preferably based on an integrated biodiversity management plan with a clear indication that it would include the consideration of water-related habitats.
<b>Management of Water-related Areas of Religious, Cultural or other Social Importance</b>	The organisation is required to identify, map, protect, and manage or restore water-related areas of religious, cultural or other social importance on its property. A generic reference to the HCV concept should be supported by explicit reference to the need to protect areas with high social values.
<b>Water-related Land Use Conversion (Past and Future) and Restoration</b>	The standard has explicit provisions to prevent the conversion of water-related areas that are likely to have high conservation value, either before or during the period during which the property is certified.
<b>Rare, Threatened and Endangered Freshwater Species</b>	The standard has explicit provisions, in addition to any general requirements for protecting riparian or wetland habitats on its property, designed to ensure the protection of any rare, threatened or endangered species that may be affected by the organisation's activities in relation to water or water-related habitats, e.g. through special programs to identify and protect such species, through the identification and protection of nest sites, feeding areas, etc; and through measures to prevent hunting or fishing. A generic reference to the HCV concept should be supported by explicit reference to the need to protect RTE species.
<b>Aquatic Invasive Species</b>	The standard has explicit provisions that effectively prevent any accidental release or introduction by the organisation of invasive species (animal or plant) that would have any deleterious effect on riparian ecology, including e.g. fish escapes, escapes of animals that prey on water-related species, species that have a negative impact on water-related habitats, etc. Where invasive species are already present, there is a requirement to take effective action to limit any damage caused by the invasive species.
<b>Ecosystem Services</b>	<b>The standard has an explicit requirement to identify, understand, and maintain/enhance water-related ecosystem services in affected/reliant catchments.</b>

Table 2: Summary of the Integrated Water Stewardship & Standards Assessment Framework

The above framework, which was entitled the Integrated Water Stewardship and Standards Assessment Framework (or simple “the Framework” from this point forward in the study), provided the basis for the study’s assessment of commodity standards.

In addition, the process of developing the Framework also shed light upon how larger evaluation efforts like SSI, Standards Map, and CAT might be enhanced to better address the state of the art on water stewardship. These conclusions and recommendations are outlined in Section 6 (Recommendations & Conclusions) of the study.

## 2.3 Assessment Methodology

To understand the coverage of water stewardship requirements and offer constructive pathways for standard systems to address the water risks facing their users, the requirements as outlined in each standard’s principles, criteria and indicators were evaluated against the Framework (Table 2). For every requirement, one of four scores were assigned ranging from zero to three, each with a qualitative description employed to best match to the requirements from a given standard. This “rubric”, a guide listing specific attributes for each category in the Framework, was the basis for scoring each standard system.

Score and colour code	Grade and description
<b>Score 0</b>	<b>No significant fulfilment of criterion</b> The standard has no explicit elements that would be expected to make a significant contribution to the framework criterion, or elements may be mentioned in an extremely vague way, with no indication that applicants would in practice be expected to take action to address the issue.
<b>Score 1</b>	<b>Limited fulfilment of criterion / indirectly referenced (significant gaps)</b> The standard addresses limited elements of the framework criterion, but also misses out some significant elements; indirectly references or addresses the criterion but without giving enough detail to give confidence of consistent implementation; or, addresses the main elements of the framework but in a way that even in the long term compliance is voluntary.
<b>Score 2</b>	<b>General fulfilment of criterion (limited gaps)</b> The standard explicitly addresses the framework criterion, and includes sufficient detail to give confidence in effective and consistent implementation, but it is still limited in some manner (often not providing water-specific elements). In many cases a score of 2 indicates coverage that could be further improved.
<b>Score 3</b>	<b>Substantive fulfilment of criterion (very limited/no gaps)</b> The standard substantively and comprehensively addresses the framework criterion, often with water-specific references, and includes sufficient detail to give confidence in effective and consistent implementation. A score of 3 often represents a leading example of how to ensure water is explicitly covered, and where improvements could be made to requirements scoring a 3, they tend to be minor adjustments.

Table 3:  
The scoring system  
employed for the 27  
criteria in the assessment  
framework

For the assessment, the requirements specified in each selected standard were cross-referenced against the 27 criteria of the framework, together with brief notes on their content. The standards were then graded as to the extent to which their content addressed the elements of each assessment criterion in accordance with the following categories (Table 3):

In general, a score of 0 or 1 indicates a gap while a 2 or 3 does cover the issue but to a greater or lesser extent when it comes to water. The authors do recognise that in many cases, a score of 2 may be more than sufficient to cover water issues, but given that water issues are often overlooked, scores of 3 have been largely reserved for those requirements that explicitly address water issues. In all cases, a score of 1 or 0 indicates a lack of coverage, but this may be due to immateriality due to local conditions, commodity specific requirements, or the aims of the standard system.

On the basis of the rubric, each individual standard's principles, criteria and indicators (or functionally equivalent requirements) in the study was reviewed and scored.

Several of the systems in the study have standards with different modules, or versions, applicable to different production systems. For example, the GLOBAL G.A.P. standard has a range of different modules applicable to crops or livestock production, and then different sub-modules applicable to different kinds of crops, or to the management of different kinds of livestock. Where such options existed the modules related to crop production (rather than livestock production) were selected, and options for coffee production (or in one case generic 'tropical plantation' production) were chosen in order to increase the comparability of results.

Once all of the standards were scored, the scores were checked against the standard owner-generated information provided on ITC's Standards Map to ensure broad agreement between this assessment and the standard system's own input.

Each standard's requirements (as outlined in their principles, criteria and indicators) were scored and colour-coded in the assessment framework, with substantive fulfilment being scored as 3 (dark blue), general fulfilment being scored as 2 (medium blue), limited fulfilment being scored as 1 (light blue), and no significant fulfilment being scored as 0 (white), as shown in Table 3. In cases where the decision could have gone in either direction, the more generous grade was generally given. The authors recognise that a degree of subjectivity is employed in this exercise and grading is subject to adjustment based on nuance, however, in most cases this represents a shift up or down of one number, but not a major shift (i.e., it is highly unlikely that individuals would score a 0 versus a 3). These results are presented in Table 4 below.

Finally, the average grades for each of the framework's four high-level areas (water governance, water balance, water quality and important water-related areas) were combined by adding their scores and presenting the total as a percentage of the maximum possible score (scoring a 3 for every criterion). These final combined scores (Table 5) were colour-coded according to score (arbitrarily at 0–25 %, 26–50 %, 51–75 %, and 76–100 % of the maximum possible score). These values were then averaged to provide an aggregate average for each standard system.

It is important to note some of the limitations of the assessment approach employed in this study. A detailed explanation of the key points below may be found in Annex C.

**The grades in the tables should be taken as roughly indicative only. The table does provide a high-level, visual overview of where standard systems are more or less comprehensive in their coverage of water stewardship issues.**

**Conversely, the table should not be used to assess whether one or other standard is ‘better’ or ‘worse’ than the others.** Each standard needs to be considered in its own context, and if comparison is required to be compared with others that might be used to achieve the same or similar goals within that context using the specifics of the given standards involved.

## 2.4 Mapping Commodity Water Risks

Finally, in order to better tailor the recommendations, and to recognise that not all commodities and all geographies face similar water challenges, a set of commodity maps were developed for the following crops:

- » beef,
- » coffee,
- » cotton,
- » maize/corn,
- » palm oil,
- » rice,
- » soy, and
- » sugarcane.

The water risk data, which is restricted to physical water risks, was drawn from the WWF Water Risk Filter, which combines a number of physical water risk data sets<sup>27</sup> into basin-level water risk scores. These basin scores were then masked to only show areas of commodity production.<sup>28</sup> The aggregated maps, which help to better tailor recommendations, are presented in Section 5.3 (Exploring Commodity Water Risk Maps), while the full array of maps may be found in Annex D.

# 3

## Reviewing the Current Coverage of Water Stewardship

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### 3.1 Summary of Assessment Results of Commodity Standards

A summary of the assessment results may be found in Tables 4 and 5 (page 35/36).

Table 4:  
Summary of coverage  
regarding water in select  
commodity standards  
across all 27 criteria

	1. 4C Association	2. ASC	3. BCI	4. Bonsucro	5. Cotton Made In Africa	6. Fairtrade	7. GLOBALG.A.P.	8. Global Roundtable for Sustain. Beef	9. IFOAM	10. ProTerra	11. RSB	12. RSPO	13. RTRS	14. SAI - Arable Crops	15. SAN	16. SRP	17. UTZ	Average score
<b>1. Water Governance</b>																		1.33
Water as a priority area within the standard	2	3	3	2	2	2	2	2	2	3	3	2	2	3	3	2	2	2,4
Water, sanitation & hygiene for staff	2	1	2	2	0	3	3	0	2	2	3	2	2	3	3	3	3	2,1
Legal compliance	2	3	2	3	2	2	2	2	1	2	2	2	2	1	3	3	2	2,1
Consideration of catchment context	2	2	1	1	0	2	2	1	1	2	3	3	2	2	2	2	2	1,8
Adaptive water management plan/policy	0	1	0	2	2	1	3	0	0	2	3	3	2	1	3	3	2	1,6
Land and water rights	1	2	1	2	0	0	1	2	2	2	3	3	2	0	2	2	2	1,6
Transparency & stakeholder consultation	1	1	0	2	2	1	1	1	0	2	3	3	2	1	2	1	0	1,4
Water risk assessment	1	1	0	0	0	1	3	0	1	1	2	2	1	3	2	2	2	1,3
Dispute resolution	0	2	1	3	2	0	2	0	0	2	3	2	2	0	1	1	1	1,3
Environmental & social impact assessment	0	2	0	2	2	0	1	0	0	2	3	3	2	1	2	0	1	1,2
Catchment-level collaboration / collective action	2	0	0	0	1	0	1	0	0	0	2	1	1	2	3	3	0	0,9
Indirect water use & supply chain engagement	2	1	0	2	0	0	0	2	1	2	0	1	0	2	1	0	0	0,8
Future scenario & resilience planning	0	0	0	0	0	0	2	1	0	3	0	0	1	0	0	3	2	0,7
Formal leadership commitment on water	0	0	0	2	0	0	3	0	0	0	0	0	0	0	1	0	0	0,4
Participation in catchment governance & policy	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0	0,3
	1,0	1,3	0,7	1,5	0,9	0,8	1,8	0,7	0,7	1,7	2,0	1,8	1,4	1,3	1,9	1,9	1,3	
<b>2. Water Balance</b>																		1.75
Water use efficiency	2	0	2	3	2	1	3	2	2	3	2	2	3	3	2	2	3	2,2
Quantitative water use information	1	0	0	2	0	1	3	1	2	2	3	2	2	2	2	2	2	1,6
Absolute water quantity limitations	2	1	1	0	3	0	1	0	2	2	2	2	2	2	1	2	2	1,5
	1,7	0,3	1,0	1,7	1,7	0,7	2,3	1,0	2,0	2,3	2,3	2,0	2,3	2,3	1,7	2,0	2,3	
<b>3. Water Quality Status</b>																		1.74
Water effluent management	2	2	2	3	2	2	3	2	2	3	3	2	3	3	3	3	2	2,5
Qualitative water use information	2	2	0	2	0	1	2	2	1	3	3	2	2	3	2	2	2	1,8
Absolute water quality limitations	2	1	1	2	1	1	2	0	2	2	2	2	2	2	2	2	2	1,6
	2,0	1,5	0,5	2,0	0,5	1,0	2,0	1,0	1,5	2,5	2,5	2,0	2,0	2,5	2,0	2,0	2,0	
<b>4. Important Water-related Areas</b>																		1.57
Management of water-related habitat areas	2	1	2	2	2	2	2	2	2	2	3	3	3	2	3	3	3	2,3
Water-related land cover conversion & restoration	2	2	0	2	3	2	2	3	2	3	3	3	3	0	3	2	2	2,2
Rare, threatened & endangered freshw. species	2	2	0	2	0	2	2	1	1	2	2	2	2	2	2	2	2	1,6
Management of water-related socio-cultural areas	0	2	0	2	0	2	1	2	1	2	1	2	2	0	2	1	2	1,3
Ecosystem services	0	0	0	2	0	2	0	2	0	2	2	2	2	0	1	2	1	1,1
Aquatic invasive species	0	1	0	0	0	2	0	0	0	2	2	2	2	2	1	2	0	0,9
	1,0	1,3	0,3	1,7	0,8	2,0	1,2	1,7	1,0	2,2	2,2	2,3	2,3	1,0	2,0	2,0	1,7	

Table 5:  
Summary of coverage  
regarding water across  
the four water stewardship  
outcomes

	1. 4C Association	2. ASC	3. BCI	4. Bonsucro	5. Cotton Made In Africa	6. Fairtrade	7. GLOBALG.A.P.	8. Global Roundtable for Sustain. Beef	9. IFOAM	10. ProTerra	11. RSB	12. RSPO	13. RTRS	14. SAI - Arable Crops	15. SAN	16. SRP	17. UTZ	Average score
1. Water Governance	33	42	22	51	29	22	60	24	22	58	67	60	47	42	62	62	42	43,75
2. Water Balance	56	11	33	56	56	22	78	33	67	78	78	67	78	78	56	67	78	58,33
3. Water Quality Status	67	56	33	78	33	44	78	44	56	89	89	67	78	89	78	78	67	65,97
4. Important Water-related areas	33	44	11	56	28	67	39	56	33	72	72	78	78	33	67	67	56	53,47
<b>Averages</b>	<b>47</b>	<b>38</b>	<b>25</b>	<b>60</b>	<b>36</b>	<b>39</b>	<b>64</b>	<b>39</b>	<b>44</b>	<b>74</b>	<b>76</b>	<b>68</b>	<b>70</b>	<b>61</b>	<b>66</b>	<b>68</b>	<b>61</b>	

In addition, Table 5 provides a summary of the coverage across the four water stewardship outcomes.

The study's general findings from the assessment (Tables 4 and 5) are reviewed from various perspectives. Section 4 (Observations) explores how water stewardship issues are addressed in general by commodity standards. This perspective is broken down by each of the broad water stewardship areas (i.e., Governance – Table 6, Balance – Table 7, Quality – Table 8 and Important Water-related Areas – Table 9).

Furthermore, Section 5 (Strengthening Standards) explores how are standards may respond to gaps in light of the respective water risks facing their growers. Firstly, it explores the role of water-specific guidance in strengthening water stewardship. Secondly, it also explores two specific cases involving collaboration, the results of which are presented in Section 5.

Finally, Section 6 (Recommendations & Conclusions) pulls together the overall trends to provide broad recommendations to various audiences.

In all of the following sections, the intent is to highlight major points of interest, not to analyse the results for every issue and every standard in detail.

## 4 Observations in Relation to Specific Criteria and four AWS 'Water Stewardship Outcomes'

In general, the different standards involved in this study have a reasonable coverage of water issues, but tend to cover more “traditional water management” elements such as impact assessment, a management plan, water efficiency, water quality impacts and management of water-related habitats such as wetlands and riparian areas.

The following four sub-sections provide some general interpretation of the results broken down by each of the four water stewardship areas.

### 4.1 Water Governance

Water governance was the weakest overall outcome area. It is also the area that most distinguishes water stewardship from traditional water management in that involves more “consideration and engagement beyond the fenceline”. Table 6 provides a breakdown of which areas of water governance were reasonably well covered, versus those that were either poorly or very poorly covered

Table 6:  
Coverage of water  
governance issues

Reasonably well covered (3.0-1.5)	Poorly covered (1.4 – 1.0)	Very poorly covered (0.9 – 0.0)
Water management as a priority (2.4)	Transparency & Stakeholder engagement (1.4)	Catchment collaboration / collective action (0.9)
Water, Sanitation & Hygiene (2.1)	Dispute resolution (1.3)	Indirect water use assessment (0.8)
Legal compliance (2.1)	Water risk assessment (1.3)	Future scenario and resilience planning (0.7)
Water management plan (1.8)	Environmental & Social Impact (1.2)	Formal leadership commitment (0.4)
Catchment context (1.6)		Participation in catchment governance (0.3)
Land and water rights (1.6)		

#### Reasonably well covered

Most standards did identify water management as an issue that merited specific consideration at the criterion level.

Water rights issues were handled in a somewhat binary fashion: typically either comprehensively addressed (e.g., RSB, RSPO), or left unaddressed entirely (e.g., CmiA, ISO 14046). Several standards (e.g., Naturland, GRSB, 4C) referenced UN declarations and Rugge’s 2008 guidance on interpretation, but virtually none (AWS being one notable exception) explicitly referenced the 2010 UN declaration on the role of corporations in respecting the human right to water and sanitation.<sup>29</sup> Similarly, while a little over half of the standards contained a reference to workers’ rights to have access to safe drinking water, or access to sanitation or provision of hygiene (WASH), only about a quarter of the standards comprehensively covered all three of these basic human rights (of note were, in alphabetical order, AWS, Fairtrade, GLOBALG.A.P., ProTerra, RSB, SAI - Arable Crops, SAN, SRP, and UTZ), with several only referencing WASH for those living on site, rather than all workers operating on site.

Legal compliance was also quite common via the use of broader “legal compli-

ance” requirements throughout most of the standards assessed in this study. While scores of three were reserved for those standards specifically referencing water-related compliance (the rationale being that legal water use is a particularly important aspect for growers), it is recognised that broader legal compliance (i.e., a score of two or three) generally suffices, thus only scores of 0 and 1 merit much consideration (>80 % of the standards scored 2+).

Management plans were typically addressed through broader mechanisms (i.e., general environmental management plans) with only a few standards (e.g., 4C, AWS, SAI – Water Management, SAN, SRP, RSB, and RSPO) calling out specific water management plans.

Catchment context was variable and often very generic (e.g., ‘impacts on communities or water bodies’) without specific water considerations incorporated, especially related to water infrastructure (either natural or built infrastructure). These were often linked to ESIA efforts and were rarely comprehensively evaluated catchment information. Of note in their strength on catchment context were AWS, the SAI Water Stewardship guidelines, RSB, and RSPO).

#### **Poorly covered**

Similar to water management plans, transparency and stakeholder consultation, dispute resolution and water risk assessment were all also typically addressed through broader mechanisms (e.g., broad principles on stakeholder engagement/dispute resolution, or ‘risk assessment’). Where water risk assessments were explicitly noted (e.g., GLOBALG.A.P., SAI – Arable Crops), they typically focussed on physical water risks with only AWS and the SAI – Water Stewardship Guidelines (and to a lesser extent the Sustainable Water Management Principles and Practices) touched upon the notion of assessing reputational and regulatory water risks.

While about a third of the standards explicitly referenced some form of ESIA, another third touched upon ‘impacts’ without specific reference to ESIA (or the like), leaving the final third not mentioning the issue (i.e., out of scope). Upstream issues (notably sources and other upstream water users) were particularly weak with very few standards considering the ramifications of how others could affect your water.

#### **Very poorly covered**

The majority of the issues that were poorly covered are those that distinguish the concept of water stewardship from water management. This would suggest that many of the elements that define the “water stewardship” approach have yet to penetrate most natural resource standard requirements.

**Very few standards considered the need for future scenario and resilience planning.**

More specifically, very few standards considered the need for future scenario and resilience planning (notable exceptions being AWS, ProTerra, SAI Water Stewardship Guidelines and SRP). It may not be surprising that producers are not being asked to consider these issues given their complexity and the challenges in terms of response (especially for standards that are targeted at small-scale producers, such as BCI, CmiA, and Fairtrade). Nonetheless, given that it is widely accepted that the greatest impacts of climate change on human well-being will be through changes to precipitation patterns, it is surprising that the issue is not mentioned in standards that aim to address agricultural sustainability. It is also worth highlighting that in reviewing older (c. 2010) versions of standards versus newer (c. 2014) versions, several standards have moved to incorporate action to mitigate impacts of climate change/resilience (e.g., UTZ 2010 vs. 2014). This

might suggest that in time, this issue will become more pervasive in standards.

There were a few instances of encouragement for collective action (e.g., AWS, RSB, SAI Water Stewardship Guidelines, & SRP). In some cases this was little more than the recommendation that producers should take part in regional activities where they exist; in others there were requirements to take part in catchment-level conservation efforts, or to contribute to the maintenance of infrastructure off-site (e.g., in the Sustainable Agriculture Network standard) or restoration efforts (e.g., RSB). Unfortunately requirements around voluntary coordination with public sector agencies on shared governance challenges remains a weak aspect of many standards.

When generic agricultural standards are applied to animal husbandry the impacts of indirect water use may be of more significance via feed and supplier requirements.

The issue of indirect water use is perhaps not of such concern in the context of primary production, particularly given the focus on agriculture rather than animal husbandry. Direct water use is likely to be of much greater significance. Nonetheless when generic agricultural standards are applied to animal husbandry the impacts of indirect water use may be of more significance via feed and supplier requirements (ASC is notable in its requirements to source from sustainable feed). Similarly, where there are significant inputs (in the form of fertilisers, pesticides, etc.) there may be material with respect to pollution impacts associated with the production of such products (application of these would be captured under site effluent and water quality requirements). One notable practice, as outlined by standards such as 4C, requires supply chain partners dealing with water (waste water in this specific case), to be aware of the importance of its treatment. Lastly, while out of scope for this study, it is also worth pointing out that there is a significant opportunity to account for indirect water use via chain-of-custody (CoC) standards that exist as a part of a broader standard system. While to date, CoC requirements have tended to be a matter of tracking only, considering the water footprint at each step would be a significant improvement in understanding the impacts of water use throughout production processes (i.e., value chain).

Lastly only two standards (AWS and SRP) required any substantive engagement in catchment governance or public policy. While a couple of the standards (e.g., GLOBALG.A.P., ProTerra, RTRS) mentioned the notion of engaging (“notification of” or “advice from”) authorities (regarding invasive species and water abstraction), these did not truly touch upon the notion of catchment governance. One standard that is worth noting that did contain a requirement on catchment governance was the Sustainable Rice Platform (which is currently under development). SRP contained a requirement to “Use integrated water resource management (IWRM) techniques. Actively participate in watershed management and community water infrastructure projects where applicable. Promote equitable water distribution through community irrigation planning.” This example was worth flagging as a template for others to consider following.

Table 7:  
Coverage of water  
balance issues

## 4.2 Water Balance

Reasonably well covered (3.0-1.5)	Poorly covered (1.4 – 1.0)	Very poorly covered (0.9 – 0.0)
Water use efficiency (2.2)		
Quantitative water use information (1.6)		
Absolute quantitative water use limitations (1.5)		

### Reasonably well covered

Most (60 %) of the standards included significant requirements related to water use efficiency: For example in terms of managing (or in some cases prohibiting) irrigation, ‘water conservation programs’, ‘taking account of efficiency’ and the like. Most of the water use efficiency requirements related to irrigation (i.e., “blue water” use), though some standards (e.g., SAI – Arable Crops, UTZ) did take into account crop selection to consider the commodity’s natural consumption (i.e., “green water” use).

While virtually all (90 %) of the standards required some form of collection of water use data, in most cases this was implicit (i.e., requirements implied that certified sites had to know how much they used compared to some quantitative baseline to conform with ‘sustainable water use’) rather than explicit requirements to “measure water consumption/withdrawals”. Indeed, very few standards required explicit water withdrawal and consumption data to be gathered, though it is worth noting that supplementary guidance documents were often explicit on this front (e.g., RSB, SAI - Water Management). Similarly, very few standards required information to be collected in relation to the availability of water for human use considerations have been taken into account. It should also be noted that none with the exception of the RSB guidance made mention of environmental flow requirements to be accounted for in the determination of water availability.

The other gap area with respect to water balance information was with respect to absolute limitations on water use. Only one standard (CmiA, which prevents irrigated water use) specified a clear form of absolute limitations in relation to water use for production. Most standards that did have some coverage of absolute water use employed relatively vague references to the use of ‘sustainable’ water sources without provisions of how to determine said ‘sustainability’.

It is possible that restrictions on water consumption are generally addressed satisfactorily through the application of national laws and regulations, and as a consequence that there is no need to stipulate additional requirements in a sustainability standard. However, such assumptions have proven false in many jurisdictions where legislation has failed to address cumulative water consumption.

It is also clearly the case that limitations on water consumption often need to be addressed at the catchment-level, and few standards examine catchment level issues at all. One could conclude that understanding catchment water availability (especially in the medium to long term) is a fundamental and yet extremely challenging issue facing commodity producers. Furthermore, it is an aspect of water use that, at least at present, is not being addressed comprehensively by most agricultural sustainability standards. This is of particular concern since without specific limits for all users within a catchment, physical water scarcity risks will never be fully mitigated.

Table 8:  
Coverage of water  
quality issues

## 4.3 Water Quality

Reasonably well covered (3.0 – 1.5)	Poorly covered (1.4 – 1.0)	Very poorly covered (0.9 – 0.0)
Water effluent management (2.5)		
Qualitative water use information (1.8)		
Absolute water quality limitations (1.6)		

In contrast to water use efficiency requirements (...), the requirements for water quality tended to be more specific and tangible.

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### **Reasonably well covered**

Water quality is a reasonably well covered area within standard systems. As in the case of water balance, almost all standards included significant requirements intended to reduce or minimise producers' impacts on water quality. In contrast to water use efficiency requirements (which were often vague), the requirements for water quality tended to be more specific and tangible; they typically included specific restrictions on the use (including storage, application and disposal) of pesticides; the storage and application of fertilisers; measures to prevent soil erosion; the application of sewage or sewage sludge; and the treatment of wastewater. Chemicals were often explicitly listed with permissible concentrations sometimes noted. In general, water quality management was the strongest requirement found across the standard systems with all standard systems requiring some form of water quality management. Of particular note in this regard are the IFOAM (and related Naturland and Bioland) standards, which have restrictions on synthetic pesticides that have linked benefits on water quality. Even where water quality requirements were quite extensive (e.g., 4C, IFOAM, Fairtrade, RSPO, UTZ), standards often lacked reference to pursue best management practices and engage in continual improvement.

Similarly to the issue of water balance, relatively few standards specified requirements to monitor water quality, or specified absolute restrictions in terms of level of acceptable impact on water quality.

Where water quality had to be monitored this was often considered as a food safety issue (e.g., SAI – Arable Crops), in order to make sure that water used for irrigation or washing produce meets food hygiene standards. Very few standards specified any requirements to monitor the quality of water before and after an organisation's use (so as to verify any effects the user might have on water quality), leaving standards open to reputational and regulatory water risks.

Different standards can clearly take quite different approaches to the management of water quality: One standard may place an emphasis on the tight management of activities (e.g., Bonsucro, Fairtrade) that might result in water pollution and consider the monitoring of quality to be an unnecessary cost; another might stipulate 'no pollution' and leave it to the individual user to decide what action to take to achieve this (e.g., RSPO); while others still employ a mix of these approaches (e.g., SAN). Nonetheless, it was a potential concern that many standards appeared to assume that the recommended measures to protect water quality (e.g., through controls on the use of fertiliser, whether organic or inorganic, or pesticides) would be sufficient. Few (ProTerra, RSB, RTRS, SAN, SRP being notable exceptions) stipulated any requirement to monitor the effectiveness of the measures in practice, nor any implications for compliance if the standards were not as effective in practice as expected in theory. In other words, while there were exceptions, standards typically employed a process requirement (e.g., procedures to safely handle chemicals) rather than a performance requirement (e.g., X % of chemical in on-site surface waters).

## 4.4 Important Water-related Areas

Reasonably well covered (3.0 – 1.5)	Poorly covered (1.4 – 1.0)	Very poorly covered (0.9 – 0.0)
Management of water-related habitat areas (2.3)	Management of water-related socio-cultural areas (1.3)	Aquatic invasive species (0.9)
Water-related land cover conversion & restoration (2.2)	Ecosystem services (1.1)	
Rare, threatened & endangered freshwater species (1.6)		

Table 9:  
Coverage of important  
water-related area issues

Overall, important water-related areas tended to be covered by broader requirements on biodiversity and habitats.

### Reasonably well covered

Virtually all of the standards assessed had coverage on the management of water-related habitat areas. Most standards contained specific measures to maintain water-related habitat areas (wetlands and riparian buffer areas being particularly prevalent); to identify and protect endangered species and their habitats within the producer's own boundaries; and to consider the implications of land cover change for water-related biodiversity. Particularly notable for their strengths were AWS, ProTerra, RSB, RSPO, RTRS, SAN, SAI Water Management/Water Stewardship, SRP and UTZ.

"Land use conversion" was also quite commonly noted in standard systems and was presumed to cover both terrestrial and aquatic land use conversion (the most common occurrence of which is the filling in of wetlands). Despite the relatively strong scores on land cover conversion, it is notable that virtually no standards (ProTerra being the notable exception) explicitly addressed conversion of aquatic "land" use (e.g., wetlands). Rather, many of the standard systems referenced and explicitly required use of the High Conservation Value (HCV) approach, as outlined by the HCV Resource Network (see Box 5), which under HCV4, does contain an explicit water reference as it pertains to ecosystem services.

### Poorly covered

Conversely, only about half of the standards assessed explicitly consider water-related cultural areas. While no systems scored a "3", in some ways this may be an artefact of the assessment process, as the decision was taken that only *explicit* requirements would be scored as a '3'. Several standards included more general requirements for social impact assessment, identification and protection of 'High Conservation Values' (which include cultural considerations under HCV5 and HCV6), consultations with stakeholders, and such measures may result in the identification, recognition and protection of water-related cultural areas in practice. Of particular note was SRP, which requires producers to "Involve women in the identification and propagation of edible or medicinal aquatic plants in the farm." – a particularly progressive practice given the often disproportionate level of interaction that women in developing nations have with water resources.<sup>30</sup>

A similar issue comes up with ecosystem services that are a part of HCV4, but would be well served to be explicitly called out, given the critical value that freshwater ecosystem services provide to agricultural production and food security.<sup>31</sup> Indeed along these lines, in light of recent input<sup>32</sup>, the HCV Resource Network (HCVRN) has begun to incorporate more explicit freshwater considerations into

## High Conservation Value Areas

High Conservation Values (HCVAs) are the areas containing biological, ecological, social or cultural values which are considered outstandingly significant or critically important, at the national, regional or global level.

HCV 1: Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.  
*E.g. the presence of several globally threatened bird species.*

HCV 2: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.  
*E.g. a large tract of Mesoamerican flooded grasslands and gallery forests with healthy populations of Hyacinth Macaw, Jaguar, Maned Wolf, and Giant Otter, as well as most smaller species.*

HCV 3: Rare, threatened, or endangered ecosystems, habitats or refugia.  
*E.g. patches of a regionally rare type of freshwater swamp.*

HCV 4: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.  
*E.g. forest on steep slopes with avalanche risk above a town.*

HCV 5: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc...), identified through engagement with these communities or indigenous peoples.  
*E.g. key hunting areas for communities living at subsistence level.*

HCV 6: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.  
*E.g. sacred burial grounds within a forest management area or new agricultural production.*

Source: Source: HCV Resource Network <https://www.hcvnetwork.org>

the HCV approach which merit further attention as the HCVRN formalises and licenses evaluators.<sup>33</sup> However, it will be important for production sites to make the shift from managing *on-site* HCVs (and related socio-cultural areas and ecosystem services) to collectively stewarding (i.e., governing) *off-site* HCVs upon which the site has reliance (or from which the site derives forms of water risk).

Issues related to invasive species were often not considered, with only about 30 % of the standards touching upon this issue (e.g., Fairtrade, ProTerra, RSB, RSPO, RTRS, SAI – Arable Crops, and SRP). When they were considered, the focus was almost always on preventing the introduction of new invasive species, with little focus on any actions to manage or eliminate invasive species that had been introduced previously (ProTerra being notable in its broader coverage). Furthermore, in no cases were aquatic invasive species explicitly called out, which is of particular concern given the impact of invasive species on aquatic biodiversity and the economy (an estimated \$120 billion dollars per year for the USA alone and constituting the primary risk to about 42 % of the listed Threatened or Endangered Species in the USA).<sup>34</sup>

Issues related to  
invasive species  
were often not  
considered.

## 4.5 General Recommendations from the Assessment

Based on the assessment, several broad recommendations emerge. While the following recommendations are intended for the standards community as a whole

and are worth considering for all 24 standards in this study, specific standards have been noted where it may be of particular benefit for the standard to review their requirements in that given area (denoted beside the “**NB**”). In general, however, the recommendations are intended to encourage a water stewardship dialogue between and within standard systems.

#### 4.5.1 Recommendations to the Standards Community on Water Governance:

More comprehensive approaches to assessing water risks would also help to ensure growers are aware of potentially large and costly water-related impacts.

- 1) **Improve references and guidance on respecting human rights to include the human right to water & sanitation.** It is our belief that providing comprehensive access to safe drinking water, adequate sanitation and hygiene awareness (WASH) should be an explicit requirement in all standards given that it is a human right. Explicit public leadership and policy commitments, such as the pledge put forth by the World Business Council for Sustainable Development (WBCSD)<sup>35</sup>, provide a good template for a pathway forward on WASH. Furthermore, recent publications<sup>36</sup> on respecting the human right to water and sanitation may help standard systems tailor requirements, guidance or training as appropriate. We recognise that this may take some time to implement in all systems, but given its nature, it is a logical and realistic goal to strive for in all systems. **NB:** *ASC, Bioland, CmiA, GRSB.*
- 2) Gradually **strengthen standards’ requirements to consider current water risks and anticipated future catchment context** (including climate and development changes) and to develop appropriate **resiliency measures**. More comprehensive approaches to assessing water risks (possibly linked to existing requirements on impact assessments), as outlined by WWF<sup>37</sup>, would also help to ensure growers are aware of potentially large and costly water-related impacts. Failure to incorporate such requirements will leave growers at risk of impacts of extreme events, changes in demand, and other water-related issues that jeopardise not only their profitability but their entire operation. **NB:** *4C, ASC, BCI, Bioland, Bonsucro, CmiA, Fairtrade, GRSB, IFOAM, ISO 14046, GRSB, Naturland, ProTerra, RTRS.*
- 3) Gradually **strengthen standards’ requirements to engage in public policy measures** and to participate in **shared natural resource governance** structures (such as catchment governance constructs like integrated water resource management). While engagement in governance mechanisms is not the current norm, we believe that the ongoing, cumulative, and shared challenges facing growers leads inevitably to a shared response. Furthermore, it is not realistic to expect that any given grower will bear the costs of a shared response; rather, by distributing the effort amongst many hands, it makes for lighter work, and lower costs for all affected parties. Positive participation in public sector agency activities, and other forms of shared governance, are going to be increasingly important for standards to embrace in order to maintain operations in catchments facing high water risks. **NB:** *All*

#### 4.5.2 Recommendations to the Standards Community on Water Balance

- 1) **Develop common guidance (and/or tools), based upon robust hydrological science, on how to determine “water scarcity” in local catchments and how to determine “contributions”,** so that terms such

as “not contributing to water scarcity” are meaningful and relevant in relation to availability and environmental flows.<sup>38</sup> Such efforts should be undertaken in collaboration with the broader water community and coordinated with efforts in ISEAL to continually improve both the monitoring, evaluation and effectiveness of standard systems. AWS could play a key role in this regard. Similarly, IFOAM and the SAI Platform could provide similar roles for their respective communities of practice. **NB:** *All*

- 2) Gradually **strengthen standards’ requirements, in water-scarce catchments, regarding the need to explicitly manage (measure and take action on) water efficiency.** Broad requirements to improve water efficiency (i.e., regardless of catchment context) is not pragmatic, nor cost-effective, since it requires those in areas with sufficient water availability to needlessly undertake greater costs. Such time, effort and money is typically better spent on other issues rather than saving a few more drops in an area without scarcity challenges. Instead, there is the need for greater nuance, based on context. Requirements to first understand catchment availability, and if scarce, then measure water withdrawals and consumption, is a much more sophisticated approach to tackling water efficiency requirements. Furthermore, if common catchment availability metrics were readily available and agreed upon by standards, the costs of implementation and auditing would decrease. Again, such efforts should be jointly undertaken through collaboration with the wider water and agricultural (irrigation) community (e.g., International Water Management Institute). **NB:** *All*

#### 4.5.3 Recommendations to the Standards Community on Water Quality:

- 1) Develop common guidance (and/or tools), based upon robust hydrological science, on how to determine “water quality stress” in local catchments and how to determine “contributions”, so that terms such as “not contributing to poor water quality” are meaningful and relevant in relation to environmental water quality and assimilative capacity. This is a parallel recommendation to point one under Section 4.5.2 with again the need to work with, and draw from, the broader water community. **NB:** *All*
- 2) Gradually **strengthen standards’ requirements, in water quality stressed locations, the need to explicitly measure the effectiveness of water pollution management.** Building off of the existing requirements, it will be important to not only manage water quality, but to measure both effluent water quality as well as environmental water quality to determine effectiveness (not just pollution management). As noted elsewhere, collaboration with others, and facilitated by entities such as ISEAL, IFOAM and the SAI Platform could prove to be useful coordinating bodies. **NB:** *All*

#### 4.5.4 Recommendations to the Standards Community on Important Water-Related Areas:

- 1) Gradually **strengthen standards’ requirements to have an explicit requirement to manage important socio-cultural areas (parallel to the environmentally important water-related areas).** With most standards already addressing environmentally important areas, the addition of

socio-cultural areas is a logical parallel. Use of the HCV approach (as advocated by the HCVRN) is an effective method of insuring consideration of both water-related environmental and socio-cultural areas of importance. **NB:** 4C, BCI, Bioland, CmiA, GLOBALG.A.P., GRSB, IFOAM, Naturland, RSB, SAI, SRP.

- 2) Gradually **strengthen standards' requirements to have an explicit requirement to collectively take action to safeguard critical freshwater ecosystem services to mitigate water risks.** While many standards currently have requirements for managing on-site ecosystem services (via HCV4 requirements), standards must begin to consider efforts to work “beyond the fenceline” of operations to mitigate shared issues that contribute to their water risks. Working collectively to obtain communal catchment data/maps of freshwater ecosystem services would again serve to lower costs for all parties from standard users to auditors to lower costs. The Natural Capital Project, Forest Trends (Katoomba & Ecosystem Marketplace) and other ecosystem service organisations may be useful potential partners in such endeavours. **NB:** *All*
- 3) Gradually **strengthen standards' requirements to have an explicit requirement to address invasive species (calling particular attention to aquatic invasive species).** These requirements ought to cover both mitigation (i.e., non-introduction) and also adaptation, including removal and restoration, bearing in mind the cost realities facing production sites. **NB:** *4C, ASC, AWS, BCI, Bioland, Bonsucro, CmiA, IFOAM, GLOBALG.A.P., GRSB, Naturland, SAI – Water Management/Stewardship, SAN, UTZ*
- 4) Strengthen efforts to coordinate and align **with the High Conservation Value Resource Network to ensure consistent and freshwater-relevant approaches to HCV assessment** both inside and outside the production site. **NB:** *Standards that reference HCV - AWS, Bonsucro, Fairtrade, GRSB, ProTerra, RSPO, RTRS.*

These recommendations broadly apply across standard systems, but there is recognition that there is considerable variability between standards. Many standards are modified through an official, multi-stakeholder review period. This window allows for public or member-based input, which is then reviewed by the standard system owners/members and incorporated (or rejected). Standards may therefore wish to employ such recommendations during these official review periods. WWF also encourages bilateral dialogue with any of the standard systems in this study in order to explore specific assessment results in more detail.

Please **NOTE** that the feedback provided in this report may be employed as an input for future review periods, but does not constitute official WWF input into such a review.

However, recognising that modifying a standard is a lengthy and time-consuming exercise, the following section explores two other approaches to enable standards to strengthen their coverage of water stewardship.

## 5 Strengthening Standards through Tailored Approaches to Water Stewardship

From the outset of this study, it has repeatedly been emphasised that water varies through space, time and in importance to any given commodity. Just as water is variable, so too must the solutions be flexible to accommodate varying circumstances. A “one-size-fits-all” solution is not appropriate nor recommended.

Section 5 explores two flexible approaches to incorporating more rigour on water stewardship without necessarily making modifications to the requirements written into a standard:

- 1) Developing supplementary guidance documents on water stewardship
- 2) Developing collaborative approaches with other standards to address gap areas

In addition, Section 5.3 explores the use of water risk mapping to further tailor the two approaches.

### 5.1 Exploring the Role of Supplementary Water Stewardship Guidance in Standards

Water stewardship need not necessarily be addressed through more rigorous principles, criteria and indicators. The reason is that water stewardship offers a very self-serving motivation to growers to help mitigate their water risks. However, in pursuing a water stewardship approach, it also provides benefits to other water users in the catchment, both human and other species.

One approach that several standard systems have employed is to develop supplementary water guidance documents.<sup>39</sup> For the purposes of this study, the SAI platform was used as a case study since it offers not only a water management add-on (“Principles and Practices for the Sustainable Water Management in Farming Production – Version 2010”), but also an additional guidance document on water stewardship as well (“Water Stewardship in Sustainable Agriculture: Beyond the Farm Towards a Catchment Approach”).

These two supplementary guidance documents were assessed to understand how they could effectively improve the score of the more traditional crop standard (“Principles and Practices for the Sustainable Production of Arable & Vegetable Crops – Version 2009”). The results are presented in Table 10 (page 48) with green indicating an improvement over the baseline SAI Arable Crops requirements.

#### 5.1.1 Summary of the Assessment Results of Supplementary Guidance for Standards

The results from Table 10 highlight several interesting results. Firstly, one can see that when assessed individually, each of the different documents (the two “standards” and the water stewardship guidance) score quite similarly (within 9 points of one another) with an average of 48 (52, 43 and 49 respectively). However, when all three are combined, they jump up an average of 19 points to 67, or put differently, the use of supplementary guidance documents generates an increase in coverage of roughly 40%.

Table 10:  
Summary of the effect  
of supplementary  
water-specific guidance  
on assessed scores

	14. SAI - Arable Crops	14A. SAI – Sus- tainable Water Management	14B. SAI - Water Stewardship	14C. P&Ps Combined (14 + 14A)	14D. All Combined (14 + 14A + 14B)	Increase (All combined - SAI Arable Crops)
<b>1. Water Governance</b>						
Water as a priority area within the standard	3	3	3	3	3	0
Legal compliance	1	1	2	1	2	1
Water, sanitation & hygiene for staff	3	2	2	3	3	0
Adaptive water management plan/policy	1	3	0	3	3	2
Consideration of catchment context	2	2	3	2	3	1
Land and water rights	0	0	1	0	1	1
Environmental & social impact assessment	1	2	2	2	2	1
Transparency & stakeholder consultation	1	3	3	3	3	2
Dispute resolution	0	2	1	2	2	2
Water risk assessment	3	3	3	3	3	0
Catchment-level collaboration / collective action	2	1	3	2	3	1
Indirect water use & supply chain engagement	2	0	0	2	2	0
Future scenario & resilience planning	0	3	3	3	3	3
Participation in catchment governance & policy	0	0	0	0	0	0
Formal leadership commitment on water	0	0	3	0	3	3
	<b>1.3</b>	<b>1.7</b>	<b>1.9</b>	<b>1.9</b>	<b>2.4</b>	<b>1.1</b>
<b>2. Water Balance</b>						
Water use efficiency	3	3	3	3	3	0
Quantitative water use information	2	3	3	3	3	1
Absolute water quantity limitations	2	0	1	2	2	0
	<b>2.3</b>	<b>2.0</b>	<b>2.3</b>	<b>2.7</b>	<b>2.7</b>	<b>0.3</b>
<b>3. Water Quality Status</b>						
Water effluent management	3	3	3	3	3	0
Qualitative water use information	3	3	3	3	3	0
Absolute water quality limitations	2	0	0	2	2	0
	<b>2.5</b>	<b>1.5</b>	<b>1.5</b>	<b>2.5</b>	<b>2.5</b>	<b>0.0</b>
<b>4. Important Water-related Areas</b>						
Management of water-related habitat areas	2	3	3	3	3	1
Water-related land cover conversion & restoration	0	0	0	0	0	0
Rare, threatened & endangered freshwater species.	2	0	0	2	2	0
Management of water-related socio-cultural areas	0	0	0	0	0	0
Ecosystem services	0	0	1	0	1	1
Aquatic invasive species	2	0	0	2	2	0
	<b>1.0</b>	<b>0.5</b>	<b>0.7</b>	<b>1.2</b>	<b>1.3</b>	<b>0.3</b>
<b>1. Water Governance</b>						
	42	56	64	64	80	38
<b>2. Water Balance</b>						
	78	67	78	89	89	11
<b>3. Water Quality Status</b>						
	89	67	67	89	89	0
<b>4. Important Water-related Areas</b>						
	33	17	22	39	44	11
<b>Averages</b>	<b>61</b>	<b>51</b>	<b>58</b>	<b>70</b>	<b>76</b>	

Secondly, it is interesting to see where each of the documents have greater or lesser coverage. The original SAI Arable Crop standard has the strongest requirements in three of the four areas (all but water governance), while the water stewardship guidance document has the greatest coverage of water governance. However, since they cover different gaps, they are synergistic and result in a greater score than each achieve individually. Even the water management document fills some gaps that the water stewardship and arable crop documents leave unaddressed (e.g., a strong set of requirements on an adaptive water management plan).

### 5.1.2 How Customised Guidance Can Help to Address Water Stewardship for Standard Systems

Such guidance documents are incredibly flexible, and as SAI demonstrates, need not even be limited to one. Guidance documents may be developed ‘out of synch’ with official standard revisions and also form the basis for testing potential requirements that could be added into the standard through time. Indeed, guidance may be (A) be included into any official guidance that accompanies the standard, (B) be included in a separate, supplementary guidance document on water (as is the case with SAI), or (C) be included informally via other mechanisms, such as training. Indeed, some standard systems, such as BCI, place a strong emphasis on training and learning to encourage improvements through knowledge sharing. Especially for such systems, and systems that can ill-afford to add additional auditing burdens on small-holder growers (but who are also highly at risk from water risks), such training using practical guidance documents could prove to be highly effective.

Furthermore, such guidance can also be tailored for specific geographies and issues via national interpretations. This is particularly important where water risks are high (see Section 5.3). In many of these regions, standard systems may also be able to draw from established, practical, field-tested guidance. Indeed, WWF has assisted in the development of many such resources over the past decade (see Box 6).

For all of these reasons, and no matter what the current water requirements of a given system are, we encourage all systems exposed to water risks to begin to draw upon



#### Developing practical water stewardship guidance for farmers in South Africa

In 2014, WWF, in combination with Marks & Spencer, the Alliance for Water Stewardship and Woolworths South Africa began working with stone fruit farmers in Ceres, South Africa. The project employed the new AWS standard to evaluate water stewardship efforts, and is using the experience and lessons learned to publish guidelines to help others in the Western Cape become good water stewards. These guidelines, once complete, will form yet another mechanism to help the local farmers (many of whom already employ standards such as GLOBAL G.A.P., to further enhance their water stewardship efforts. *Video-Link: <https://www.youtube.com/watch?v=cVGjkpLb1Ss>*

## 5.2 Exploring the Role of Standard System Collaboration to Enhance Water Stewardship

If a more formal, credible approach is desired or required, another flexible mechanism is collaboration. Standards have a long history of collaboration and indeed, such collaborations have spawned numerous efforts such as IFOAM and ISEAL, which have in turn developed common approaches and further encouraged alignment between systems. Mutual recognition of another standards requirements is a well-established and practical method of reducing duplication, and enhancing harmonisation between systems.

### 5.2.1 The Case of Employing Complementary Water-specific Standards to Enhance Water Stewardship

In recent years, commensurate with the growing recognition of the importance of water, a number of new water-specific standards has emerged. Most notably within this landscape has been the Alliance for Water Stewardship standard, a thematically-focussed standard with an explicit mandate to address water stewardship issues. In addition, several efforts on “water footprinting” have emerged, including the Water Footprint wNetwork’s approach and more recently, ISO, with the release of ISO 14046, which has provided another water-specific standard designed to address the need for life cycle assessments (LCA) for water.

Water specific  
guidance can  
boost standard  
water-performance  
significantly.

Recognising that AWS formed a large part of the basis for the Framework and therefore should logically score well against it, AWS and ISO 14046 were scored using the Framework with the results provided in Table 11. This was undertaken to understand how these two respective standards may be able to complement other standards and work jointly to cover water stewardship issues more comprehensively.

Table 11 indicates how a water-specific standard, such as AWS can be employed to “plug gaps” in other standards. This is particularly true for the water governance elements, where in the four standards used for illustrative purposes, AWS provided an average increase in coverage 50 % (with a large range: 20 % to 213 % increase) with the greatest impact on strengthening water governance elements.

Such collaboration is not something to be undertaken lightly, nor is it a logical pathway in many cases. These sorts of efforts not only require formal agreements between the standard systems, but a considerable degree of coordination (e.g., cross training, alignment of timelines, etc.) with certification bodies as well. Rather such joint efforts should be used judiciously and focussed on commodities where consumers are requesting such efforts on water and/or commodities facing significant water risks. The example in Box 6 above, highlights one such case where if a company such as Marks and Spencer identified their water risks and wished to address such risk. AWS, in combination with their normal GLOBAL G.A.P. requirements, allowed M&S to verify the extent to which their supply chain is implementing efforts to mitigate water risks, while still maintaining their base agricultural certification requirements.

Furthermore, AWS, which also offers water stewardship training, could also be employed to help build guidance or deliver joint training, which might be a particularly effective solution for standards with a heavy focus on capacity building (e.g., BCI), or whose systems are currently lack a certification system (e.g., SAI, GRSB, SRP).

Table 11:  
Summary of the effect  
of complementary  
water-specific standards  
on assessed scores

	A1. ISO 14046	A2. AWS	BCI + AWS	Bonsucro + AWS	GLOBALG.A.P. + AWS	RSB + AWS	SRP + AWS
<b>1. Water Governance</b>							
Water as a priority area within the standard	3	3	3	3	3	3	3
Water, sanitation & hygiene for staff	0	3	3	3	3	3	3
Legal compliance	0	3	3	3	3	3	3
Adaptive water management plan/policy	0	3	3	3	3	3	3
Consideration of catchment context	2	3	3	3	3	3	3
Land and water rights	0	3	3	3	3	3	3
Environmental & social impact assessment	2	1	1	2	1	3	1
Transparency & stakeholder consultation	1	3	3	3	3	3	3
Dispute resolution	0	1	1	3	1	3	1
Water risk assessment	0	3	3	3	3	3	3
Catchment-level collaboration / collective action	0	3	3	3	3	3	3
Indirect water use & supply chain engagement	3	3	3	3	3	3	3
Future scenario & resilience planning	0	3	3	3	3	3	3
Participation in catchment governance & policy	0	3	3	3	3	3	3
Formal leadership commitment on water	0	3	3	3	3	3	3
	<b>0,7</b>	<b>2,7</b>	<b>2,7</b>	<b>2,9</b>	<b>2,7</b>	<b>3,0</b>	<b>2,7</b>
<b>2. Water Balance</b>							
Water use efficiency	0	3	3	3	3	3	3
Quantitative water use information	3	3	3	3	3	3	3
Absolute water quantity limitations	0	1	1	1	1	2	2
	<b>1,0</b>	<b>2,3</b>	<b>2,3</b>	<b>2,3</b>	<b>2,3</b>	<b>2,7</b>	<b>2,7</b>
<b>3. Water Quality Status</b>							
Water effluent management	0	3	3	3	3	3	3
Qualitative water use information	3	3	3	3	3	3	3
Absolute water quality limitations	0	1	1	2	2	2	2
	<b>1,0</b>	<b>2,3</b>	<b>2,3</b>	<b>2,7</b>	<b>2,5</b>	<b>2,7</b>	<b>2,7</b>
<b>4. Important Water-related Areas</b>							
Management of water-related habitat areas	1	3	3	3	3	3	3
Water-related land cover conversion & restoration	0	0	0	2	2	3	2
Rare, threatened & endangered freshwater species	0	2	2	2	2	2	2
Management of water-related socio-cultural areas	0	3	3	3	3	3	3
Ecosystem services	0	3	3	3	3	3	3
Aquatic invasive species	0	1	1	1	1	2	2
	<b>0,2</b>	<b>2,0</b>	<b>2,0</b>	<b>2,3</b>	<b>2,3</b>	<b>2,7</b>	<b>2,5</b>
<b>1. Water Governance</b>	24	91	91	98	91	100	91
<b>2. Water Balance</b>	33	78	78	78	78	89	89
<b>3. Water Quality Status</b>	33	78	78	89	89	89	89
<b>4. Important Water-related Areas</b>	6	67	67	78	78	89	83
<b>Averages</b>	<b>24</b>	<b>78</b>	<b>78</b>	<b>86</b>	<b>84</b>	<b>92</b>	<b>88</b>
<b>Percentage increase through collab. with AWS</b>			213 %	51 %	32 %	20 %	29 %

Similar to AWS, WFN and ISO 14046 can be a useful mechanisms for sites where indirect water use is particularly important. This may be the case where an understanding the water use associated with feed is of concern. Furthermore, water footprinting may have a role to play in also addressing water throughout the value chain in CoC certifications if water were to be covered in scope.

### 5.2.2 Exploring the Case of Employing Supplementary Organic Standards to Enhance Water Stewardship

In some cases, standards, such as those linked to organic, have opted to go above and beyond a common standard, and “add on” or supplement. Europe offers an interesting case study in this regard given the long standing supplementary organic standards that exist which go above and beyond the regulated requirements for organic.

Similar to 5.2.1, two additional European organic standards (Bioland and Naturland) were scored using the Framework with the results provided in Table 12. This was undertaken to understand how these supplementary standards may be able to build on existing standards to cover water stewardship issues more comprehensively.

The results of the assessment suggested that while there are some gains, notably under the Naturland standard on water governance and important water-related areas, in general, there is minimal additional coverage gained through the use of a supplementary standard over and above the IFOAM standard norms. It should also be noted that Naturland is presently exploring additional water stewardship elements, which would likely alter the results of this assessment. That is not to say that in the future such supplementary standards may not be able to play a key role to improve water stewardship coverage. Indeed, especially where national interpretations play a key role (e.g., IFOAM), for countries (and regions) facing significant water risks (e.g., Pakistan, India, etc.), more stringent water stewardship coverage through such supplementary standards may be a logical pathway in addressing water risks for commodities of concern.

The results of the assessment suggested that while there are some gains, (...) there is minimal additional coverage gained through the use of a supplementary standard over and above the IFOAM standard norms.

## 5.3 Exploring Commodity Water Risk Maps and Developing Tailored Solutions

From the outset of this study, it has been stressed that considering the circumstances and water risks facing a given agricultural commodity is critical to inform a suitable water stewardship response. To help guide standards on which of the above stewardship pathways are worth pursuing, it makes sense to explore which commodities face water risks and therefore may be most interested in developing robust water stewardship approaches. The following section explores how water risk data, when combined with commodity production information, can help guide which of the pathways to pursue, and which stewardship elements to consider strengthening.

Table 12:  
Summary of the effect  
f supplementary  
organic standards on  
assessed scores

	9. IFOAM	B2. Bioland	B3. Naturland
<b>1. Water Governance</b>			
Water as a priority area within the standard	2	2	2
Water, sanitation & hygiene for staff	2	1	2
Legal compliance	1	2	1
Adaptive water management plan/policy	0	0	2
Consideration of catchment context	1	1	2
Land and water rights	2	2	2
Environmental & social impact assessment	0	0	1
Transparency & stakeholder consultation	0	1	0
Dispute resolution	0	0	0
Water risk assessment	1	0	0
Catchment-level collaboration / collective action	0	0	1
Indirect water use & supply chain engagement	1	0	1
Future scenario & resilience planning	0	0	0
Participation in catchment governance & policy	0	0	0
Formal leadership commitment on water	0	0	0
	<b>0.7</b>	<b>0.6</b>	<b>0.9</b>
<b>2. Water Balance</b>			
Water use efficiency	2	2	2
Quantitative water use information	2	2	2
Absolute water quantity limitations	2	1	2
	<b>2.0</b>	<b>1.7</b>	<b>2.0</b>
<b>3. Water Quality Status</b>			
Water effluent management	2	2	2
Qualitative water use information	1	1	1
Absolute water quality limitations	2	1	2
	<b>1.5</b>	<b>1.0</b>	<b>1.5</b>
<b>4. Important Water-related Areas</b>			
Management of water-related habitat areas	2	2	2
Water-related land cover conversion & restoration	2	1	2
Rare, threatened & endangered freshwater species	1	0	1
Management of water-related socio-cultural areas	1	1	0
Ecosystem services	0	0	2
Aquatic invasive species	0	1	1
	<b>1.0</b>	<b>0.8</b>	<b>1.3</b>
<b>1. Water Governance</b>	22	20	31
<b>2. Water Balance</b>	67	56	67
<b>3. Water Quality Status</b>	56	44	56
<b>4. Important Water-related Areas</b>	33	28	44
<b>Averages</b>	<b>44</b>	<b>37</b>	<b>49</b>

### 5.3.1 Water Risk Data

The results from Section 4 outlined the gaps and coverage of water stewardship in the requirements of numerous standards. Stemming from these results, it is a reasonable but a broad generalisation to say that standards currently tend to focus on water management impacts to water quality, on ensuring water use efficiency, and protecting riparian and other on-property areas of biodiversity value. Equally safe to say is that the vast majority of standards do not account for how they are at risk from water issues. Furthermore, water risk occurs not only as a result of scarcity, but also because of overabundance (i.e., flood risk), and environmental water quality.

The first part of Section 5 highlighted two possible pathways: guidance and standards collaboration (be it complementary or supplementary). This final section pulls together water risk information to inform which pathway different commodity standards might want to consider.

#### The WWF Water Risk Filter

In 2010, WWF developed the Water Risk Filter, which allows sites to enter user information on water, along with locational information, to generate a customised risk assessment that accounts for the sector and catchment (see Box 7). This contextualisation of water allows for a prioritisation between sites, and also informs a prioritisation of issues within a site.

Such an approach to water risk is also of value to standard systems in how they incorporate water stewardship issues into their respective systems. The following risk maps, derived from the Water Risk Filter, cover eight key commodities (for additional methodology details, please refer to Section 3) and help to guide standards on where to focus their efforts on water stewardship. These commodities are: cattle, coffee, cotton, corn/maize, palm oil, rice, soy, and sugarcane.

Furthermore, each of these risk elements can be further broken down as illustrated here using coffee (which in general does not face a high global average physical water risk) into sub-area physical water risks, such as water scarcity, flooding and water pollution (Figure 8 A, B, C). Such nuanced water risk analyses, which are largely beyond the scope of this study, would enable an even more refined approach for the incorporation of water stewardship activities into regional requirements or guidance documents.



#### The WWF Water Risk Filter

The Water Risk Filter helps companies and investors ask the right questions about water. It allows users to assess physical, reputational and regulatory water risks, and offers guidance on what to do in response.

Users (e.g., retailers, growers, standard systems) can upload farm location data, select crop information and enter additional site water use information to develop customised water risk portfolios. Such analyses can greatly improve the understanding of water risks and, along with the included “mitigation toolbox”, help to tailor effective and efficient water risk mitigation strategies. *Link: <http://waterfilter.panda.org/>*

Fig: 7a  
Map of physical water  
risk by production areas

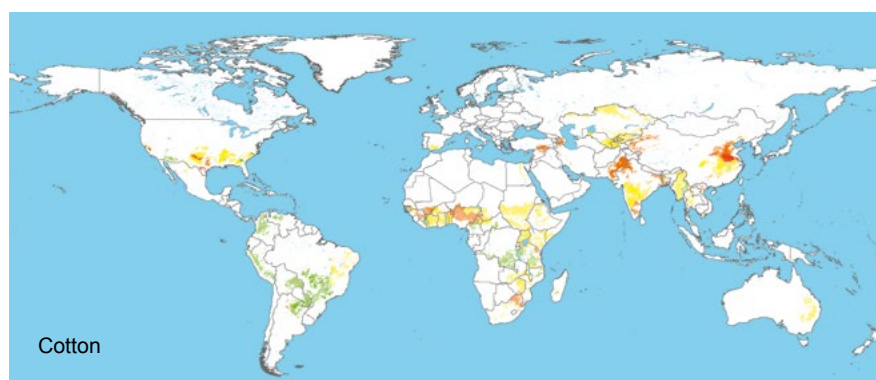
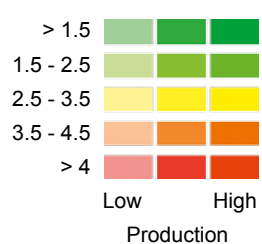
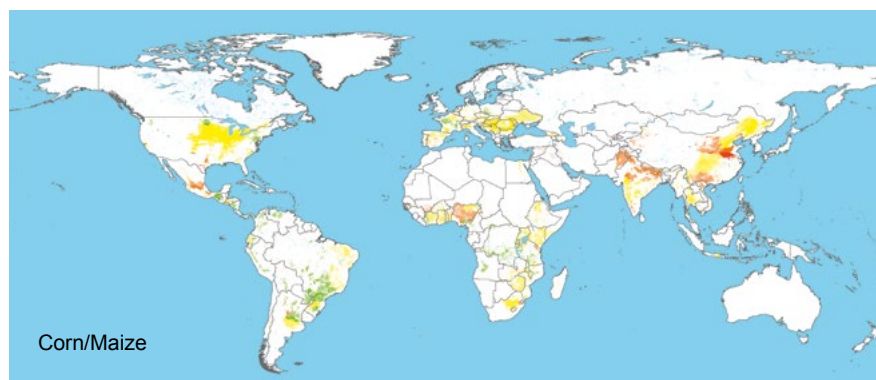
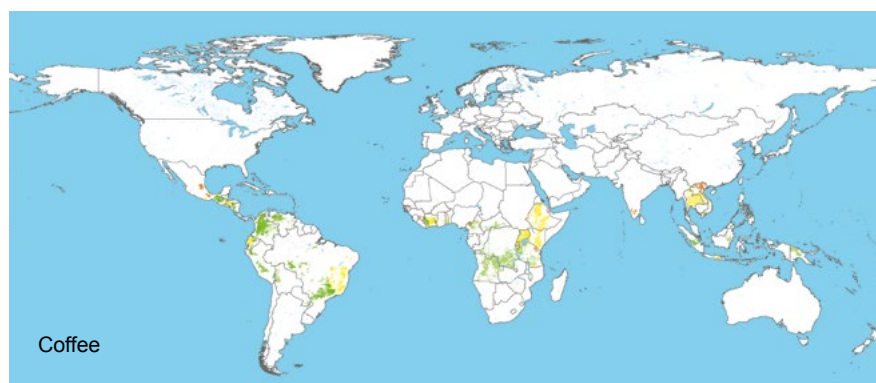
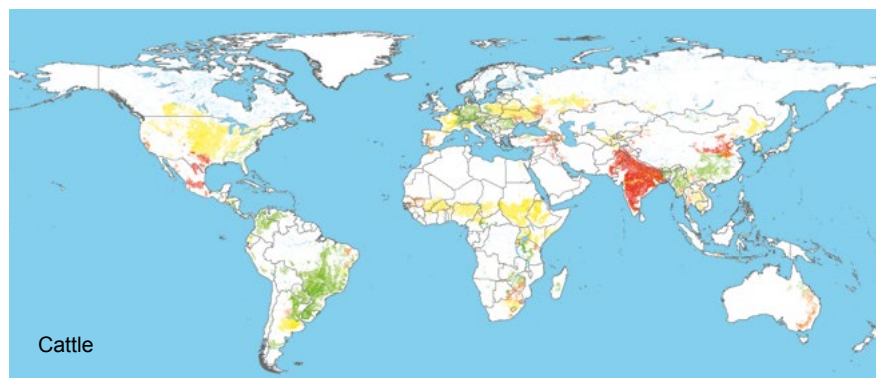
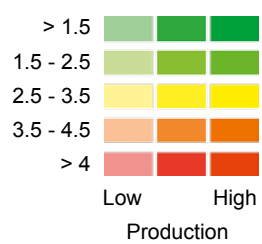
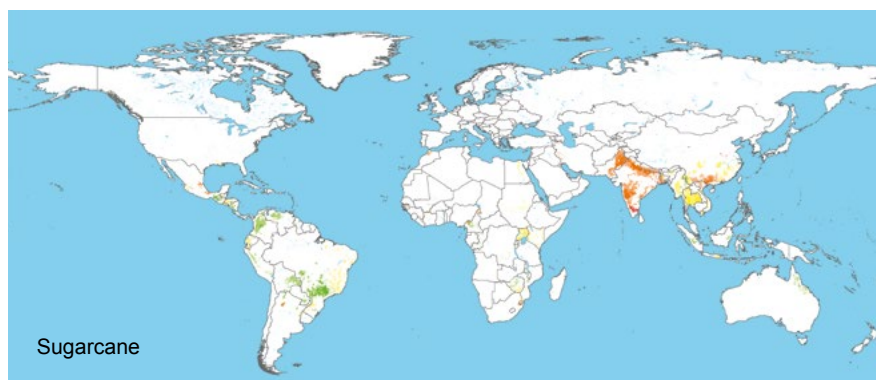
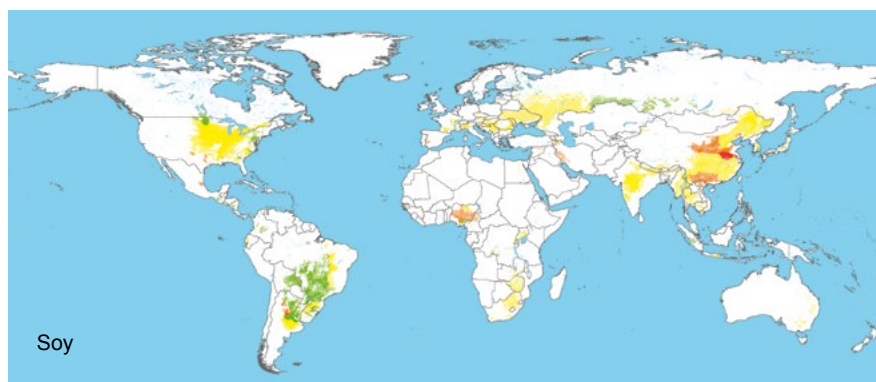
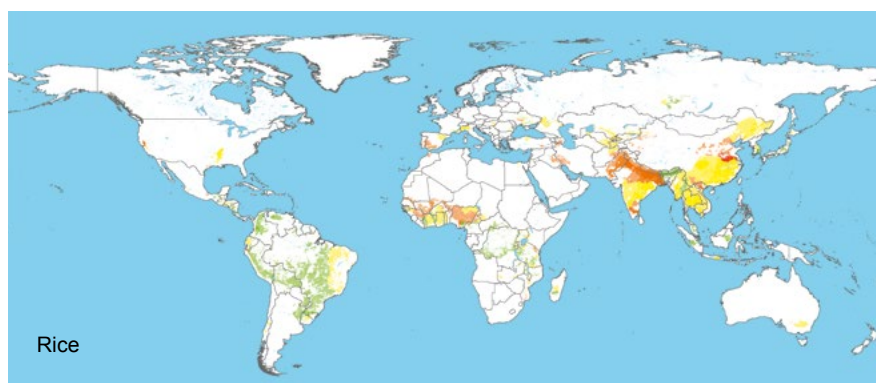
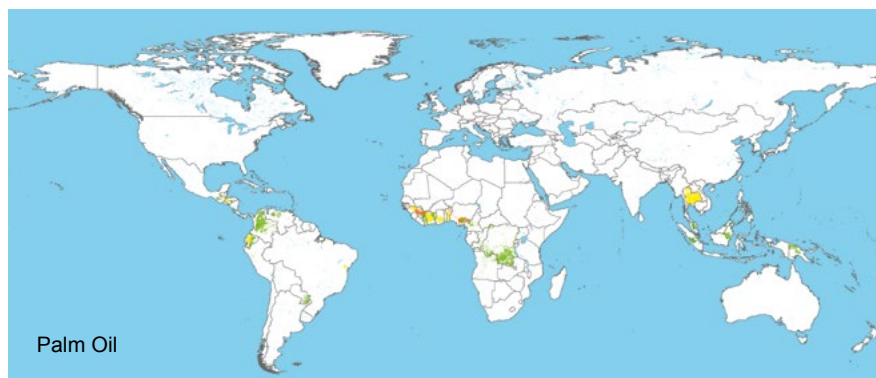


Fig: 7b  
Map of physical water  
risk by production areas



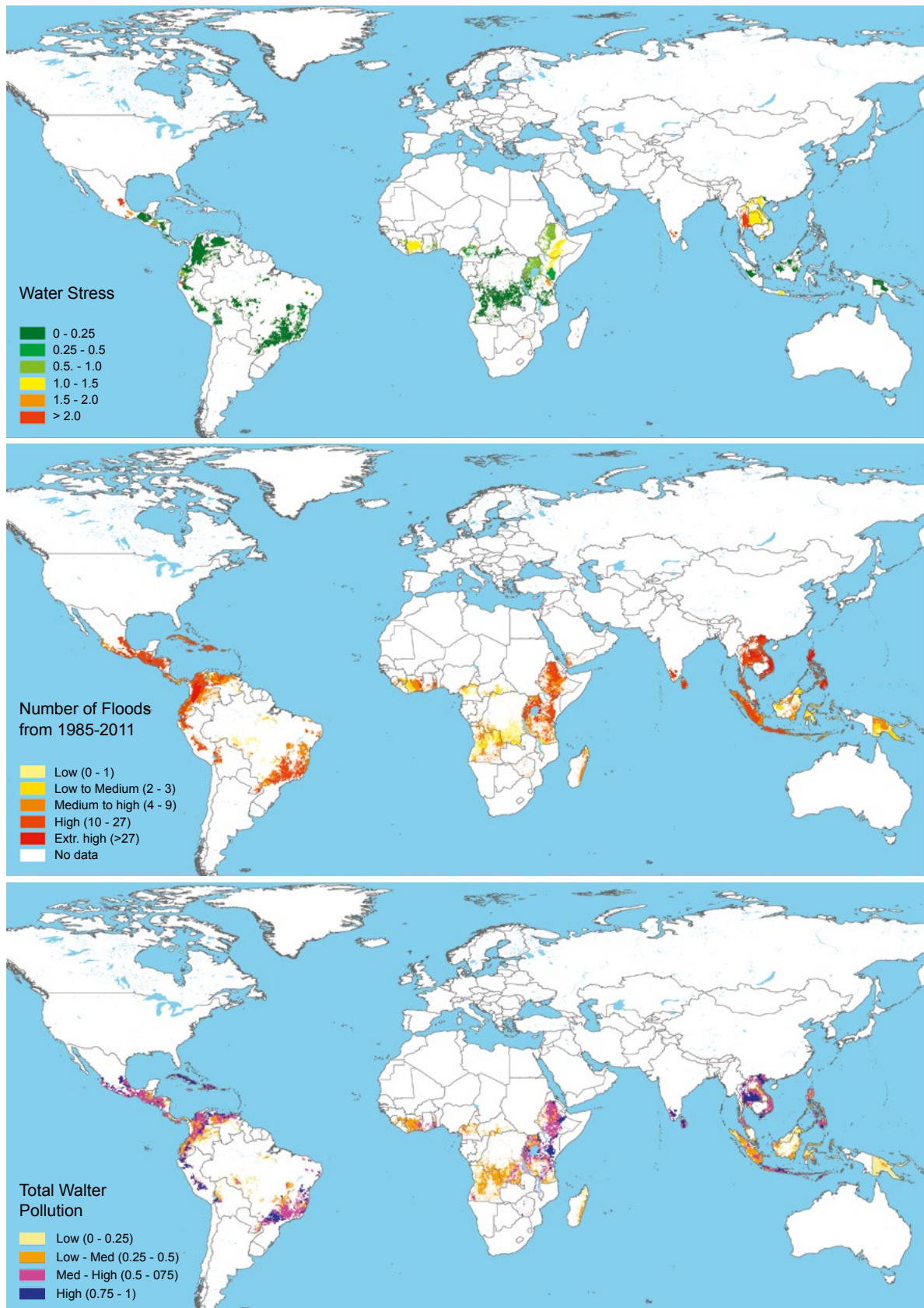


Figure 8 a,b,c: Detailed physical water risks by coffee growing areas

### 5.3.2 Harnessing Water Risk Data to Build Smarter Standard Systems

The above risk maps enable smarter, more nuanced approaches to how standards can incorporate water stewardship.

**Which water issues to focus on within your standard:** First, the maps provide us with details on which commodities face which types of water risks most acutely. While many standards have highly knowledgeable growers in their membership, inevitably everyone's knowledge is limited in time and space, and these sorts of maps help us to gain a better global understanding of where specific types of water risks matter – be they scarcity, flooding or pollution. Through an understanding of all of the kinds of water risks facing a standards users, the standard system can better prioritise which water issues to focus on. In other words, during revisions, if enough growing areas are facing increasing water scarcity risks, then water efficiency measures may be worth prioritising, whereas if growers are facing flood or water quality risks, then resiliency measures or water pollution management respectively may be worth exploring first.

**Where on the planet to focus your efforts within your standard system:**

Second, the maps provide us with a pathway for where, geographically speaking, guidance could be customised, or where training may be required (and for which water risks). Understanding that standard users in select places facing high physical water risks (such as northern India, the western cape of South Africa, northern China, northern Africa, eastern Java, etc.) may encourage systems to be more tailored in their approaches rather than attempting to develop a universal set of requirements on water. Using the coffee maps (Figures 7 and 8 A, B, C) as an example, we can relatively quickly determine that water stewardship efforts may want to focus on the following regions: southern Mexico (San Luis Potosi, Nayarit, Jalisco, Oaxaca), eastern Cote D'Ivoire, northern Ethiopia, East Java, northern Thailand, Northern Vietnam, southern India (Kerala). If we were targeting only water pollution issues, then we might also consider adding Cuba, Brazil (Sao Paulo/Parana), Peru (Cusco), Kenya, and Sri Lanka (Figure 8 C).

There is a strong overlap between some areas of cotton and soy, cotton and corn, sugarcane and coffee.

**Who to work with:** Third, in recent years there has been an evolution in the thinking of the business community from site management to a realisation that in order to mitigate water risks, one must engage in broader, catchment-based approaches that involve greater catchment awareness, collaboration, governance engagement and resilience. Mapping water risks and discussing overlaps with other commodities and standards can help to facilitate collective action between standard systems; after all, many hands makes for light work!

Even looking at the maps from this report, we can see that there is a strong overlap between some areas of cotton and soy (southern USA, central India, NW China, SE Australia), cotton and corn (E. South Africa, central India, Pakistan, NW China), sugarcane and coffee (e.g., Thailand, Laos, Mexico, S.India).

Platforms such as the United Nations CEO Water Mandate's Water Action Hub ([wateractionhub.org](http://wateractionhub.org)) may prove helpful to standard systems endeavouring to identify others interested in water stewardship projects.

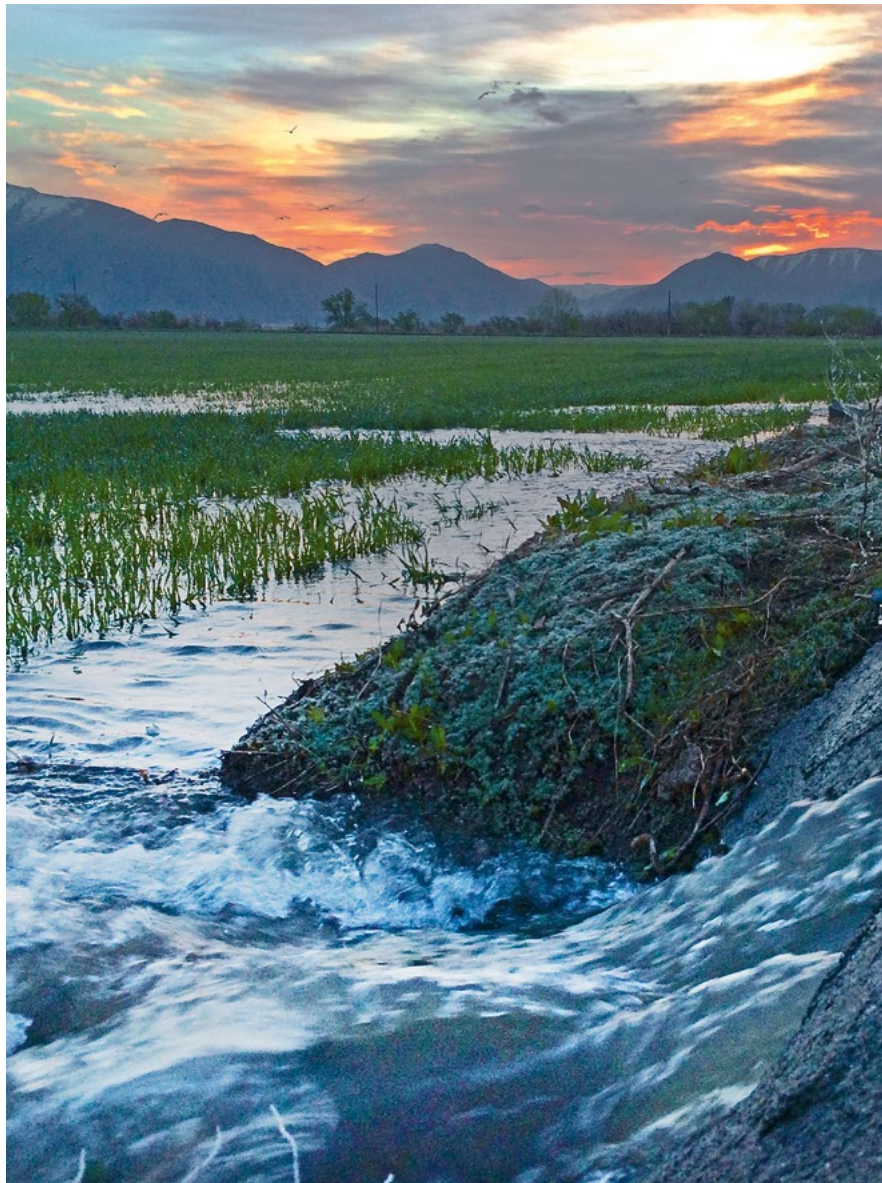
**Which proposed pathway to employ to enhance water stewardship:**

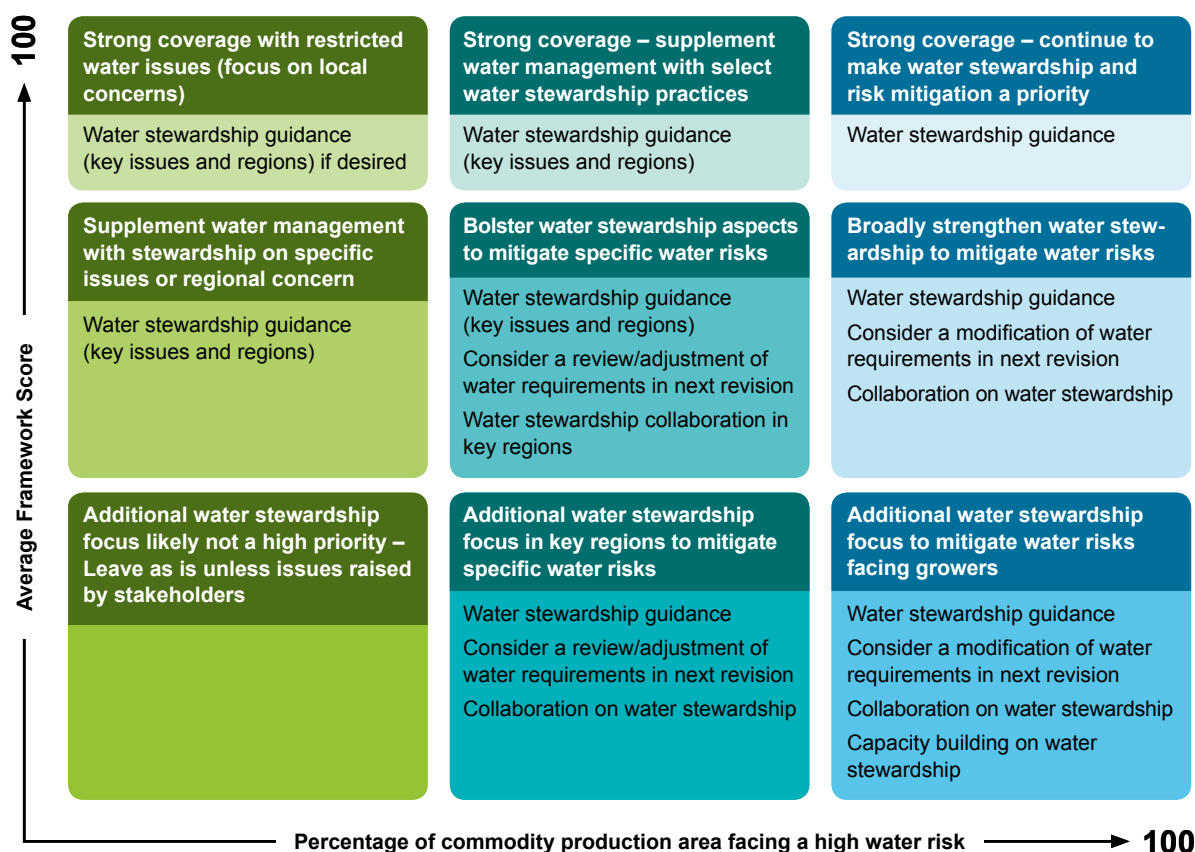
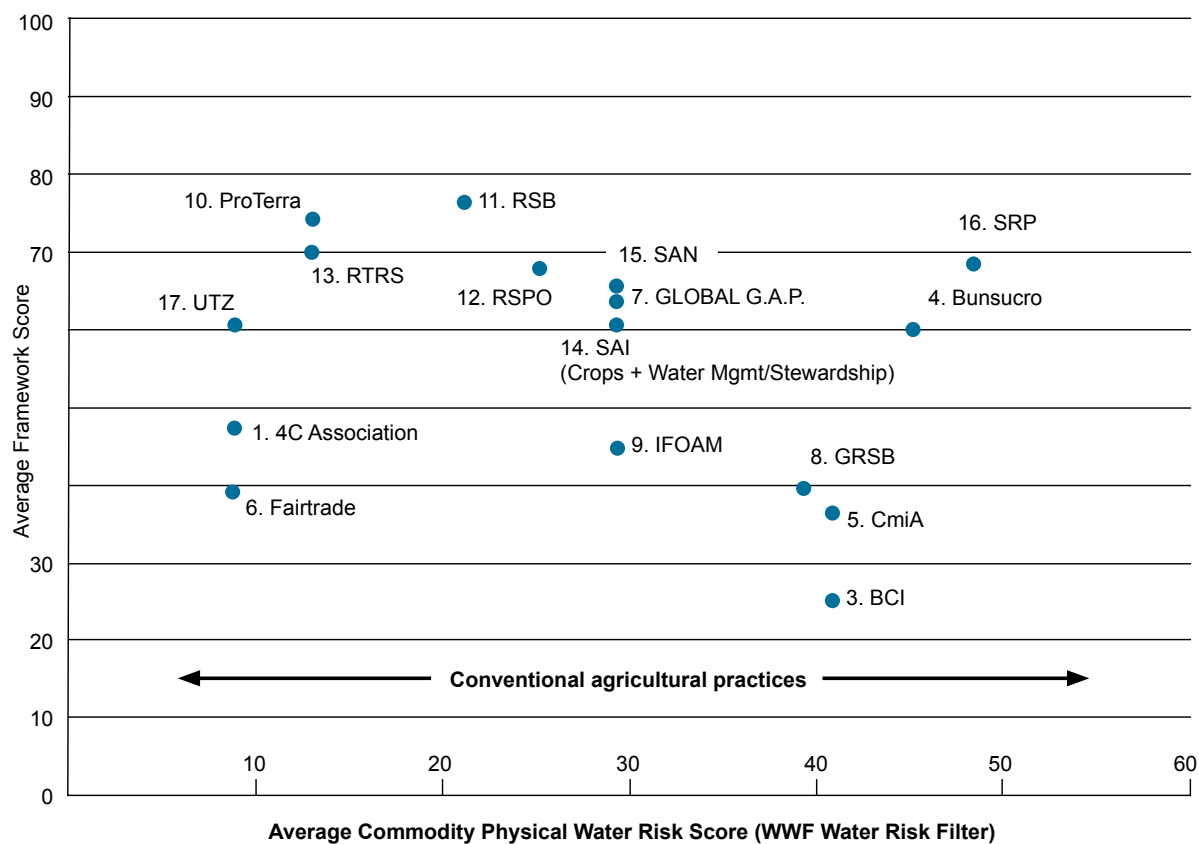
Fourth, we can employ the data to help guide suitable pathways. By taking physical water risk data and mapping the percentage of commodity production area

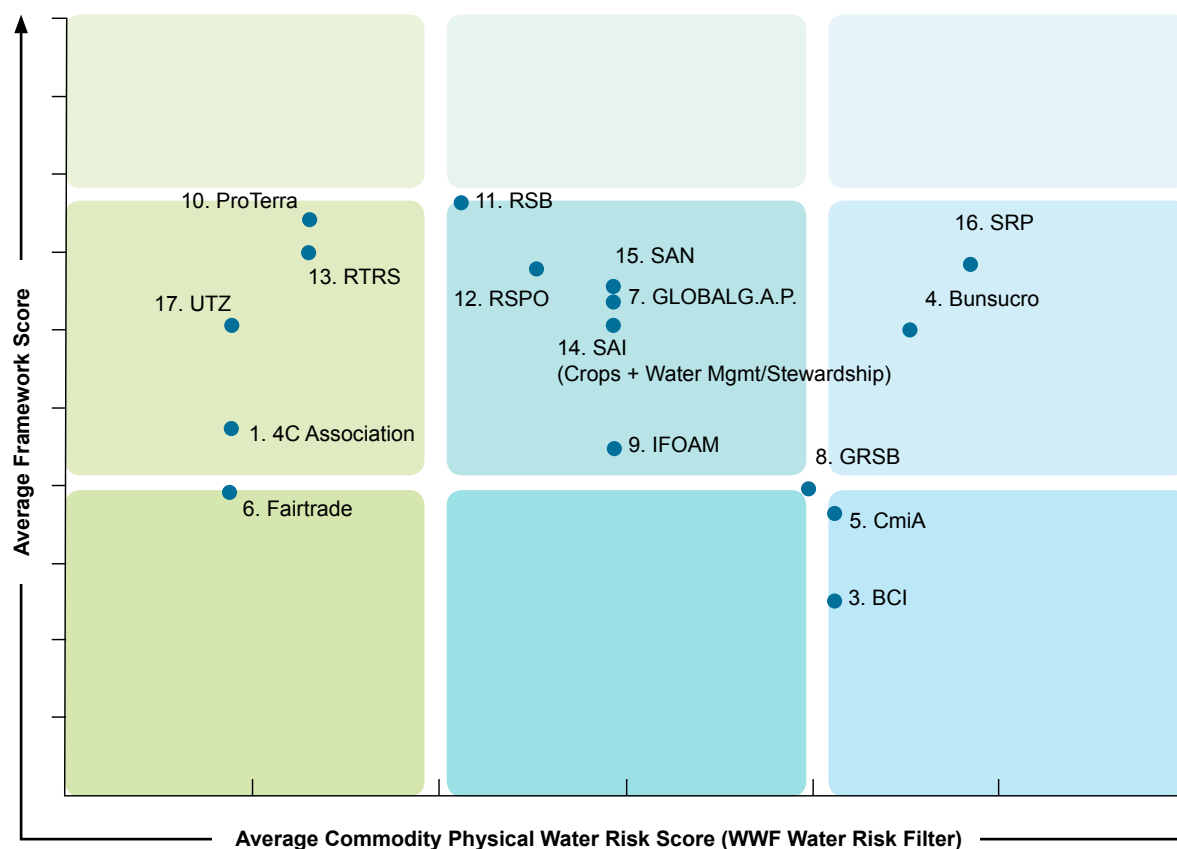
facing high or very high water risk (a score of  $>3.5$  within the Water Risk Filter), and map that against the average standard scores from the framework assessment, we get a broad picture of the different standards (Figure 9) and can then develop a generalised categorisation (Figure 10) and overlay this against the scores (Figure 11) to develop recommended water stewardship pathways (Table 13). Note that for the more general agricultural standards (GLOBALG.A.P., IFOAM, and SAI), an average water risk score of the eight commodities was employed, while other systems were scored largely using the primary product certified (e.g., cocoa for SAN). It is worth noting that the X-axis score would differ considerably based on the given commodity and does not address local water issues (for which more water risk evaluation is required, but was beyond the scope of this study).

These results provide a relatively simple set of suggestions, which are summarised in Table 13 (Note: ASC was removed since no suitable data were available for tilapia production)

Globally flood irrigation is still the predominant form of irrigation. This traditional irrigation technique also shows high evaporation rates.







FIGURES ON PAGE 60/61:

Figure 9: (top left)  
Catchment water scarcity  
for primary crops  
(here represented as  
corresponding standard  
system) against average  
water balance scores

Figure 10: (bottom left)  
Generalised categorisations  
for water stewardship  
pathways

Figure 11: (top right)  
Recommended water  
stewardship pathways  
for select agricultural  
sustainability standards

Table 13: (bottom right)  
Recommendations on  
water stewardship focus  
for select standards

Standard	Primary Commodity	Review / adjust standard	Modify standard	Develop regional guidance	Develop guidance	Collaborate	Build capacity
1. 4C Association	Coffee			X			
3. BCI	Cotton		X		X	X	X
4. Bonsucro	Sugarcane		X		X	X	
5. CmiA	Cotton		X		X	X	X
6. Fairtrade	Coffee			X			
7. GLOBALG.A.P.	Mixed	X		X		X	
8. GRSB	Cattle		X		X	X	X
9. IFOAM	Mixed	X		X		X	
10. ProTerra	Soy			X			
11. RSB	Maize	X		X		X	
12. RSPO	Palm Oil	X		X		X	
13. RTRS	Soy			X			
14. SAI (Combined)	Mixed	X				X	
15. SAN	Mixed	X				X	
16. SRP	Rice		X		X	X	
17. UTZ	Coffee			X			

Table 13 (page 61) is quite general and is heavily influenced by the risk of the given commodity. As an example, while SAN is applicable to multiple crop types, cocoa (which has a low water risk in general) is their largest certified crop by volume. Accordingly, while SAN may want to consider guidance for cocoa growers in localized regions facing water risks, further efforts for that crop are not likely necessary. Conversely, where SAN is being applied to crops with higher water risks, such as cattle, a more comprehensive approach would result. In other words, the mapping exercise should ideally be completed for each commodity within a given system and broken down by type of water risk and water stewardship response.

Such an analysis was beyond the scope of this report, but could be developed. In particular, an analysis of regulatory and reputational water risks against water governance scores may be the most relevant area, given the general lack of coverage on water governance issues within the standards assessed. Standards are encouraged to undertake deeper level analyses to tailor solutions for their standards circumstances.

### What's the story with the cotton standards?

Cotton, as both a key global commodity, and a so-called “thirsty crop” is an issue that WWF continues to concern itself with. However, the nature of the production – often by small-scale farmers – makes standards and certification a challenging undertaking. To tackle this challenge, WWF has worked with both BCI and CmiA, to develop standards that place an emphasis on training and capacity building with farmers instead of heavy requirements (which can push growers away from some standard systems). The scores from this assessment reflect this farmer-centred approach towards change and do not speak to the effectiveness of such standards in reducing pesticide use through integrated pest management techniques and water use efficiency.

WWF remains highly supportive of these standards and recognises their considerable improvements over conventional cotton production.

Nevertheless, WWF also believes that all standards should remain open to continual improvement, and water stewardship has a role to play even with small-scale producers. Progressive models of community water governance continue to emerge in places like India, and it is critical that we harness these lessons to ensure the poorest farmers are also supported to mitigate water risks from which they can ill-afford to suffer.

Cotton makes up 55 % of Pakistans exports. However, vast amounts of water are sucked from rivers like the Indus (97 % to be exact) to irrigate cotton fields. Many initiatives are under way to tackle the water issues in cotton production.



## Pulling Together the Pieces: Recommendations and Conclusions

The findings show that there are strong benefits to standard systems when adopting a water stewardship approach.

This study concludes that all of the assessed agricultural sustainability standards address an array of water management issues, but currently have some key gaps when it comes to water stewardship, most notably around water governance issues. While recognising the good practices around encouraging water efficiency and minimising water pollution, and acknowledging that water risks vary by commodity

and region, there is still the general need to encourage growers to address their water risks. Water stewardship helps to mitigate water risks by considering the present and future catchment context, and engaging in collective action and catchment governance. All of these elements of water stewardship remain areas that would be well served through greater attention from the standards included in this study.

Recognising the challenges of modifying multi-stakeholder sustainability standard systems, this study proposes several pathways to consider, each of which may be more or less appropriate in light of the needs and context of a given standard. What is needed and appropriate for a coffee standard, such as 4C or UTZ, is different from what is needed for a cotton standard, such as BCI or CmiA. Every given standard's aims (scope), target audience, theory of change, water risk exposure, and governance model for updating requirements will influence how it incorporates water stewardship elements. A detailed analysis that explores the water risks facing each agricultural commodity in combination with the existing requirements, most notably related to water governance, would serve all of the standard systems well in helping to ensure their users are buffered from the impacts of water risks.

In terms of responding to water risks, supplementary guidance on water stewardship is an excellent starting point, and something that many standards have already begun. Indeed, recent years have shown an improvement not only in the amount of guidance, but also in the requirements of standard systems themselves as many have continued to place a greater emphasis on water issues.

This study suggests a dual-standard approach that leverages the strengths of complementary systems, such as AWS, WFN and ISO 14046, may offer significant benefits. Such theories need to be field-tested and coordinated to ensure financial viability for all parties involved.

This study has also determined that there remain significant opportunities for water stewardship learning by standard systems. First, standard systems would be well served to plug into the growing number of water stewardship reports and tools which will help to accelerate and strengthen their water risk mitigation efforts. Furthermore, many of the standards involved in this study have employed innovative approaches, wording, guidance, and so forth that represents a strong basis for learning and improvement within other standard systems. Simply put, there is a great deal these standards can learn from one another. Similarly, organisations such as the HCV Resource Network can provide a powerful, common rallying point for many standards to align efforts and improve consistency.

Beyond mere coordination, looking forward, collaboration will be critical to addressing water challenges. The International Social and Environmental Accreditation and Labelling (ISEAL) Alliance, the global membership association for sustainability standards, has acknowledged the need for improved coordination

Water continues to grow in its importance and is being recognised as a stand-alone issue that leaders must account for in the same manner as we have seen with energy and carbon issues.

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and consistency among standards to enhance their effectiveness. Indeed, ISEAL has developed codes and guidance to help standard system holders improve the credibility and effectiveness of their systems. ISEAL members have, in recent years, started to engage in mutual recognition akin to that pioneered by IFOAM. While some efforts have emerged, aligning thinking, requirements, data sets, auditing training, and the like will all help to improve effectiveness (via common approaches in which multiple systems operate), increase efficiency (via common data, for both M&E and auditing purposes), and ultimately create stronger standard systems. This is particularly true for users in water-stressed catchments, where common guidance, metrics, and having generally shared approaches will go a long way to ensuring collective solutions to shared water challenges. We encourage IFOAM, ISEAL, SAI and others to continue to facilitate collaboration and engage in discussions on landscape-based approaches that hold further promise for such collaboration going forward.

As seen in the 2015 World Economic Forum Global Risks report<sup>40</sup>, water continues to grow in its perceived importance and is increasingly being recognised as a stand-alone issue that leaders must account for in the same manner as we have seen with energy and carbon issues. Similarly, our terrestrial bias must give way to an equal consideration of aquatic issues, so that land rights become land and water rights, and land use conversion becomes synonymous with land and water use conversion. Awareness of the catchment context in which our food and fiber systems operate, and the water risks that stem from those contexts, is increasingly vital to ensure food, energy and water security. Not just for farmers, but for our communities, and for nature.

With these general thoughts in mind, four specific recommendations are provided to the standards community to enhance water stewardship in natural resource standards.

**Recommendation 1:**

**Further enhance the integrated water stewardship assessment framework and develop common guidance on water stewardship**

The integrated water stewardship assessment framework developed in this study represents a strong (but initial) step towards the establishment of a broadly accepted “water stewardship evaluation framework”. Through further and broader engagement with the standards community, the legitimacy of such a framework may be established and enhanced. Such a common framework will help to align efforts between SSI, Standards Map, WWF’s CAT and similar initiatives.

The common gap between all of these elements at present relates to the need to evaluate the extent to which water risks and moreover, collaborative approaches, including positive engagement in catchment governance processes, are covered by standard requirements. The ongoing focus on water management over water stewardship continues to recognise and reward only part of the solution when it comes to sustainable freshwater and water risk mitigation for growers.

Once such a common water stewardship framework is in place, common guidance can be developed (or simply referenced where it already exists, which is often the case) and derivative tools, such as the mapping and guidance tables, can be rolled out.

This does not imply the development of a set of universal requirements across

all standards. Different standards would still be able to focus on aspects of freshwater sustainability that are of key importance to their systems. However, all standards could benefit from and build on a shared understanding of the elements that are needed to address freshwater issues effectively, guidance on the kinds of actions that are needed to achieve successful outcomes, and descriptions of what successful outcomes look like in practice. WWF has already undertaken many of these elements and is well positioned to further develop this discussion via joint fora, such as the ISEAL Alliance membership.

For example:

- » Guidance on legal compliance would provide generic advice on key international agreements that are relevant to freshwater-related issues; the kind of national legislation that needs to be considered in relation to water use; methodologies for ensuring that legislation is implemented; examples of the way these can be specified within standards; methodologies for verifying compliance; etc.
- » Guidance on collective action would explain why collective action is needed; provide examples of the kinds of collective action that have been implemented successfully around the world; examples of the way collective action can be encouraged within standards; etc.

Such guidance would not need to be developed from scratch. This study found numerous examples of documents that could be used as the starting point for such guidance. A great deal of reference material on water stewardship may be drawn from Appendix B (Guidance) contained in the AWS Standard, which provides a strong initial starting point for common guidance. Similarly, there are other guidelines such as the RSB Water Assessment Guidelines, the RSB Guidelines on Water Rights and Social Impacts, Annex CB2 GLOBALG.A.P. Guidelines for Responsible Water Use, SAI Principles and Practices for Sustainable Water Management in Agriculture at a Farm Level, FAO Guidelines on Good Practices for Ground and Aerial Applications of Pesticides, as well as potential best practice examples from existing standards such as the SAN and RSPO standards.

The intent of the guidance documents would not be to create a ‘meta-standard’ or define best practice for standards content, but to create a shared toolkit that standards organisations could make use of to improve the way that standards address freshwater issues, somewhat akin to what HCVRN has done for HCV resources.

WWF has developed a number of guidance documents on water stewardship as has the United Nations Global Compact’s CEO Water Mandate initiative.

## **Recommendation 2:**

### **Encourage standards interoperability with respect to fresh water**

With a common framework and linked water stewardship guidance, standards systems are encouraged to consider referencing the same source materials, for example in relation to pesticides use, tillage, irrigation, social and environmental impact assessment, the identification and protection of water-related areas, etc. Reference to the same good practice documents ought to facilitate the interoperability of standards – a highly desirable trait for collective action on freshwater issues at the catchment level. Indeed, as a shared resource, having a “Rosetta Stone” that enables consistent measurement and collective stewardship will

Collaboration at  
a catchment level  
remains a key  
element for  
finding effective  
solutions to shared  
challenges.

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help to lower costs and improve effectiveness of standards for production sites, conformity assessment bodies and for standard system owners.

It was notable in reviewing the standards for this study how much duplication there is. In some cases standards specify different requirements (for example organic standards prohibit the use of synthetic pesticides whereas other standards may only prohibit the use of some pesticides, or simply specify good practice in their use). But in many cases standards appear to be trying to specify essentially the same requirements, but with multiple variations. In some cases, good practice documents already exist and WWF could have a role in simply identifying recommended documentation.

**Recommendation 3:  
Explore opportunities for mutual recognition and collaboration  
between commodity standards.**

Arguably, when it comes to standards, the most effective way to learn is by doing. In this regard, standard systems are encouraged to explore formal and informal means of addressing their respective weaknesses in ways that will best suit the needs of their production sites.

Collaboration at a catchment level remains a key element of not only water stewardship, but of effective solutions to shared water challenges. Working as a community on common water risks is in everyone's best interests and mutual recognition and formal collaboration agreements are advantageous in creating change at scale.

As a standalone water stewardship standard, the Alliance for Water Stewardship offers agricultural sustainability standards an interesting and flexible pathway to mitigating water risks. The use of a dual agricultural standard + AWS approach allows standards to maintain their current requirements and specifically target growers in catchments facing high water risks. Such "AWS bolt-on" approaches may offer significant benefits to all parties. Broadly speaking, there is a great deal to be said for collaboration between standard systems and this may take the form of mutual recognition of criteria, but also through joint training, joint auditing, etc. ISEAL has encouraged such collaboration in the past (e.g., RSB has established collaborations with fellow ISEAL members Bonsucro, and SAN) and such recognition helps to strengthen all standards.

**Recommendation 4:  
Steadily continue to strengthen water stewardship-related  
requirements in standards to help mitigate water risks.**

Every standard assessed in this study had room for improvement when it came to water stewardship. With water risks being present for all agricultural commodities and likely to grow in the coming years, all systems are well served to evaluate water risks and existing water stewardship requirements and consider the benefits of increasing the coverage of water stewardship practices in their requirements.

We acknowledge that modifying any multi-stakeholder standards is a slow process. Most systems are updated every few years, and changes can take years (or much longer!) to be implemented. There is not an expectation that standards can or will immediately modify their principles, criteria and indicators to reflect the findings of this study. Rather, the idea is to provide a foundation which can

be gradually built upon, and tailored to meet the needs of the specific niche of a given standard. Put differently, standards should prioritise water-related improvements in areas that are most material to their specific systems and user's requirements and risks. In certain cases, these may relate to WASH issues, in others it may be about climate change resilience. In other cases, standards may opt to retain the status quo and intentionally leave certain water issues aside due to very legitimate reasons. However, where such omissions occur, producers and consumers must be aware and take necessary actions to mitigate their material water risks through other means or accept the consequences of a failure to do so.

Agricultural standards must begin to move beyond the concept of water efficiency and pollution prevention to water stewardship, which involves catchment-based approaches. Mitigating water risks is ultimately a function of both on-site actions and shared actions on water governance within the basin

Revisiting any given standard system through such a “water stewardship lens” during its review period would enhance the probability that standards will gradually improve their water-related requirements. In this regard, standard systems (and their stakeholders) are encouraged to undertake the assessment in this study (using an updated framework if available, as well as updated information) in order to most efficiently and effectively target areas that will provide the greatest benefits to the users of their system.

Ultimately, water is not only a critical input for all commodity production, but a key element to the wellbeing of humans and nature. Without heightened awareness and action on water stewardship we jeopardise our food systems, our drinking water and aquatic biodiversity. As a community engaged in safeguarding natural resources, standards are well positioned to advance this cause and help drive change at scale.

More efficient irrigation technology remains a mean to lower consumption and costs. In order to mitigate future risks, growers have to find new ways to address shared challenges - such as a water stewardship approach.



## ANNEX A: Water Stewardship Assessment Framework Integration

Synthesised Framework (Category)	Synthesised Framework (Description)	AWS Criteria
<b>1. Water Governance and Management</b>	Does the standard speak to elements of water governance (including internal water management systems)	
<b>Water as a priority area within the standard</b>	Water highlighted as an issue at level of Principle (or equivalent), and/or all aspects of four key 'outputs' (governance, balance, quality and habitats) are clearly highlighted within standard as criteria.	All steps & outcomes
<b>Legal compliance</b>	There is a generic reference to legal compliance that would cover compliance with legal requirements related to water (e.g., abstraction, effluent) and/or specific reference to legal compliance in relation to water and implies some form of verification of compliance.	Comply with Legal and Regulator Requirements (4.1)
<b>Land and water rights (indigenous peoples' rights, traditional use rights, including Free, Prior and Informed Consent where applicable)</b>	There is explicit reference to compliance with Indigenous and/or local communities water rights, either referred to directly or else referred to by reference to ILO69, UN Declaration of Rights of Indigenous Peoples, or to national legislation which acknowledges such rights; OR there is reference to the principle of FPIC which would be expected to result in rights being recognised and respected in practice. NOTE: FPIC issues are restricted to this evaluation aspect.	Comply with Legal and Regulator Requirements (4.1)
<b>Consideration of catchment context</b>	There is explicit reference to the need for water users to be aware of the overall situation of water use and availability at the catchment level, including identifying and understanding shared water infrastructure, and an explicit requirement to work within the limitations of water use through catchment level governance mechanisms.	Define the Physical Scope (2.1), Gather water-related data for the catchment (2.3)
<b>Environmental and Social Impact Assessment</b>	There is an explicit requirement to carry out an assessment of the social and environmental impacts of the organisation's water use, and/or a generic requirement to carry out an SEIA with sufficient guidance to give confidence that it would include consideration of the impacts of water use.	Complete a voluntary Social Impact Assessment (2.13)
<b>Adaptive water management plan or policy</b>	There is an explicit requirement for users to develop an adaptive 'water management plan or policy' that brings together the main elements of water management within an integrated framework that ensures legal and rights compliance and resilience to water-related risks.	Develop a water stewardship policy (1.2), Develop a system that promotes and evaluates water-related legal compliance (3.1), Create a site water stewardship strategy and plan (3.2), Demonstrate responsiveness and resilience to water-related risks into the site's incident response plan (3.3)
<b>Transparency, disclosure and stakeholder consultation</b>	There are explicit requirements for the organisation to make information about its planned and actual water use publicly available, and to consult with affected stakeholders in relation to its plans.	Identify stakeholders, their water-related challenges and the site's sphere of influence (2.2), Consult stakeholders on water-related performance (5.3), Disclose water-related internal governance (6.1), Disclose annual site water stewardship performance (6.2), Disclose efforts to address shared water challenges (6.3)

CAT v. 3.8 Indicator(s)	2050 KPI Criteria	SSI	Standards Map
			NOTE: Primary references bolded
Section D covers “Water & Soil” but it would strengthen CAT from a water perspective if it were separated out from soils.	Chemical Use		
Producers are required to have legal land tenure or title and valid rights to use the management unit (A2); Producers are required to comply with all applicable national and international laws and regulations (A3); Producers are required to take measures against unauthorised or illegal activities and settlement on the management unit (A9); Producers are required to commit in writing not to offer or receive bribes or engage in any other form of corruption (A10); Producers are required to take measures against any illegal or inappropriate hunting, fishing or collecting in the management unit (E48).	Legal Production		Legally protected and internationally recognised areas for their biodiversity, Compliance with local social and environmental laws and regulations, Compliance with local zoning and protected or heritage area requirements, Compliance to international regulations, norms and conventions, Environmental laws and regulations, Cultural and religion rights: general principle
Producers are required to identify legal and customary rights of tenure, access and use of other parties that apply on the management unit (A4); Producers are required to uphold legal and customary rights of tenure, access and use of other parties, unless these rights are delegated through documented Free, Prior and Informed Consent (A5); Producers are required to respect the rights, customs and culture of indigenous peoples as defined in the UN Declaration on the Rights of Indigenous Peoples (2007) and ILO Convention 169 (1989) (A6).	Local and Indigenous Communities		Land title and use rights, Rights of indigenous peoples, Free, prior and informed consent of local communities, Local communities access to livelihoods (land & aquatic resource, transport and housing), Cultural and religion rights: general principle
	Area-based Management		Water dependencies
Producers are required to identify negative impacts from operations on communities and individuals (B12); Producers are required to take measures to minimise and mitigate negative impacts from operations on communities and individuals (B13); Producers are required to assess potential impacts on communities and individuals, including impacts on food security and water availability, prior to any significant intensification or expansion of cultivation or infrastructure (B15); Producers are required to regularly monitor their impacts on the local economy and to adapt management as necessary for improvement (B20); Producers are required to identify water resources potentially affected by operations, in as well as outside the management unit (D31).			Impact assessment policy for new production, impact assessment for ongoing production / harvesting, Impacts on wildlife populations, Impact assessment on health, safety, and security of local activities, Impact assessment on access to basic services to local communities, Environmental risks and impacts
Producers are required to continuously improve key practices and operations (G61); Producers are required to have management plans appropriate to the scale and intensity of the operation that demonstrate commitment to long-term social, environmental and economic viability (G62); Producers are required to regularly revise their management plans to reflect the results of monitoring and evaluation (G63).	Water Management	Environment - 11. Water use in management plan	Water management plan
Producers are required to engage in dialogue with neighbouring communities and individuals (B11); Producers are required to make summaries of their management plans publicly available on their website (large producers) or by a request (small/medium producers) (G64); Producers are required to make summaries of their social and environmental impact assessments publicly available on their website (large producers) or by a request (small/medium producers) (G66); Producers are required to make summaries of their HCV assessments publicly available on their website (large producers) or through a request (small/medium producers) (G69).		Social - 27. Community consultation	Stakeholder analysis and engagement planning in E&S management system

Synthesised Framework (Category)	Synthesised Framework (Description)	AWS Criteria
<b>1. Water Governance and Management</b>	Does the standard speak to elements of water governance (including internal water management systems)	
<b>Dispute resolution</b>	There are explicit requirements for processes to be in place that would allow stakeholders to bring concerns related to the organisation's water use to the organisation's attention, and that would oblige the organisation to make a serious effort to resolve any such issues to the satisfaction of the complainant, including through the possibility of compensation. NOTE: General stakeholder feedback mechanisms are covered above; it must involve a requirement related to dispute resolution.	Consult stakeholders on water-related performance (5.3)
<b>Catchment-level collaboration / collective action</b>	There are explicit requirements in place for the organisation to identify and collaborate with other water users in the catchment, either directly or else through participation in existing catchment level associations or plans, to address catchment level issues. NOTE: While supply chain actions may fall into this category, the emphasis in this element is around explicit spatial proximity within the affected catchment(s).	Notify the relevant catchment authority of the site's water stewardship plans (3.4), Participate positively in catchment governance (4.5), Notify the owners of shared water-related infrastructure of any concerns (4.8)
<b>Consideration of indirect water use and supply chain engagement</b>	The organisation is required to identify its indirect water use and, if this is significant, to implement actions to reduce the impact of such indirect use, most notably in the supply chain.	Improve the site's understanding of its indirect water use (2.5), Maintain or improve indirect water use within the catchment (4.6)
<b>Future scenario &amp; resilience planning</b>	The organisation is required to identify projections for water use in its catchment in the long term (e.g., to consider the implications of climate change projections and population growth) and to consider the implications (i.e., resilience requirements) for the sustainability of its own water needs.	Gather water-related data for the catchment (2.3), Understand shared water-related challenges in the catchment (2.6)
<b>Formal leadership commitment on water</b>	There is a requirement for a form of organisational leadership (e.g., leader/board/etc.) to have a formal, signed commitment to address water issues within and beyond the site.	Establish a leadership commitment on water stewardship (1.1)
<b>Water, Sanitation and Hygiene for staff</b>	The standard has explicit provisions that require the site to take actions to provide water, sanitation and hygiene awareness to staff.	Provide access to safe drinking water, adequate sanitation and hygiene awareness (WASH) for workers on-site
<b>Water risk assessment</b>	There is an explicit requirement for users to assess and consider water risks (i.e., physical, regulatory and reputational water risks) and/or considerations of water-related emergency incidents and their potential impacts on the site and the catchment.	Understand and prioritise the site's water risks and opportunities (2.7), Evaluate the site's water stewardship performance, risks and benefits in the catchment context (5.1), Evaluate water-related emergency incidents and extreme events (5.2)
<b>Positive participation in catchment governance and policy engagement</b>	There is an explicit requirement to engage catchment-level governance mechanisms (e.g., coordinating efforts) or on water policy issues.	Notify the relevant catchment authority of the site's water stewardship plans (3.4), Participate positively in catchment governance (4.5)

CAT v. 3.8 Indicator(s)	2050 KPI Criteria	SSI	Standards Map
			NOTE: Primary references bolded
Producers are required to engage with affected stakeholders and document measures taken to resolve disputes related to land tenure, access and use (A7); Producers are required to engage with affected stakeholders and document measures taken to resolve disputes related to water access and use (A8); Producers are required to address grievances and provide fair compensation for negative impacts of operations on local communities and individuals (B14); Producers are required to address grievances related to working conditions and workers' rights and to provide compensation for occupational injuries (C29).			Policies and procedures to address workers' grievances
			Supply chain stakeholders mapping, Criteria relating to policies encouraging clients, staff and suppliers to consider sustainability issues (reduce GHG emissions, waste, water use...)
Producers are required to take measures to increase resilience and reduce negative impacts from severe climate events (F56).			
		Social - 15. Healthy work conditions, Social - 16. Access to safe drinking water at work, Social - 17. Access to sanitary facilities at work, Social - 19. Access to training	Promotion / enhancement of housing and sanitary facilities, Workers access to safe drinking water
			Environmental risks and impacts

Synthesised Framework (Category)	Synthesised Framework (Description)	AWS Criteria
<b>2. Water Balance</b>		
<b>Quantitative water use information (environmental flow, water use, net withdrawal, monitoring)</b>	The organisation is required to collect or at least have access to information about its own planned and actual water use on a monthly basis over the year, and has information about the availability of any 'blue water' it would need to use to meet its needs. The organisation has information about the efficiency of its water use (e.g. use per unit of production). There is evidence that its water needs can be met without compromising the 'environmental flow' requirements of any affected water courses.	2.3, 2.4
<b>Water use efficiency</b>	The organisation is required to implement all applicable and effective actions to ensure that its own water use is minimised. Measures may include: prohibition of irrigation; efficient irrigation; soil management; proactive support for water reuse or recycling.	4.2
<b>Absolute water quantity limitations (surface and groundwater)</b>	There are clear, explicit limitations that would prevent the organisation withdrawing water if this would compromise the 'environmental flow' requirements of any affected water courses.	4.9, 4.14
<b>3. Water Qlty. Status</b>		
<b>Qualitative water use information (indicators, monitoring)</b>	The organisation is required to collect or at least have access to appropriate information about any impacts it may have on water quality. Information may include measurement of water quality of any waste water, measurement of water quality of water sources at the point of use and at the point that water leaves the organisation's sphere of influence. Measurements include key aspects of water quality that might be affected by the organisation's activities, such as pH, temperature, COD, sediment load, pesticide pollution, nitrate level, etc.	2.3, 2.4
<b>Effluent management: fertiliser, pesticides, soil management/ erosion, waste management</b>	The organisation is required to implement all applicable and effective actions to ensure that its own negative impacts on water quality are minimised. Measures may include: prohibitions on pesticide use; effective limitations on pesticide use; effective limitations on fertiliser use to ensure there is no excess nutrients entering water courses; measures to prevent soil erosion; measures to clean waste water, etc.	4.3
<b>Absolute water quality limitations</b>	There are clear, explicit thresholds defining impacts on water quality, such that if the organisation causes any significant negative impact on water quality it could not be certified.	4.10

CAT v. 3.8 Indicator(s)	2050 KPI Criteria	SSI	Standards Map
Producers are required to regularly monitor their impacts on soil and water and to adapt management as necessary for improvement (D40).	Water Management	Environment - 10. Water practices in scarcity (dependencies)	Water resources monitoring and use, Water dependencies, Water extraction / irrigation, Assessment of water usage, Food production site - Water supply volume and quality monitored
	Water Management	Environment - 10. Water practices in scarcity (dependencies), Environment - 12. Water reduction criteria	Water use including reuse and recycling, Water extraction / irrigation
Producers are required to take measures to minimise and mitigate negative impacts from operations on water resources (D32); Producers are not allowed to create or aggravate situations of water scarcity (D33).			Water extraction / irrigation
Producers are required to regularly monitor their impacts on soil and water and to adapt management as necessary for improvement (D40).	Water Management		Water quality, Food production contamination risks - waste disposal contamination risk assessment and discharge procedures
Producers are required to ensure that workers are adequately equipped, instructed and trained for their tasks, including safe use and handling of chemicals (C26); Producers are required to avoid or minimise run-off and siltation of watercourses (D36); Producers are required to take measures to minimise negative impacts from operations on soil resources (D37); Producers are required to avoid or minimise soil erosion (D38); Producers are required to maintain or improve soil quality (D39); Producers are required to implement integrated pest management practices that minimise the use of pesticides (F51); Producers are not allowed to use Hazardous chemicals (as defined by WHO 1A and B and the Stockholm and Rotterdam conventions) (F52); Producers are required to document all application, handling, storage and disposal of agrochemicals and to ensure that procedures comply with good practice and/or manufacturers' recommendations (F53); Producers are required to take measures to avoid or minimise negative impacts of agrochemical use on human health and the environment (F54); Producers are required to ensure that any use of biological control agents comply with internationally recognised standards and/or protocols (F55); Producers are not allowed to use Hazardous chemicals class WHO 2 (I84); Producers are not allowed to use Hazardous chemicals according to the PAN International list of Highly Hazardous Pesticides (I85); Producers adopt agro-ecologic practices, including the non-use of pesticides, biological control of pests, etc. (I86).	Manure Management, Nutrient Management, Soil Management, Pest Management, Water Management	Environment - 1. Soil conversion (erosion prevention), Environment - 7. Waste disposal, Environment - 8. Waste management, Environment - 9. Pollution, Environment - 13. Waste-water disposal, Environment - 19. Integrated Pest Management, Environment - 20. Enforcement of a prohibited list, Environment - 21. Complete prohibition of synthetics	Wastewater management / treatment, Water contamination / pollution, Water quality, Water disposal / storage, Soil conservation / erosion, Chemical and related materials or substances prohibition, Respect of a list of prohibited chemicals, Respect of a list of authorized chemicals, Implementation of an Integrated Pest Management (IPM), Agrochemicals management and records keeping, Agrochemicals storage and labelling, Production / process chemicals
Producers are required to take measures to minimise and mitigate negative impacts from operations on water resources (D32); Producers are required to maintain or improve the quality of surface and ground water (D34).			Water contamination / pollution, Mitigation of transboundary effects of water pollution, Water quality

Synthesised Framework (Category)	Synthesised Framework (Description)	AWS Criteria
<b>4. Important Water-related Areas</b>		
<b>Management of riparian, wetland and other water-related habitat areas</b>	The organisation is required to identify, map, protect, and manage or restore riparian, wetland and other significant water-related habitats on its property in ways that protect water-related biodiversity, preferably based on an integrated biodiversity management plan with a clear indication that it would include consideration of water-related habitats.	2.3, 2.4, 4.4
<b>Management of water-related areas of religious, cultural or other social importance</b>	The organisation is required to identify, map, protect, and manage or restore Water-related Areas of Religious, Cultural or other Social Importance on its property. A generic reference to the HCV concept should be supported by explicit reference to need to protect areas with high social values.	2.3, 2.4, 4.4
<b>Water-related land cover conversion (past and future) and restoration</b>	The standard has explicit provisions to prevent the conversion of water-related areas that are likely to have high conservation value, either before or during the period during which the property is certified.	
<b>Rare, threatened and endangered freshwater species</b>	The standard has explicit provisions, in addition to any general requirements to protect riparian or wetland habitats on its property, designed to ensure the protection of any rare, threatened or endangered species that may be affected by the organisation's activities in relation to water or water-related habitats, e.g., through special programs to identify and protect such species, through the identification and protection of nest sites, feeding areas, etc.; through measures to prevent hunting or fishing. A generic reference to the HCV concept should be supported by explicit reference to need to protect RTE species.	2.3, 2.4, 4.4
<b>Aquatic invasive species</b>	The standard has explicit provisions that effectively prevent any accidental release or introduction by the organisation of invasive species (animal or plant) that would have any deleterious effect on riparian ecology, including e.g., fish escapes, escapes of animals that prey on water-related species, species that have a negative impact on water-related habitats, etc. Where invasive species are already present, there is a requirement to take effective action to limit any damage caused by the invasive species.	
<b>Ecosystem services</b>	The standard has an explicit requirement to identify, understand, and maintain/enhance water-related ecosystem services in affected/reliant catchments.	2.3, 2.4, 2.7, 2.9, 4.3, 4.15, 6.7

CAT v. 3.8 Indicator(s)	2050 KPI Criteria	SSI	Standards Map
Producers are required to maintain natural wetlands in undrained conditions (D35); Producers are required to identify biodiversity values, potentially affected by operations, in as well as outside the management unit (E41); Producers are required to take measures to minimise and mitigate negative impacts from operations on biodiversity values (E42); Producers are required to assess and maintain HCVs category 1 (concentrations of rare and threatened species), 2 (large landscapes in a relatively natural state) and 3 (rare and threatened ecosystems) in the management unit (E45); Producers are required to maintain representative areas of native ecosystems in the management unit (E46); Producers are required to maintain or restore native vegetation along streams and watercourses (E47); Producers are required to regularly monitor their impacts on biodiversity and to adapt management as necessary for improvement (E50).	Priority Areas Protection, Land Management System	Environment - 3. Habitat set-asides, Environment - 5. Prohibition of conversion of high conservation value land	Sustainable management of natural resources, Habitat / eco-system restoration / rehabilitation, Protecting biodiversity zones via set asides, Ecological niches / corridors, High Conservation Value Areas, Legally protected and internationally recognised areas for their biodiversity, Respect of natural or cultural heritage
Producers are required to identify and respect sites of cultural and religious significance in the management unit (B16); Producers are required to assess and maintain High Conservation Values (HCVs) category 5 (basic necessities for local communities) in the management unit (B17).	Priority Areas Protection,	Environment - 5. Prohibition of conversion of high conservation value land	High Conservation Value Areas, Social culture and sites, Internationally recognised / legally protected sites and cultural heritage, Respect of natural or cultural heritage
Producers are required to assess potential impacts on biodiversity values prior to significant intensification or expansion of cultivation or infrastructure (E43); Producers are required to use independent expertise for assessing social and environmental impacts prior to significant intensification or expansion of cultivation or infrastructure (G65); Producers are required to identify HCVs (all six categories) prior to significant expansion of cultivation or plantations (G67); Producers are required to use independent expertise for assessing HCVs prior to expansion of cultivation or plantations (G68); Producers are not allowed to expand cultivation or establish plantations at the expense of one or more HCVs (G70).	Land Management System		
Producers are required to protect rare and threatened species and their habitats in the management unit (E44).			Impacts on wildlife populations
Producers are not allowed to introduce or use invasive alien species in the management unit (E49).			Protection of native species against invasive species
Producers are required to identify biodiversity values, potentially affected by operations, in as well as outside the management unit (E41); Producers are required to take measures to minimise and mitigate negative impacts from operations on biodiversity values (E42).	Ecosystem Functions		Risks and impacts on ecosystem services

Synthesised Framework (Category)	Synthesised Framework (Description)	AWS Criteria
Intentionally unaccounted for		

CAT v. 3.8 Indicator(s)	2050 KPI Criteria	SSI	Standards Map
<p>Producers are required to support economic development by providing opportunities for local employment and provision of services (B18); Producers are required to actively engage in welfare programs, where relevant to the social context (B19); Producers are required to respect the core ILO rights of workers as defined in the Declaration on Fundamental Principles and Rights at Work (1998) (C21); Producers are required to ensure that children under the age of 15 (or higher if stipulated in national law) do not carry out productive work in the management unit (C22); Producers are not allowed to use forced or otherwise involuntary labor (C23); Producers are required to ensure that there is no discrimination at work and that workers are not subject to any form of corporal punishment, abuse, harassment or intimidation (C24); Producers are required to respect workers' freedom of association and right to collective bargaining (C27); Producers are required to ensure that wages, working hours and leave comply with, or exceed, applicable legislation and sector minimum standards (C28); Producers are required to regularly monitor working conditions and to adapt management as necessary for improvement (C30); Producers are required to estimate sequestration and emissions of greenhouse gases from the management unit (F57); Producers are required to take measures to reduce any net emissions of greenhouse gases from the management unit (F58); Producers are not allowed to convert native forest and/or areas of high above-ground carbon stocks to expand cultivation or plantations (F59); Producers are not allowed to expand cultivation or plantations on peat soils and/or areas of high below-ground carbon stocks (F60); Producers are required to regularly monitor and evaluate key economic performance indicators like yields, revenues and costs and take measures as necessary for improvement (H71); Producers are required to promote use of a diverse range of resources and services from the management unit (H72); Producers are required to ensure that products are not harvested at levels above sustainable yields (H73); Producers are required to ensure that tree cover is regenerated to pre-harvesting (or more natural) conditions after logging (H74); Producers are required to use tree species for regeneration that are well adapted to site conditions (H75); Producers are not allowed to use genetically modified trees in the management unit (H76); Producers are required to use management practices appropriate for the tree species, site conditions and management objectives (H77); Producers are required to use management practices in natural/semi natural forests that reflect natural disturbance regimes (H78); Producers are required to maintain high scenic landscape values (H79); Producers are required to monitor forest condition and take measures as necessary to maintain forest vitality and tree species composition (H80); Producers are required to cultivate a mix of genotypes of each main crop (I81); The standard does not allow the use of GMO crop species (I82); The standard has a separated supply-chain for non-GMO (I83); Large scale producers are not allowed to expand cultivation in ways that impact negatively on local food security (I87); Producers are required to reduce waste through reuse, recycling or other environmentally appropriate utilisation (I88); Producers of annual crops are required to practise crop rotation. Producers of perennial crops are required to practise intercropping or promote mixtures of crops and native species (I89); The standard has requirements related to optimise nutrition of the cultivated crops and the raised animals (I90) intercropping or promote mixtures of crops and native species (I89); The standard has requirements related to optimise nutrition of the cultivated crops and the raised animals (I90).</p>			

## ANNEX B: Methodological limitations

The following provides a brief explanation for the methodological limitations noted in this study:

» **The distinction between ‘limited fulfilment’, ‘general fulfilment’, and ‘substantive fulfilment’, despite best efforts to provide a consistently ‘objective’ rubric, is ultimately subjective.**

Each of the criteria in the framework is quite broad in scope, and can include several different aspects, or different approaches to achieving the general objective. Whilst the results, taken together, should provide a general indication of the extent to which key water-related issues are addressed by the different standards, the assessment of individual criteria are necessarily simplified.

» **Different standards take different approaches to compliance which are not fully accounted for by this assessment:**

- Some standards specify that all requirements have to be met, but recognise that there may be ‘minor’ non-conformities which will be met over time;
  - Some standards distinguish between ‘requirements’ and ‘recommendations’, where the requirements have to be met in order to receive a certificate, but recommendations are not obligatory;
  - Some standards distinguish between core requirements, all of which have to be met in order to receive a certificate, and supplementary requirements of which only some proportion (e.g. 60 %) have to be met (or if met are recognised with higher levels of achievement); in certain cases these supplementary requirements involve a timeline in which to be met, typically between three and six years;
  - Some standards intentionally leave certain elements (e.g., some water-related issues) out of scope because they are focussed on different elements.
- » The assessment of the different standards has not tried to tease apart these sometimes subtle distinctions, and so does not distinguish between standards that would require elements to be met prior to certification, and standards that would only require elements to be met in the long term. The assessment has however tried not to grade a standard as achieving ‘substantive fulfilment’ on a criterion if an element is only ‘recommended’, or is clearly not obligatory even in the long term.
- » **The standards take a range of different approaches (process vs. outcome) to achieving improvements in water-related impacts.** For example, in relation to water quality some standards focus on outcomes (‘water shall not be polluted’) without specifying what actions are required to achieve these outcomes, whereas others focus on actions (e.g., specifying that pesticides shall be stored, used and disposed of in particular ways) and then assume that if these actions take place they will result in less pollution. It is recognised that different approaches may be equally effective in reducing impacts, but will show up differently in the analysis of framework criteria.
- » **Some standards specify generic requirements in relation to particular issues** (e.g., social/ environmental impact assessment, or biodiversity conservation) without making any reference to water-specific elements of such issues. In general, in order to achieve the ‘substantive fulfilment’ explicit reference to water-specific elements has been required, or else sufficient detail or guidance on implementation to give confidence that water-specific issues would be identified in practice. In certain cases, this lack of water specificity has resulted in the shift from “substantive fulfilment” to ‘general fulfilment’.
- » **It should be recognised that some or many of the integrated framework criteria may be intentionally out of scope for some standards.** Different aspects of management may be more or less important in different contexts. For some crops irrigation may be a critical issue; other crops may be typically rain fed; some standards consider aspects of processing (e.g., for ‘wet method’ processing of coffee) others do not; in some situations (e.g., when an agricultural frontier is expanding) consideration of land

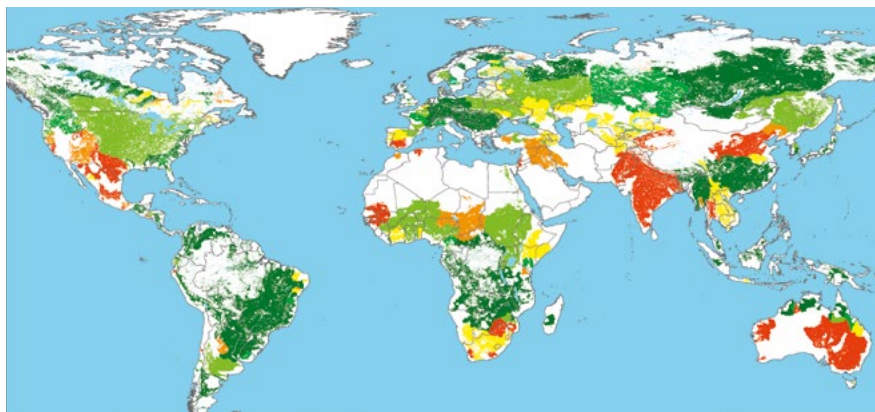
use rights or land use change may be of critical importance, whereas in other situations (e.g., where land use in relation to a particular commodity is generally stable) this may not be of particular significance. The fact that a particular standard does not pay particular attention to a given issue may mean that the issue is not of major significance in the context in which the standard is used. It is not necessarily a weakness of the standard. Another common example is that not all standards make an explicit, generic requirement for legal compliance. That does not imply that operations meeting the standard do not comply with the law, it simply means that they would not be *certified* as complying with the law. Auditing can be costly, and there may be little value in allocating resources to verifying a criterion that is generally met even in the absence of the standard.

- » **In relation to Table 5, the thresholds between the grades for the combined ‘water stewardship outcomes’ are somewhat arbitrarily set** at 25 %, 50 %, and 75 %. The scores of several of the standards are close to the threshold on several of the water stewardship outcomes. An increase in the score of a single criterion (and as noted the scores are somewhat subjective) would have led to a change in the grade for the whole ‘outcome’. As such, the categories are broadly indicative and are not intended as the primary message or aim of this work.
- » **Scoring speaks to requirement wording, not impacts.** This study is not intended to evaluate the water-related impacts, rather it assesses the language within standards that speaks to water stewardship issues. Furthermore, standards take a range of different approaches (process vs. outcome-based) to achieving improvements in water-related impacts, all of which may be equally effective in driving impacts and all of which are treated equally within the scoring.
- » **Average scores for any given standard mask many of the strengths and weaknesses** which may be critical with regards to specific water risks facing users of such standards in local conditions.
- » **Broadly speaking, the differences between “0 or 1” and “2 or 3” are more important than the differences between a “0 and 1” or “2 and 3”.** Scores of three often indicate strong, water-specific practices, whereas scores of two are often sufficient to address the issue, but still have room for potential improvement (even simply via guidance).

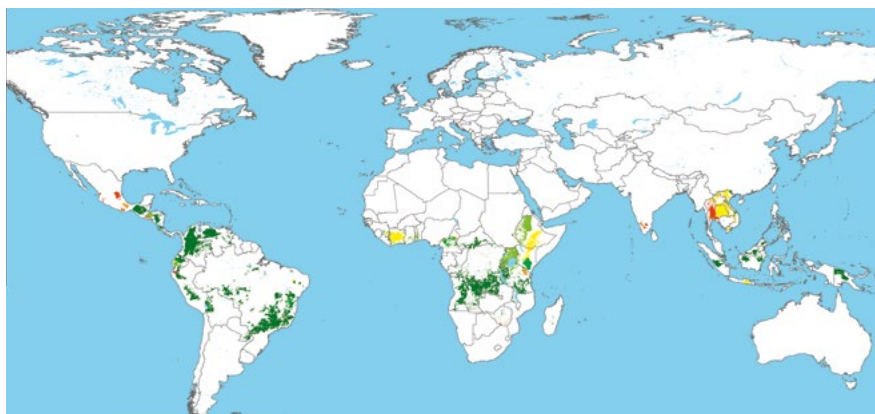
The authors recognise these limitations and encourage feedback to improve the methodology employed in this study. The WWF CAT, which now embodies many of these requirements, is always under continual improvement and will seek to capture refinements through time.

**ANNEX C:**  
Detailed Water Risk  
Maps for  
7 Commodities:  
Physical Water Scarcity

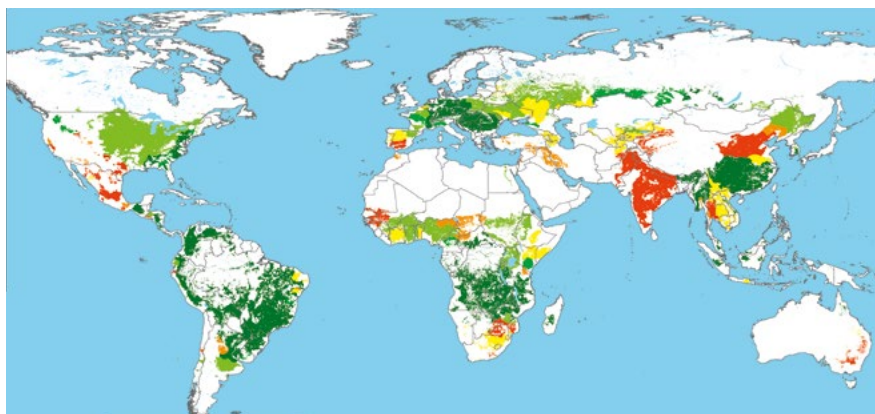
Cattle



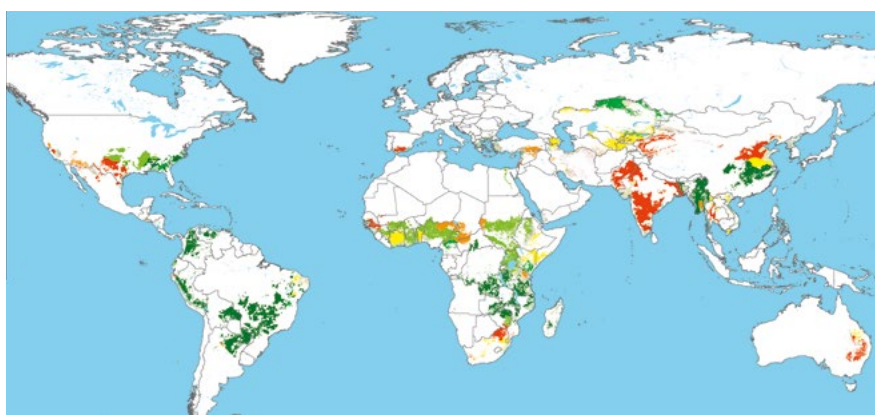
Coffee



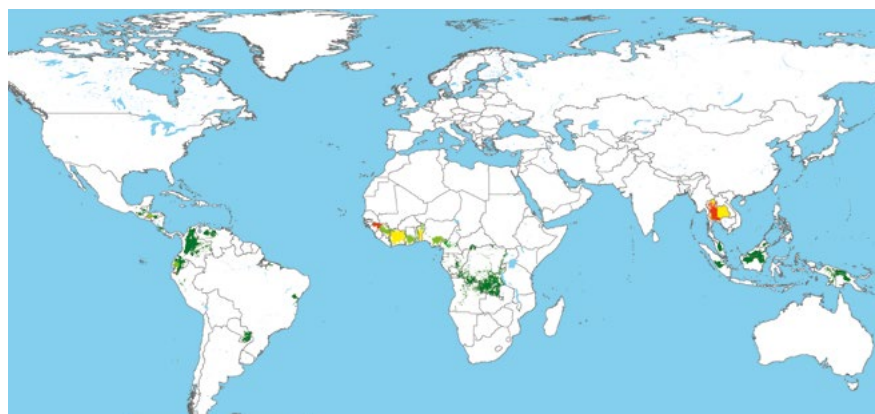
Corn/Maize



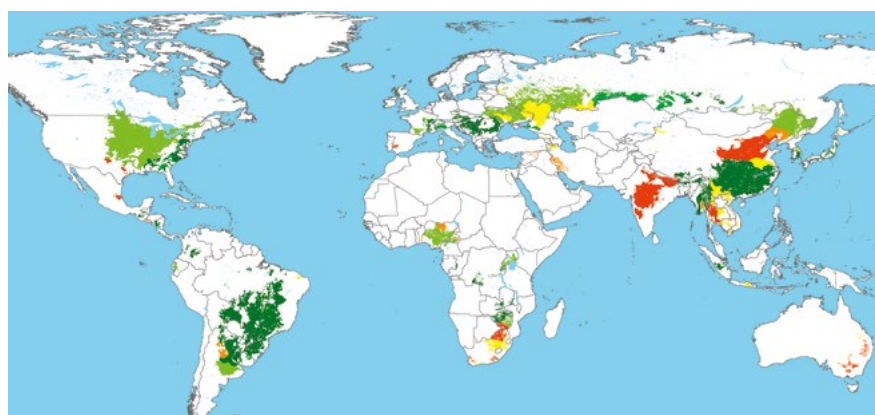
Cotton



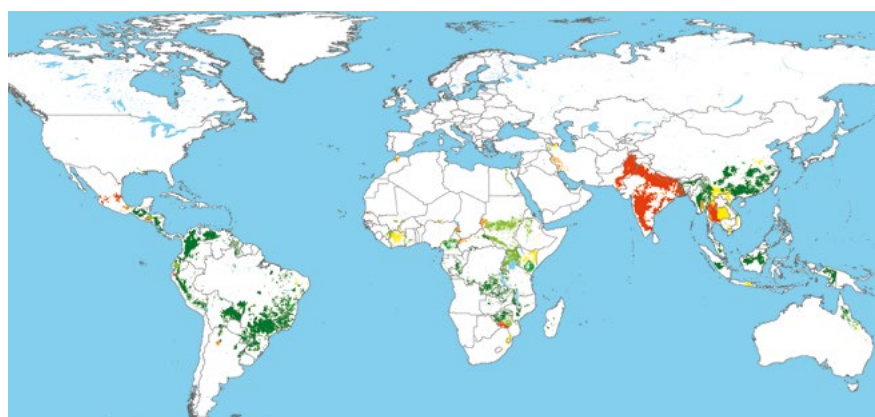
Palm Oil



Soy

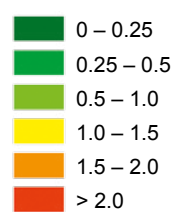


Sugarcane



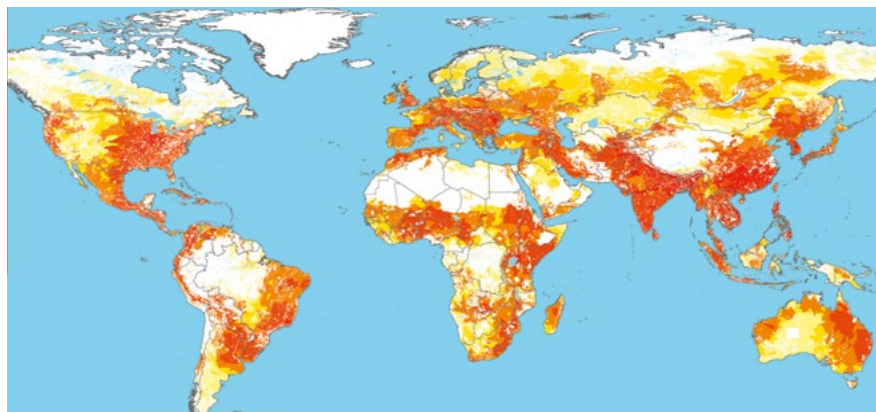
Source: US National Park Service

Water Stress of Commodity  
in Production Areas

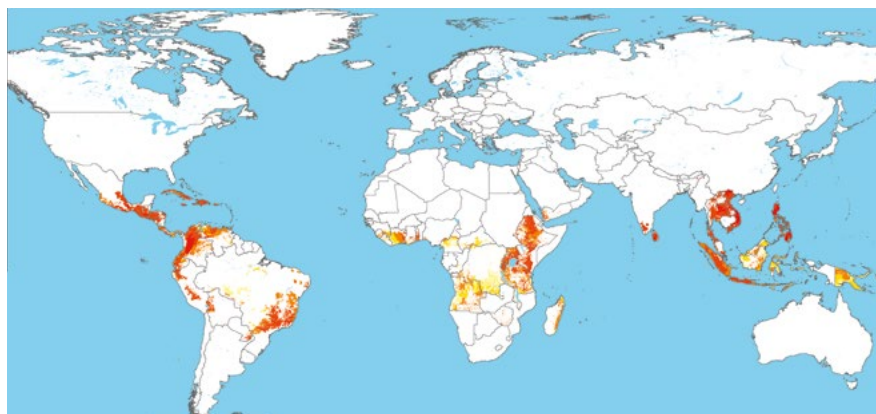


**ANNEX C:**  
Detailed Water Risk  
Maps for  
7 Commodities:  
Number of Floods

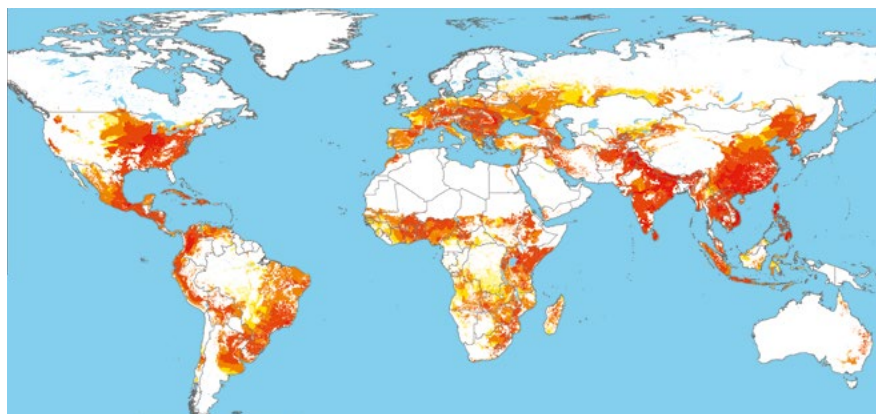
Cattle



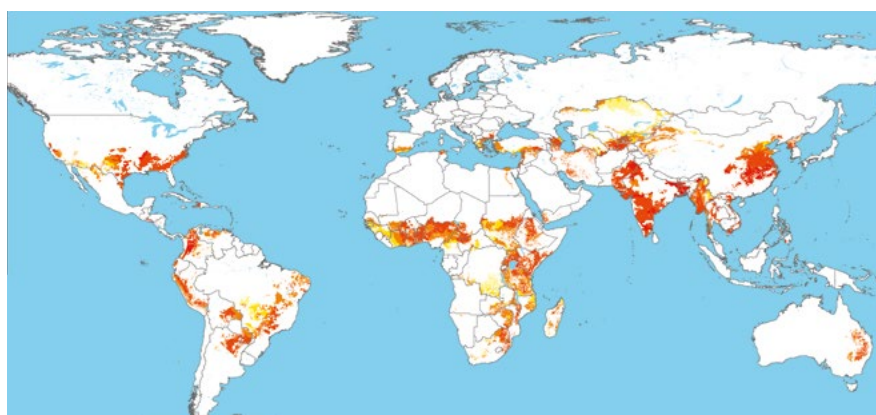
Coffee



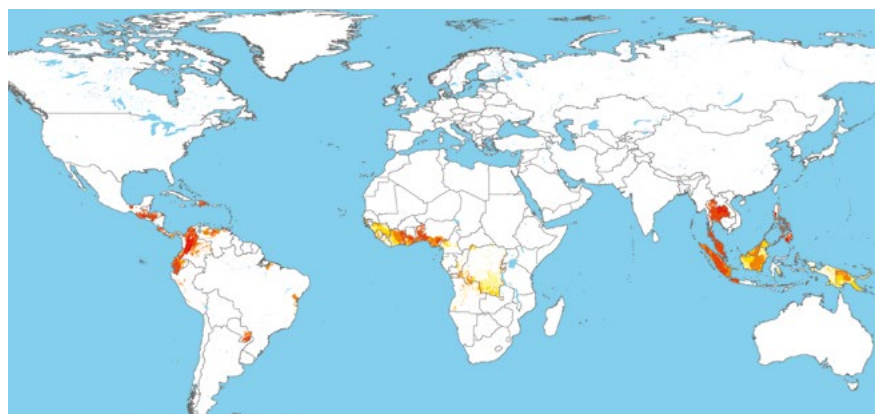
Corn/Maize



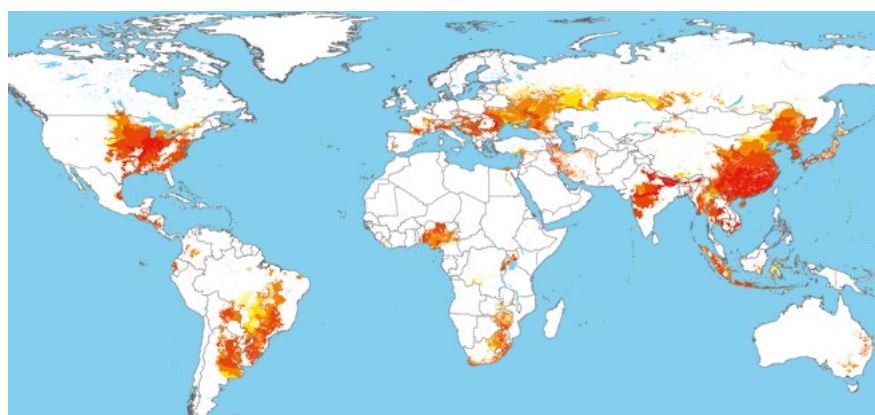
Cotton



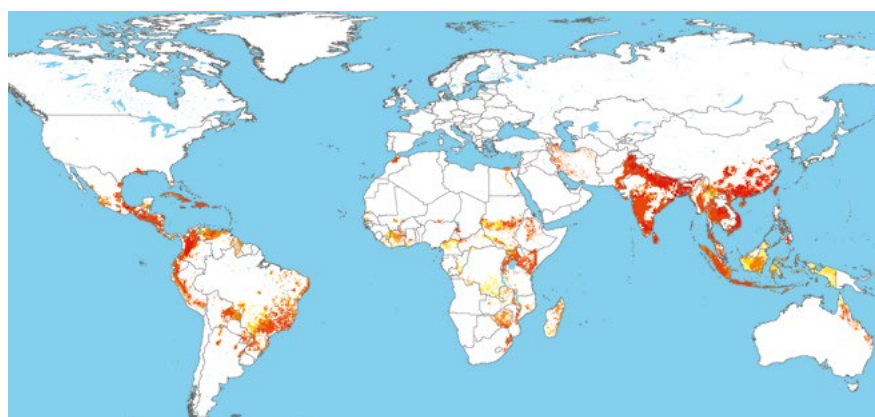
Palm Oil



Soy

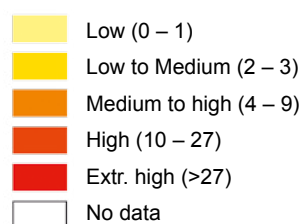


Sugarcane



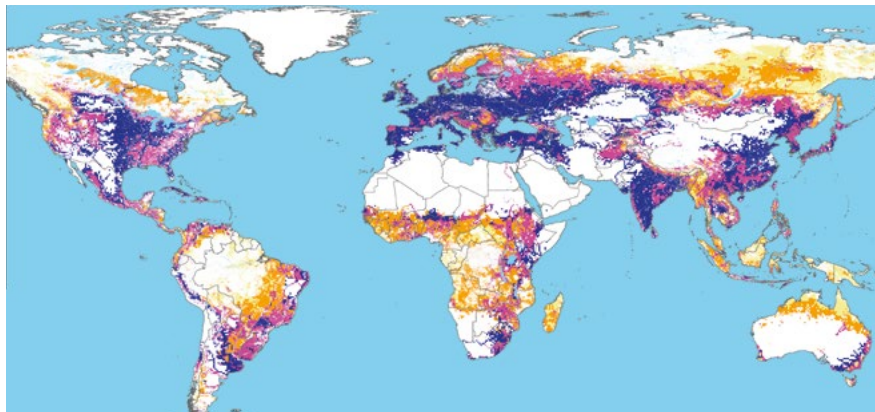
Source: US National Park Service

Number Of Floods from  
1985–2011 in Commodity  
Production Areas

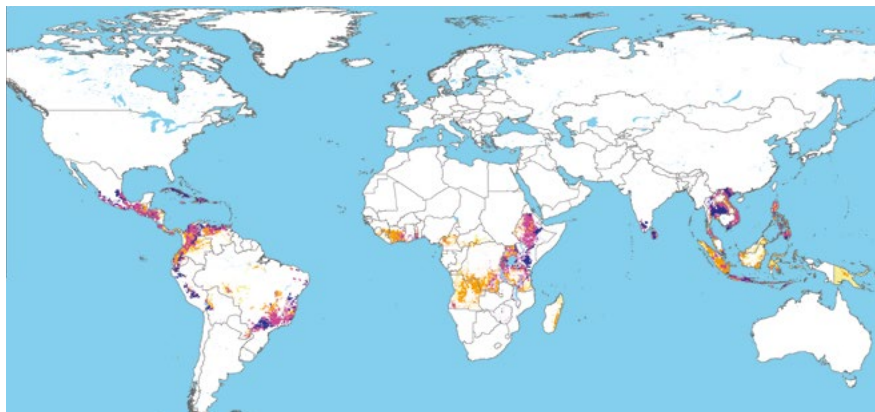


**ANNEX C:**  
**Detailed Water Risk**  
**Maps for**  
**7 Commodities:**  
**Water Pollution**

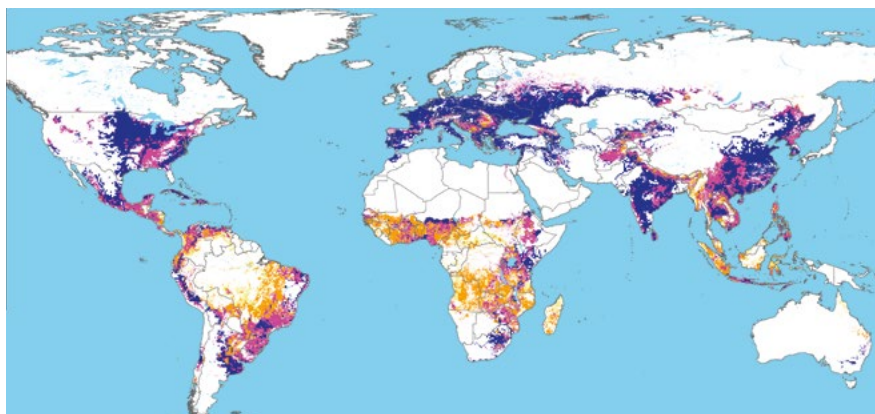
Cattle



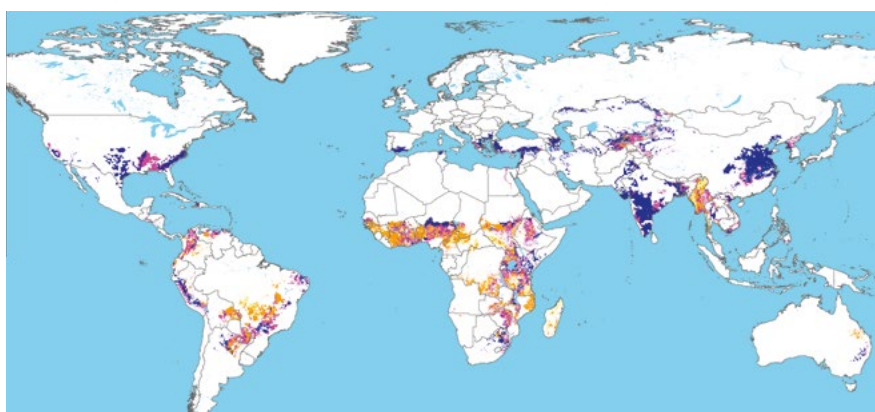
Coffee



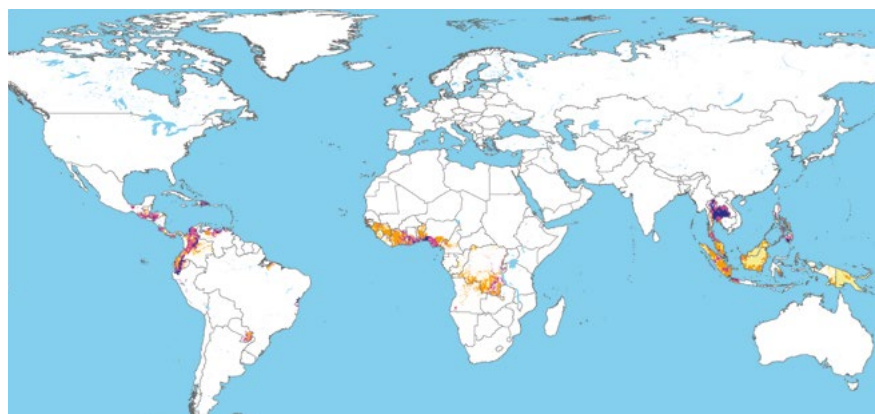
Corn/Maize



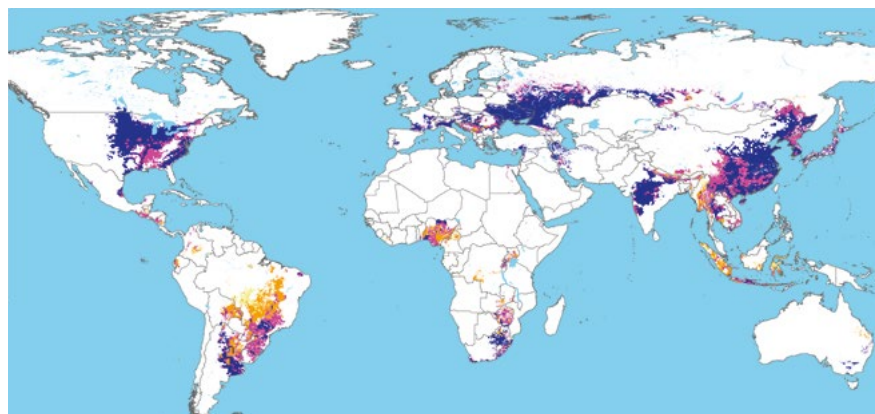
Cotton



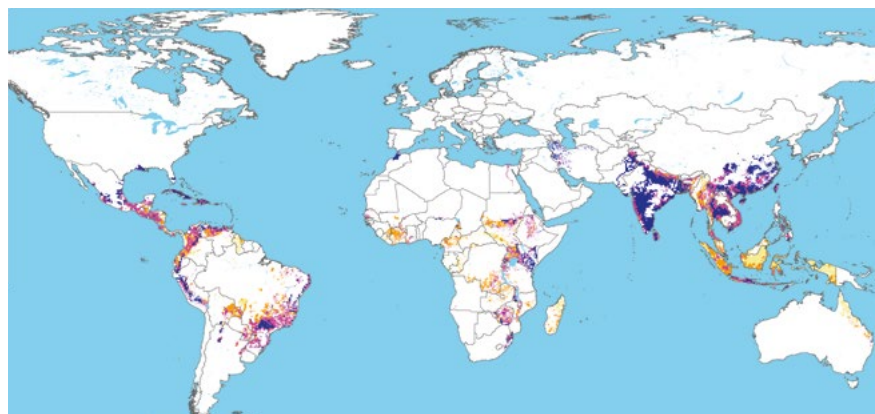
Palm Oil



Soy

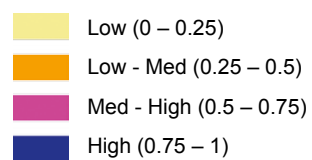


Sugarcane



Source: US National Park Service

Total Water Pollution in  
Commodity Production Areas



## ANNEX D: The AWS Criteria Mapped Against the WWF Water Stewardship Standard

1. Water Awareness		2. Knowledge of Impact		3. Internal Action		4. Collective Action		5. Influence Governance	
2.1	Define the physical scope	2.4	Gather water-related data for the site on governance, water balance, water quality and important water-related areas and costs	1.1	Establish a leadership commitment on water stewardship	1.6	Commit to directly assisting with community water needs in times of stress	4.5	Participate positively in catchment governance
2.2	Identify stakeholders, their water-related challenges and the site's sphere of influence	2.5	Improve the site's understanding of its indirect water use (inputs and outsourced services)	1.2	Develop a water stewardship policy	2.8	Support and undertake joint water-related data collection	4.12	Achieve best practice results and strengthen capacity in water governance
2.3	Gather water-related data for the catchment	2.6	Understand shared water-related challenges in the catchment	1.3	Further the Alliance for Water Stewardship	3.4	Notify the relevant (catchment) authority of the site's water stewardship plans		
2.10	Review a formal study on future water resources scenarios	2.7	Understand and prioritise the site's water risks and opportunities	1.4	Commit to other initiatives that advance effective water stewardship	3.5	Gain stakeholder consensus on the site's water stewardship targets		
		2.9	Gather additional, detailed water-related data	1.5	Secure a water stewardship commitment from the organisation's senior-most executive or the organisation's governance body	4.6	Maintain or improve indirect water use within the catchment		
		2.11	Conduct a detailed, indirect water use evaluation	3.1	Develop a system that promotes and evaluates water-related legal compliance	4.8	Notify the owners of shared water-related infrastructure of any concerns		
		2.12	Understand groundwater status or environmental flows and the site's potential contributions	3.2	Create a site water stewardship strategy and plan	4.13	Advance regionally specific industrial water-related benchmarking		
		2.13	Complete a voluntary Social Impact Assessment	3.3	Demonstrate responsiveness and resilience to water-related risks in the site's incident response plan	4.14	Reallocate saved water for social or environmental needs		
		5.1	Evaluate the site's water stewardship performance, risks and benefits in the catchment context	3.6	Develop a formal plan for climate change adaptation	4.15	Engage in collective action to address shared water challenges		
		5.2	Evaluate water-related emergency incidents and extreme events	4.1	Comply with water-related legal and regulatory requirements and respect water rights	4.16	Drive reduced indirect water use throughout the site's supply chain and outsourced water-related service providers		
		5.4	Update water stewardship and incident response plans	4.2	Maintain or improve site water balance	4.17	Complete implementation of water-related initiatives		
		5.5	Conduct an executive or governance body-level review of water stewardship efforts	4.3	Maintain or improve site water quality	4.18	Provide access to safe drinking water, adequate sanitation and hygiene awareness off site		
		6.8	Discuss site-level water stewardship in the organisation's annual report	4.4	Maintain or improve the status of the site's Important Water-Related Areas	5.3	Consult stakeholders on water-related performance		
				4.7	Provide access to safe drinking water, adequate sanitation and hygiene awareness (WASH) for workers on site	5.6	Conduct a formal stakeholder evaluation		
				4.9	Achieve best practice results on site water balance	6.7	Implement a programme for water education		
		4.10	Achieve best practice results on site water quality						
		4.11	Achieve best practice results on Important Water-Related Areas through restoration						
		6.1	Disclose water-related internal governance						
		6.2	Disclose annual site water stewardship performance against the site's targets.						
		6.3	Disclose efforts to address shared water challenges						
		6.4	Drive transparency in water-related compliance						
		6.5	Increase awareness of water issues within the site						
		6.6	Disclose water risks to owners (in alignment with recognised disclosure frameworks)						

## Footnotes

- 1) Potts, J., Lynch, M., Wilkings, A., Huppé, G., Cunningham, M., and Voora, V. (2014) State of Sustainability Initiatives: Standards and the Green Economy. Available online: [https://www.iisd.org/pdf/2014/ssi\\_2014.pdf](https://www.iisd.org/pdf/2014/ssi_2014.pdf)
- 2) Mekonnen, M.M. and Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, *Hydrology and Earth System Sciences*, 15(5): 1577-1600. & Mekonnen, M.M. and Hoekstra, A.Y. (2012) A global assessment of the water footprint of farm animal products, *Ecosystems*, 15(3): 401–415. Available online: <http://www.waterfootprint.org/?page=files/WaterStat-ProductWaterFootprints>
- 3) WWF – What We Do: Sustainable Farming [http://wwf.panda.org/what\\_we\\_do/footprint/agriculture/](http://wwf.panda.org/what_we_do/footprint/agriculture/); Sustainable Forestry [http://wwf.panda.org/what\\_we\\_do/footprint/forestry/certification/](http://wwf.panda.org/what_we_do/footprint/forestry/certification/); Water Stewardship [http://wwf.panda.org/what\\_we\\_do/how\\_we\\_work/conservation/freshwater/water\\_management/](http://wwf.panda.org/what_we_do/how_we_work/conservation/freshwater/water_management/)
- 4) WWF (2015) [http://wwf.panda.org/who\\_we\\_are/](http://wwf.panda.org/who_we_are/)
- 5) Millennium Ecosystem Assessment, 2005. Ecosystems and human well-being: wetlands and water synthesis. Island Press, Washington, DC.
- 6) Postel, S.L., Daily, G.C. and Ehrlich, P., 1996. Human appropriation of renewable freshwater, *Science*, 192: 785-788.
- 7) Revenga, C., Brunner, J., Henninger, N., Kassem, K. and Payne, R., 2000
- 8) IPCC, 2007. Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
- 9) Hoekstra, A.Y. and Mekonnen, M.M. (2012) PNAS, Vol. 109, No. 9, 3232–3237, 28 February 2012.
- 10) WWF (2012) Living Planet Report 2014: Species and Spaces, People and Places.
- 11) World Economic Forum (2015) Global Risks 2015: 10th Edition. Available online: <http://www.weforum.org/reports/global-risks-report-2015>
- 12) United Nations (2014) Open working group proposal for Sustainable Development Goals. Available online: available at <https://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf> and <http://undocs.org/A/68/970>
- 13) Beef, Bio-Energy/Bio-Material Crops, Cotton, Dairy, Farmed Salmon, Farmed Shrimp, Palm Oil, Pulp & Paper, Soy, Sugarcane, Timber, Whitefish, Tuna, Wild-Caught Forage Fish, Wild-Caught Shrimp.
- 14) For example, via contributions to the development of the Better Cotton Initiative, Bonsucro and the System of Rice Intensification.
- 15) See Ecolabel Index or IFC's T4SD database for a current and complete list.
- 16) Hoekstra, A.Y. and Mekonnen, M.M. (2012) PNAS, Vol. 109, No. 9, 3232–3237, 28 February 2012.
- 17) FAO (2015) Top 10 Commodities for 2013, Food and Agricultural commodities production / Commodities by region. Available online: [http://faostat3.fao.org/browse/rankings/commodities\\_by\\_regions/E](http://faostat3.fao.org/browse/rankings/commodities_by_regions/E) Accessed: 30 March 2015.
- 18) Hoekstra, A.Y. and Mekonnen, M.M. (2012) PNAS, Vol. 109, No. 9, 3232–3237, 28 February 2012.
- 19) Hoekstra, A.Y. and Mekonnen, M.M. (2012) PNAS, Vol. 109, No. 9, 3232–3237, 28 February 2012.
- 20) Batchelor, C., Reddy, V.R., Linstead, C., Dhar, M., Roy, S. and May, R. (2014) Do water-saving technologies improve environmental flows? *Journal of Hydrology*, Volume 518: 140–149.
- 21) One notable parallel and linked effort was a WWF report entitled 'The 2050 Criteria: Guide to Responsible Investment in Agricultural, Forest and Seafood Commodities'. This study, which employs aligned thinking to CAT, employed a framework linking ten high level 'categories of impact' to a set of generic 'Key Performance Criteria' (2050 KPC). Twelve of WWF's 2050 KPC were highlighted as being central to the way sustainability standards seek to drive better water use and management: Area-based Management, Chemical Use, Ecosystem Functions, Land Management System, Legal Production, Local and Indigenous Communities, Manure Management, Nutrient Management, Pest Management, Priority Areas Protection, Soil Management, Water Management. Annex A provides clarity on how this aligns both with CAT v.3.9 and the framework for this study.
- 22) <http://www.standardsmap.org/>
- 23) <http://www.intracen.org/itc/market-data/standards-map/overview/>
- 24) <http://www.ilo.org/indigenous/Conventions/no169/lang--en/index.htm>
- 25) [http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf)
- 26) "Environmental flows" are defined as the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems that human livelihoods and well-being depend on. (Brisbane Declaration) For additional information on environmental flows, please see: [http://awsassets.wwf.ca/downloads/factsheet\\_eflows\\_final\\_030914.pdf](http://awsassets.wwf.ca/downloads/factsheet_eflows_final_030914.pdf)
- 27) For a detailed understanding of the Water Risk Filter's data sets and methodology, please see: <http://waterriskfilter.panda.org/Content/Documents/Risk%20Indicators.pdf>

- 28) Crop areas derived from Monfreda, C., Ramankutty, N. and Foley, J.A. (2008) Farming the planet: 2. Geographic distribution of crop areas, yields, physiological types, and net primary production in the year 2000, *Global Biogeochemical Cycles*, Vol. 22(1).
- 29) UN.org (2010) The human right to water and sanitation. [http://www.un.org/waterforlifedecade/human\\_right\\_to\\_water.shtml](http://www.un.org/waterforlifedecade/human_right_to_water.shtml)  
For a detailed discussion on this issue, please see: Pacific Institute & Shift (2015) Guidance for Companies on Respecting the Human Right to Water and Sanitation: Bringing a Human Rights Lens to Corporate Water Stewardship. Available online: <http://pacinst.org/wp-content/uploads/sites/21/2015/01/Guidance-on-Business-Respect-for-the-HRWS.pdf>
- 30) Ray, I (2007) Women, Water, and Development, *Annual Review of Environment and Resources*, Vol. 32: 421–449
- 31) Daily, G. (1997) *Nature's Services: societal dependence on natural ecosystems*. Island Press.
- 32) Abell, R., Morgan, S.K. and Morgan, A.J. (in publication) Taking HCV from forests to freshwaters, *Environmental Management*.
- 33) See HCV Resource Network: <https://www.hcvnetwork.org/resources/cg-management-and-monitoring-2014-english> and <https://www.hcvnetwork.org/als/>
- 34) Pimentel, D., Zuniga, R., and Morrison, D. (2005) Update on the environmental and economic costs associated with alien-invasive species in the United States, *Ecological Economics*, Volume 52, Issue 3, 15 February 2005, Pages 273–288
- 35) See <http://www.wbcds.org/washatworkplace.aspx>
- 36) Pacific Institute & Shift (2015) Guidance for Companies on Respecting the Human Right to Water and Sanitation: Bringing a Human Rights Lens to Corporate Water Stewardship.  
Available online: <http://pacinst.org/wp-content/uploads/sites/21/2015/01/Guidance-on-Business-Respect-for-the-HRWS.pdf>
- 37) See <http://waterriskfilter.panda.org/>
- 38) For example, crop and basin-specific versions of work along the lines of Smakhtin, V., Revenga, C. & Döll, P. (2004) A Pilot Global Assessment of Environmental Water Requirements and Scarcity, *Water International*, Volume 29, Issue 3 or Hoekstra, A.Y., Mekonnen, M.M., Chapagain, A.K., Mathews, R.E. and Richter, B.D. (2012) Global Monthly Water Scarcity: Blue Water Footprints versus Blue Water Availability, *PLoS ONE* 7(2): e32688. doi:10.1371/journal.pone.0032688
- 39) In addition to SAI, several of the other standard systems included in this study currently have supplementary water-specific guidance. To the best of our knowledge, these include: RSB, BCI (via national guidance), GLOBALG.A.P., IFOAM, RSPO (Peat BMPs), and Naturland.
- 40) World Economic Forum (2015) *Global Risks 2015: 10th Edition*.  
Available online: <http://www.weforum.org/reports/global-risks-report-2015>



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