Environmental Engineering and Management Journal

October 2023, Vol. 22, No. 10, 1681-1687
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu
http://doi.org/10.30638/eemj.2023.143

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THE WATER STEWARDSHIP APPROACH TOWARDS RESILIENT WATER USE

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Abstract

Climate change is altering patterns of weather and water all around the world and, uneven water distribution is amongst the most compromising aspects. Water-related challenges may have serious impacts on a country in terms of economic losses, livelihoods, and political stability. The need to safeguard the water resource is becoming a growing necessity for many multinational companies which often operate in vulnerable and water-stressed environments.
The water stewardship approach and the Alliance for Water Stewardship (AWS) Certification is offering a standardized solution to sustainable water management by implementing a 360-degree approach that acts both in local and territorial contexts and it is applicable to all organization and industrial sectors. AWS is the first internationally recognized Standard for sustainable and resilient water use: the certification allows companies to reduce their water footprint, through external engagement and synergic cooperation between parties. Consequently, issues are address not only inside the site's physical boundaries but also directly on and with the catchment context through a stakeholder inclusive process. In the following article, we aim to illustrate the benefits and mitigation actions implemented by a multi-national company following the water stewardship approach and the standardized framework given by the AWS Standard. By implementing the AWS Standard, it is possible for companies to safeguard their surrounding territories and communities, formalize and optimize their commitment into water saving and increase the environmental international awareness through mitigation actions recognized and adopted by AWS.

Key words: catchment, multi-stakeholder governance, stewardship, sustainability, water security

Received: May, 2023; Revised final: September, 2023; Accepted: September, 2023; Published in final edited form: October, 2023

1. Introduction

The world is dealing with numerous interconnected crises that have increased the level of uncertainty around the globe. In this context, natural resource calamities are amongst the top 10 global risks as reported by the United Nations in 2022 (World Economic Forum, 2022). In this paper we will focus on those risks known to provoke water crises, and on potential mitigation solutions that water demanding companies can potentially apply to avoid one of the most critical, upcoming situations of our time.

In the last 15 years, water-related challenges have been exacerbating due to a multitude of factors linked to climate change, population growth and consequent overexploitation and mismanagement (Carvalho and Van Tulder, 2022). Demand of fresh, potable water is constantly increasing, especially in emerging economies, as is competition and pressure from agriculture, manufacturing, and energy sectors. This can be highlighted by the fact that from 1900 to 2010, global freshwater consumption has grown by over 600% (UNESCO, 2021). Freshwater resources are very limited.

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We currently relay on less than 1% feasibly usable freshwater reserves on Earth. The lack of availability and resilient management of water resources can have major negative impacts on both social, economic and development aspects of a country (Moreno-Pinzani, 2021). For this reason, water crises must be considered a shared responsibility: they involve a multitude of causes and consequences and will potentially impact a huge number of people and sectors, for which no single solution is available (Carvalho and Van Tulder, 2022).

Before thinking about how to act, it must be understood that water can be extremely complex to deal with. A given water source never feeds one actor alone, but a multitude of different stakeholders located in a common catchment area. Companies often find themselves operating in areas subjected to water-related vulnerabilities, many of which remain unperceived, especially in the short term. According to the Carbon Disclosure Project's (CDP, 2020) Global Report, the cost of inaction on water risks, especially for the manufacturing sector, is up to five times the cost of action. Consequently, the need of resilient management strategies to avoid physical, reputational, and regulatory water risks that may affect business productivity, is becoming impellent for all multinational companies, especially those operating in vulnerable and water-stressed environments.

Based on new, growing awareness and understanding that water risks affect not only single sites, but a multitude of different key figures in a common territory, the term water stewardship was born. This emerging paradigm sustains that water-related issues can only be fully addressed and mitigated through external engagement (Morrison and Schulte, 2014) and synergic cooperation between parties. Consequently, water stewardship practices aim to address issues not only inside but especially outside a site's physical boundary, thus engaging and acting directly on and with the catchment context in a long-term multi-stakeholder pathway.

2. Baseline approach and methods

2.1. Clarification of concepts

The first global water conference organized by the United Nations in Mar del Plata, Argentina, in 1977, was the first steppingstone towards concrete and meaningful discussions in formalizing a standardized approach in ensuring sustainable continuity in water resource use. However, it was only after the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, also known as the Rio Conference in 1992, that the concept of Integrated Water Resource Management (IWRM) was truly formalized and put into practice. The IWRM is defined as an approach which promotes the co-ordinated, synergic development and management of water and related resources in order to maximize economic and social well-being in an equitable manner, without compromising the sustainability of vital ecosystems. On these principles the IWRM approach has been discussed and taken into consideration by all the following water-related summits and conferences, but the major challenge has remained its effective implementation on-the-ground (Rahaman and Varis, 2005).

We can say that the Alliance for Water Stewardship (AWS) Standard System (here forward Standard) is a paradigm deriving and strictly connected to the IWRM approach, as it is defined as the use of water that is environmentally sustainable, socially equal, and economically beneficial, achieved through a stakeholder inclusive process that involves site and catchment-based activities (Magnani et al., 2020). The AWS Standard is focused on implementing actions in a *catchment area*, a physical area of land which the site relies upon for its water supply and discharge, including the upstream and downstream areas which may be impacted by the site's activity. A catchment area is defined considering both surface water and groundwater if the site is relying on multiple water sources.

2.2. Baseline approach

It is safe to say that we are all touched, either directly or indirectly, by water risks. Some countries may face them at more dramatic scale, whilst others may still live in idyllic short-term situation in which water is still readily available and free. Numerous water-intensive multi-national companies are however acting fast and now, especially those that have numerous water-demanding operational activities scattered in vulnerable areas world-wide. They are committing to long-term sustainable water management and stewardship practices to safeguard and positively impact their territories' water resources and ensure a supply that is secure, especially in the long run.

The question is, how are they managing to do this? In the last 10 years, many companies have been implementing an innovative, globally recognized, how-to framework for stewardship implementation, defined as the AWS Standard. The Standard is designed around a Plan-Do-Check-Act management concept subdivided into 5 phases (or Steps), focused not only on the operational site but also on the supply chain and territorial context that surround it. The scope is to not only reduce a site's water footprint but contribute through the engagement of public and private sector stakeholders to the identification and mitigation of shared water challenges, which would otherwise remain unperceived if focus of actions were limited only to a site's four walls.

2.3. Methods

To fully understand how a particular operational site may implement the Standard in its everyday activities and as a long-term commitment, it is necessary to explain and detail further the Standard structure itself. As previously anticipated, the

Standard is subdivided into 5 main steps which are, in turn, subdivided into criteria and indicators which must be fulfilled and applied with standard compliance. The degree of compliance may vary from a basic, core level, to more advance levels of water stewardship maturity (Gold or Platinum levels). Standard implementation also implies a path of continuous improvement, evaluation of achievements against targets and implementation of ameliorative actions over time.

The methodology on which the Standard relies upon for water stewardship achievement can be classified into two main categories (Figs. 1, 2):

1 Outcome compliance
2 Standard Step indicator implementation

Although the two are interconnected and strictly reliant upon each other, the fulfilment of a particular standard step does not automatically imply the obtainment of a specific outcome.

Fig. 1. The Alliance for Water Stewardship (AWS) Standard Steps categories designed around a Plan-Do-Check-Act management concept

Fig. 2. The Alliance for Water Stewardship (AWS) Standard Outcomes categories for water stewardship achievement

At this stage, a detailed description of each category must be undertaken.

2.3.1. Outcome compliance

The 5 AWS Outcomes represent the fundamental steppingstones of optimum water stewardship practices that benefit the site as well as the catchment area. They do not correspond to a particular Step but are a result of correct Standard implementation:

- *Good Water Quality Status*: active contribution to ensuring optimum water quality in relation to the site (i.e., respect of legal threshold levels for outgoing wastewater/incoming water) and the catchment area based on credible data from environmental agencies, academic studies and/or direct sample collection
- *Sustainable Water Balance*: active contribution to ensuring sustainable water use in relation to the site (i.e., respect of legal abstraction limits) and the catchment area based on water balance studies
- *Good Water Governance*: active contribution to water/wastewater management in the catchment area (i.e., protection, monitoring, treatment, policy framework etc.) synergically with institutions, public sectors, and government agencies, as well as other organizations
- *Secure Important Water-Related Areas* (IWRAs): active contribution to assessing, monitoring, restoring and/or maintaining the status of specific water-related areas of environmental, cultural, community and/or economic importance
- *Water, Sanitation and Hygiene* (WASH): active contribution to providing, improving and/or maintaining the provision of safe water, sanitation and hygiene for employees and local catchment communities in need.

2.3.2. Standard step indicator implementation

The Standard indicators have a particular focus and scope based on the 5 Steps that they are bound to comply with:

- Step 1 indicators are all about collecting and analyzing data from the site, indirect water use of its service/raw material providers, the catchment area of interest, and stakeholders in relation to the 5 Outcomes (quality, quantity, governance, WASH and IWRAs), water risks, and shared challenges as well as mitigation actions and opportunities.
- Step 2 indicators are focused on developing three principal aspects related to water stewardship:
  - public commitment;
  - system for maintaining and tracking water-related regulatory compliance;
  - developing a strategy and plan with actions (technological and/or socioeconomic), goals and targets linked to the 5 Outcomes with the scope of addressing the water risks/challenges identified in Step 1.
- Step 3 indicators are based on providing evidence of the 'doing' to verify conformance and/or achievement of the following:
  - actions to implement to achieve goals/targets (Step 2);
  - 5 outcomes;
  - water rights and legal prescriptions;

- indirect water use;
- stakeholder engagement.

- Step 4 indicators regard evaluating and measuring performance (both positive and negative) of what has been achieved (so far) based on planned actions and targets (Step 2), as well as water-related emergency incidents or compliance violations. Stakeholders must be direct contributors to this Step as they provide valuable insights and suggestions for improvements. Based on evaluation results, the plan (Step 2) must be adapted and integrated accordingly.
- Step 5 indicators regard the communication and disclosure part of the Standard, which must be executed with the scope of publicly sharing internal governance, water risks and shared challenges (Step 1), planned actions (Step 2) and performances (Step 4), stakeholder synergies and (if applicable) any significant water-related compliance violations.

Based on this framework, focused on complying with 5 specific AWS Outcomes and implementing the indicators belonging to the 5 Standard Steps, any type of site, anywhere in the world, may formally and credibly implement with an adequate level of maturity, a successful and resilient water stewardship *modus operandi.*

3. Case studies

To portray the relevant array of results which arise from Standard implementation, we will illustrate a case study of a multi-national manufacturing company that operates in the tobacco industry. Philip Morris International (PMI) has, since 2018, incorporated water stewardship and the AWS Certification as a fundamental pillar of its sustainability initiatives and core of its business strategy. PMI believes that working efficiently goes hand in hand with resiliently safeguarding and managing the environment (Philip Morris International, 2021a). This year, PMI has received, for the third consecutive year, a triple A rating from CDP on its performance in protecting forest, tackling climate change, and water security.

By conducting annual and dynamic materiality assessments to identify, assess and prioritize Environmental, Social, and Governance (ESG) topics of interest (Philip Morris International, 2021b) (Fig. 3), PMI has shed light on the growing and fundamental importance of sustainable water management and stewardship for its operations. The reason is that water is vital in PMI's activities: from tobacco cultivation to manufacturing, all products require water. PMI's 2021 Materiality Assessment additionally identified water as an emerging environmental issue in terms of potential outward impact, on society and plant, and inward impact on PMI's operations (Philip Morris International, 2021a) (Fig. 4). PMI's agricultural supply chain accounts for approximately 50% of PMI's total water footprint, while approximately 40% comes from other raw material producers and approximately 5% from direct manufacturing operations (Philip Morris International, 2022).

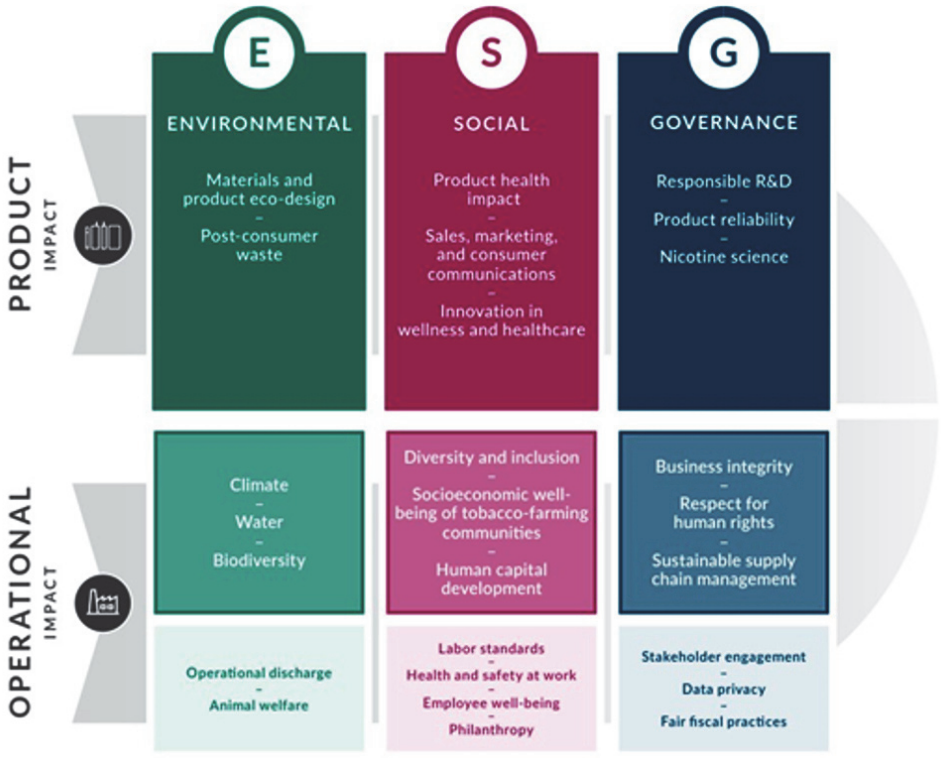

Fig. 3. Top ranking Environmental, Social, and Governance (ESG)'s topics for Philip Morris International (PMI) (Philip Morris International, 2021a)

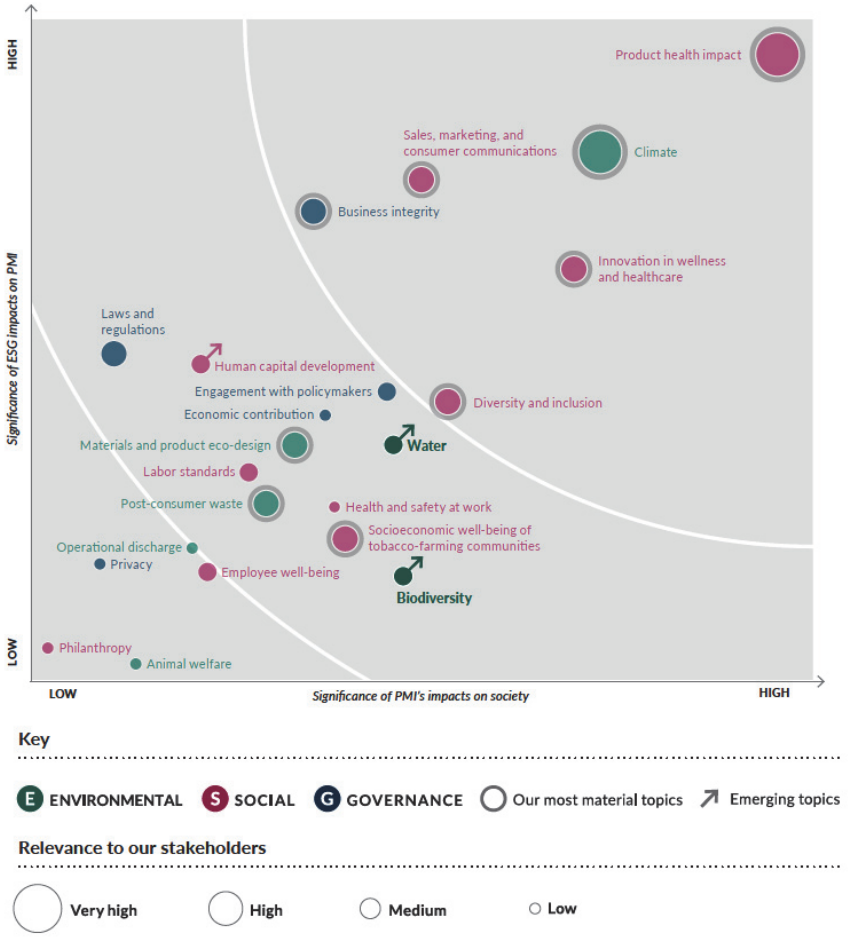

Fig. 4. Materiality matrix illustrating the results of Philip Morris International (PMI)'s Sustainability Materiality Assessment and identifying water as an emerging environmental issue (Philip Morris International, 2022)

Consequently, the global goal of implementing the AWS Standard to all relevant manufacturing facilities by 2025 (Philip Morris International, 2022), was a strategic decision to mitigate and reduce not only a facility's water footprint, but also the indirect water use of its raw material producers. In 2018 the first AWS pilot site deployed in Brazil. Following its success, 17 manufacturing facilities followed the Certification roadmap (Argentina, Brazil, Czech Republic, Greece, Indonesia, Italy, Korea, Mexico, Netherlands, Philippines, Portugal, Romania, Serbia, Switzerland, Turkey, Jordan, and Poland - from the AWS Certified list) with more to come in the upcoming years.

Implementing the Standard and achieving Certification allowed PMI to formalize its commitment to water stewardship principles, reduce its water footprint in manufacturing facilities and throughout its supply chain, engage with local stakeholders in a more robust, transparent, and cooperative way with the scope of raising awareness and synergically contributing to mitigating and addressing shared water risks and challenges. The implementation of the Standard framework has also led to the completion of annual global water-risk assessments with the scope of deep-diving into local, more granular scenarios for identifying hotspots of greater water-related vulnerabilities and prioritizing intervention to higher risk areas (Philip Morris International, 2022).

It would be difficult, if not impossible, to report all the results and best practices that have arisen and daily arise from each single PMI facility that has achieved AWS Certification. Consequently, we have decided to report a small array amongst the many global examples. Each Certified site has become, in their local catchment contexts, advocates for water stewardship with the scope of continuously improving their performances and outcomes. In the section below, we will discuss the performance of three PMI facilities: Philip Morris Manufacturing and Technology Bologna (PM MTB), in Italy, Philip Morris Polska S.A. (PMPL), in Poland, and the Philip Morris Philippines (PMFTC) facility in Marikina, in relation to the 5 AWS outcomes (Philip Morris Polska, 2021):

- Good Water Quality Status: Since 2021, PMPL is undertaking detailed investigations on the quality status of the groundwater, by implementing dedicated on-site tests. The scope is to monitor the quality status of the groundwater bodies on which the site relies upon for its water provision (Philip Morris Polska, 2022). PMFTC has also acted in safeguarding the water quality of its surface water bodies. In

collaboration with the local government, the Community Environment and Natural Resources (CENRO), neighbouring companies from an industrial complex, and a local NGO, PMFTC supported the installation of trash traps along a main river, the San Juan. Two of these traps, which help prevent surface water pollution, as well as blockages that may cause flooding, have already been installed by the local government. PMFTC and its community partners consulted third party engineers, who improved the design of the traps. Through a local NGO, the company also provided the infrastructure to install a third trash trap along the river and has plans to put additional ones in place (Philip Morris Philippine, 2022).

- Sustainable Water Balance: PM MTB has been investing in innovative water recycling and reuse technologies with the aim of reducing its potable water withdrawal. From 2019, approximately 29% of PM MTB's total water consumption comes from recycled waters. In 2021, PM MTB ameliorated its water consumption even further by optimizing its on-site wastewater treatment plant, resulting in an additional potable water saving of approximately 58,000 m^3. Furthermore, PM MTB is also continuing its investments in water consumption monitoring, which has reached a coverage of 100%. This has significantly contributed to the prompt identification of water losses and, consequently, to timely mitigation and corrective actions (Philip Morris Manufacturing & Technology Bologna, 2022).
- Good Water Governance: Since responsible water stewardship requires collective actions, PMFTC identified and engaged with key internal and external stakeholders, including employees and third-party workers, as well as local communities, academics, and regulators. To promote responsible water stewardship, PMFTC ran comprehensive awareness campaigns that included a webinar, in which local companies participated in round table discussions with leaders of local barangays (small communities or villages), a seminar for in-house contractors, and a water conservation art contest aimed to raise awareness within local communities. Extensive communications efforts across several digital channels and announcements on local bulletin boards complemented the awareness campaign (Philip Morris Philippine, 2022).
- Secure Important Water-Related Areas (IWRAs): To protect and maintain healthy ecosystems and important green areas, PMPL conducts annual tree planting programmes and has installed, over the years, beehives directly on-site. Forty-three trees have been planted between 2019 and 2021 to enrich the green areas within the site boundaries, thus also promoting bee pollination and the development of local biodiversity. Extensive campaigns with employees, for example in occasion of world earth day, have also been conducted to increase awareness and know-how regarding environmental preservation and sustainability. Such campaigns included the construction and installation of bird nesting boxes, to encourage the repopulation of bird species, the conduction of educational webinars on the urban animals found within the site premises, and the planting of herb gardens (Philip Morris Polska, 2022).
- Water, Sanitation and Hygiene (WASH): Access to water, sanitation, and hygiene is a key factor in the AWS certification process. To equip local communities, PMFTC has donated the first two handwashing facilities at Tanauan Vegetable Trading Post to provide residents better access to WASH facilities. PMFTC also implemented awareness campaigns on the importance of good potable water quality within the local communities (Philip Morris Philippine, 2022).

Based on the success stories and global results achieved to date, PMI will continue to implement a long-standing approach of sustainable water management and stewardship actions at an international scale. The scope will be to continue to engage stakeholders, identify and address water challenges, risks, and create catchment resilience, throughout PMI's supply chain and manufacturing operations.

The long-term objectives that PMI is striving to achieve through the implementation of sustainable management practices and the Standard framework, will be to save a total of 10 million m^3 of freshwater by 2030, address shared water challenges both in its tobacco and non-tobacco supply chain as well as in production activities, reinforce good agricultural practices, and improve current tools to better monitor and understand water volumes that need to be restored to achieve a net positive balance on-site and in the catchment (Philip Morris International, 2021a).

4. Conclusion

Applicability of the AWS Standard framework is structured in such way to fit and comply with any type of water user anywhere in the world. This flexibility permits the Standard to be implemented voluntarily by any organisation, even if not productive or water demanding, with the scope of formalizing a commitment and an implementation scheme for internationally recognized water stewardship practices.

By implementing the Standard and, consequently, water stewardship practices, water management is brought to another level by stepping outside of an organization's physical boundary and bringing into the picture various actions and actors such as stakeholders, water use in the supply chain, WASH and IWRAs, assessment of shared water-related challenges and resilient mitigation interventions to address vulnerabilities and ensure a long-term water security. Consequently, issues are address not only inside the site's physical boundaries but also directly on and with the catchment context through a stakeholder inclusive process.

The case study of PMI highlights how a multinational company can incorporate the Standard framework as an international ambition and

fundamental steppingstone towards the achievement of long-term sustainability goals in relation to water. The benefits and mitigation actions implemented by several PMI facilities following the water stewardship approach and the standardized framework given by the AWS Standard, allowed the companies not only to minimise their local water footprint, but also cooperate in a more robust, durable, and synergic way with their local stakeholders to manage and concretely mitigate shared water issues and challenges within the same catchment context. PMI's journey in water stewardship is still ongoing, but PMI facilities all over the world are on the right path to transforming the way that they deal with water.

The AWS and its water stewardship approach could potentially be the light at the end of the tunnel, an innovative, long-term solution to the widespread water crises that we all, sooner or later, will lean towards. We are seeing a significant transformation in a number of companies and organizations, but the hope is that many others will embark on this path toward a more sustainable future and security for water.

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