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# MAKING WATER YOUR BUSINESS

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COMPANY PERSPECTIVES  
FROM THE BALTIC SEA REGION

2014



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**Arjen Y. Hoekstra**

Professor in Water Management at the University of Twente,  
the Netherlands

# FOREWORD

Water is vital for life. Sustainable management of our water resources is key in maintaining a healthy Earth and securing long-term human well-being. Already since its inception, water has been a key focus for the Baltic Development Forum (BDF), initially driven by the poor state of the Baltic Sea. The current publication on water stewardship is a result of BDF's initiative to promote dialogue on wise water use within the Baltic Sea Region. I hope that this publication contributes to enhancing the awareness that better water management is an essential ingredient in the development of the region. It is encouraging to see that the Baltic Development Forum envisages a future in which sustainable water management and reduction of the water footprint where necessary is considered a vital element in a green growth strategy for the region.

We are living in a time in which economic crisis urges us to reflect on what we understand under economic progress. Human well-being, a healthy environment and economic stability are widely seen as critical values. A one-sided focus on growth of the Gross Domestic Product is to be regarded as something of the past. Real progress includes that care is taken for the house in which we live. Environmental protection is not a cost item on the budget but an objective in itself.

Eutrophication of water bodies in the Baltic Sea Region and pollution from toxic chemicals is widespread, due to insufficient infrastructure to treat communal and industrial wastewaters, oil spills and diffuse pollution from agriculture. Water pollution is not inevitable, it is a choice. It is encouraging to see that momentum is now there for a radical change. Worldwide, the demand for sustainable products is increasing. The Baltic Sea Region faces a challenge, but the knowledge and technology are there. If the public and private sector put their hands together, it is possible to create a regional competitive advantage by making production water neutral.

In the current publication, companies in the Baltic Sea Region share their experiences on water stewardship in general and the application of the water footprint concept in particular. The Coca-Cola Company was the first com-

pany in the world to assess the water footprint of one of their key products, so it is no surprise that this publication contains two contributions from this company, from the branches in Poland and Norway. We can also read about the efforts by the Finnish paper industry UPM, which was the first company in the global pulp and paper sector to explore its water footprint



Prof. Arjen Hoekstra receives the 2011 Baltic Sea Award at the 13th Baltic Development Forum Summit

and start formulating a response strategy. Another contribution comes from the Finnish food company Raisio, which was the first in the world to put a water footprint label on a product, to help consumers understand the relation between what they consume and water resources use. Yara reports on its interesting research on reducing water resources use and pollution per unit of crop production. Carlsberg shares its experiences with addressing water risks and public-private partnerships aimed at achieving environmental sustainability.

I hope that this publication will serve both as an introduction to the challenges we face and as inspiration for both public and private sector actors in the region. The future is in our hands. We all share in the responsibility to contribute to a prosperous and healthy Baltic Sea Region.

## Arjen Hoekstra

*Arjen Hoekstra is Professor in Water Management at the University of Twente, the Netherlands. He has led a variety of interdisciplinary research projects and advised governments, civil society organizations, companies and multilateral institutions like UNESCO and the World Bank. Hoekstra is creator of the water footprint concept and established the interdisciplinary field of Water Footprint Assessment (WFA), a research field addressing the relations between water management, consumption and trade. In 2011 Hoekstra received the Baltic Sea Award for his pioneering work in this emerging field.*





Photo: BDF

**Hans Brask**  
Director, Baltic Development Forum

# THE BALTIC SEA REGION: THE BEST PRACTICE REGION

From a European perspective, the Baltic Sea Region is unique in many ways. On all levels of society, it is characterized by a strong will to cooperate in developing and exploiting shared opportunities as well as to solve common problems. The Baltic Sea Region is on the “Top of Europe” in both geographical and economic terms, since growth in the region has been above the European average despite the severe economic and financial crisis during the past 5-6 years. The countries have shown a strong will and ability to overcome the economic challenges.

Part of the successes of the regional cooperation and the performance of the individual countries is – in my view – an openness to exchange best practice, mutual interest and inspiration as well

as knowledge and information sharing. Still we can and must do better. This especially goes for the environmental challenge present in the Baltic Sea.

Environmental concerns have always been a strong driver for regional dialogue in the Baltic Sea Region. The environmental issue was at the heart of the first important step towards regional cooperation: the signing of the Helsinki Convention in 1974. It recognized that the pollution of the Baltic Sea was a huge common problem and provided a basis for joint efforts to protect the marine environment. A revised second Helsinki Convention was signed in 1992 and a detailed Action Plan has been developed since.

Further steps towards increased regional dialogue has followed. Strong political initiatives were taken in the early 1990s to overcome the cold war division and to rebuild the Baltic Sea Region as a European macro-region. The Council of the Baltic Sea States (CBSS) was established in 1992. At the same time, many other initiatives have been taken and a large number of structures, organisations and networks has mushroomed based on cooperation between business communities, civil societies and regional and municipal authorities. Most recently, a strong link between regional cooperation and wider European structures was established through the EU strategy for the Baltic Sea Region.

Despite these steps, which have built upon and reinforced the natural penchant towards regional cooperation, the environment remains our biggest challenge. It is a disappointing fact that we have not been able to reach a satisfactory solution of our most serious environmental challenge - the poor health of the Baltic Sea. It is paradoxical in many ways. Firstly, because of the aforementioned inability to translate regional governance structures into decisive environmental action. Secondly, because the region hosts some of the greenest societies that boast of being world leading in innovation and clean-tech. We ought to be able to use this force of green and clean to the advantage of the Baltic Sea. We need a stronger comprehensive and holistic view of the challenges, involving a wider set of actors from both public and private sectors in order to overcome the paradox.

There are clear linkages between a healthy environment and economic growth. Degradation of the environment is a drag on economic development, and failure to safeguard the health of our freshwater and of the Baltic Sea means lost opportunities for business and for job creation.

We need well thought out cross-sector policies to make the best of this connection and encourage early movers towards innovative solutions. We need to continue to provide mutual inspiration and best available solutions. Studies show that we can do better in building regional research networks and obtain faster implementation of research results. We should find ways to strengthen our industrial clusters and attract more financing, including from foreign investors. Environmental challenges are a reality around the globe, and there is plenty of potential for exporting ideas and solutions developed and tested here to other parts of the world.

Among stakeholders in the Baltic Sea Region, there is also a strong wish to involve the private sector in finding these solutions, and policies and regulations are not the only measures to rely on. There are plenty of best practice examples of when the private sector have become front-runners, going beyond the legal requirements to drive the development of new sustainable approaches. This is what this report wants to demonstrate - what can be done by business and organisations, and how we can learn from different efforts that are made by companies on their own initiative. We want to present their own story and as you will see, it makes good sense and good business.

This report on corporate water stewardship is a contribution to improved cooperation in these important areas. Our future opportunities are closely related to our ability to protect the environment through carefully designed environmental policies and technical developments that promote business interest in solving these problems. Thus, this report might provide some of the answers on how to channel the best parts of regional cooperation and best practice behavior in the region into finding solutions for our environmental challenges of the Baltic Sea.

#### Hans Brask

*Hans Brask has been the Director of Baltic Development Forum since August 2007. His background is in international affairs, and he has a wide experience in Baltic Sea Region affairs. Hans Brask has been employed by the Danish Ministry of Foreign Affairs since 1990 and has served in Estonia, Latvia and Paris, and as embassy secretary at the Danish EU-representation in Brussels. Hans Brask has also taken part in the EU's negotiations with Russia on the Partnerships and the EU's external strategy towards the Baltic Sea Region and served as Head of Secretariat during the Danish presidency for the Council of the Baltic Sea States.*

## WHAT IS THE BALTIC SEA REGION?

Eleven states take part in the cooperation in the Baltic Sea Region. According to definition used by the Baltic Development Forum, the Baltic Sea Region consists of the Baltic countries Estonia, Latvia and Lithuania; the Nordic countries Denmark, Finland, Iceland, Norway and Sweden; Northern Germany (Hansestadt Hamburg, Mecklenburg-Vorpommern and Schleswig-Holstein), Northern Poland (Pomorskie, Warminsko-Mazurskie and

Zachodnio-Pomorskie), and Russia's Northwestern federal district including Kaliningrad. Almost 100 million people live in this region.

The Baltic Sea catchment basin covers an area of approximately 2 million km<sup>2</sup>, which is four times the size of the Sea itself and almost 20% of the European continent. The catchment area is home to 85 million people and 14 countries.



A photograph of a rocky coastline with blue water and a clear sky. The water is a deep blue, and the rocks are dark and jagged. The sky is a clear, light blue. The text is overlaid on a green rectangular background.

## THE BALTIC SEA

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is the world's largest body of brackish water. It is connected to the ocean waters of the North Sea only through the narrow and shallow straits between Denmark and Sweden. The slow turnover of water make the Baltic Sea particularly vulnerable to eutrophication, because nutrients discharged to the sea will remain in the basin for a long time. The latest assessments carried out by Helcom categorize the entire Baltic Sea as being eutrophied. Eutrophication leads to oxygen depletion, resulting in dead seabed. It is estimated that the dead zones together make up an area the size of one and a half Denmark.

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Photo: Kalundborg Forsyning

**Hans-Martin Friis Møller**  
CEO, Kalundborg Utility

# WHAT IS WATER STEWARDSHIP?

Next to the air we breathe, water is the world's most important resource. Yet, many of us have taken the widespread availability of water for granted, particularly in developed countries. Water scarcity is already an issue in many emerging economies. On the 22th of March 2014, World Water Day, a report published by the Carbon Disclosure Project, "Safeguarding Europe's Water Resources" states that for an increasing number of European companies, water already has and will continue to have a profound effect on both short term and long-term profitability.

The real value of water to a business exceeds its cost, especially when looking on the value chain, from sourcing and manufacturing to distribution and end use of consumption. However, water is the only resource or raw material, which is not priced at the stock market.

In principle, water has no price in areas with little or no water stress. Here water is considered a given resource. In areas with high water stress, water tends to be a more valued resource. At the Global Green Growth Forum in Copenhagen in 2013, this was considered the major obstacle to financial investments in undeveloped countries to reduce non-revenue water, despite the good business case of reducing water losses. The value of water has to be set by other standards, and one such standard is water stewardship, which can serve as a helpful tool in addressing the global water challenges that we are faced with.

## OUR CURRENT GLOBAL WATER CHALLENGES:

- **41%** of the world's human population live in areas of severe water stress.
- **800 million** people lack access to safe drinking water.
- **2.6 billion** lack adequate sanitation services.
- **Water pollution** is high, especially in developing countries where up to 70% of industrial wastewater is discharged without treatment.
- **Effects of climate change** will exacerbate water problems and lead to changing and erratic rainfall patterns, droughts and floods.

These challenges will grow further as a result of three megatrends:

- The world's population is expected to peak at 9 billion by 2050. Already in 2025, 65% of the world's population and 1/3 of the land area will be in severe water stress due to additional food and water requirements. Most of the 3 billion additional people will live in cities in the developing world with poor water and

sanitation infrastructure. Water scarcity leads to increased potential for conflicts.

- *Temperature increase of 1-2 degrees by 2050: Climate change results in higher weather variability, less freshwater stored in ice, more droughts and floods, and changes in the ecosystem due to higher water temperatures.*
- *More than 50% of the world's population live in cities and the number of megacities will grow rapidly. Urbanization and rising incomes, especially in BRIC countries, lead to changing consumption patterns. To feed the larger and richer population a near doubling of water for irrigation is needed and will result in higher per capita water requirements, especially through shifts in demand for different types of food.*

In order to face up to these challenges, governments have to put more focus on sustainable water use to ensure that our society can continue to benefit from fresh water usage while maintaining humans rights and healthy ecosystems. Companies and NGOs are also making committed efforts to finding ways to introduce sustainable water management systems such as water stewardship.

## WHO IS ADDRESSING WATER STEWARDSHIP?

Several companies have put water stewardship at the top of their agendas. They are doing it because it gives a triple bottom line, product value, stakeholder value and branding value. It is obvious that the food and beverage industries should focus on water stewardship, but more and more other industries are also finding this important as water has a crucial role in a wide range of industries, products and processes - from agriculture to pharmaceutical manufacturing, from mineral extraction to textile production and many more.

As an introduction to the water stewardship approach, all companies need to ask themselves five basic questions:

- How important is water to our company?
- How would we operate without water or with inconsistent supplies of water?
- Can we operate in a changing climate situation such as flooding?
- How might our water management affect our brand value?
- How might increased global demand or risk for water create business opportunities?



**Hans-Martin Friis Møller**

*Hans-Martin Friis Møller is director for Kalundborg Utility, the only utility in Denmark operating with different water qualities to different purposes and a resource sharing system, the Kalundborg Symbiosis. He has more than 20 years' management and project experience encompassing a wide range of water, energy and environment issues, from groundwater control to infrastructure management and wastewater treatment. Hans-Martin Friis Møller is also part of the international work on developing an ISO standard for the water footprint concept.*

At the heart of water stewardship lie the principles and criteria for responsible water use. These principles have now been agreed upon in the Alliance for Water Stewardship, through a multi-stakeholder round-table process in which economic, environmental and social interests have been balanced and reconciled. The aim is to define the highest possible standards of responsible practices for their water use and to enable companies that meet those standards.

**MAKING A STRATEGY FOR WATER STEWARDSHIP**

An effective water stewardship strategy keeps stakeholders, local communities and employees engaged in the stewardship activities. WWF has designed a water stewardship step-by-step approach to help guide any Water

Stewardship strategy. The steps are not meant to be linear in the sense that companies make a graduation between the steps as they evolve in their thinking and experience. Instead they are an iterative process of learning, acting, doing and improving. Lastly, not all companies will take this journey. Depending upon the sector, their risk, their ambition etc., they may work at certain parts of these steps.

The companies in the Baltic Sea Region have a unique position to engage in water stewardship practices, through the high approach towards sustainability and environmental standards. Managing water risk not only in the Baltic countries but in branches worldwide will make the companies more attractive for investors and their products more competitive.

# FIVE STEPS TOWARDS WATER STEWARDSHIP

**1. WATER AWARENESS**

Gaining an awareness of water issues - in terms of how water impacts business and how business impacts water - is an on-going and iterative step for all companies. It is also an important aspect to include effects from climate change, i.e. the risk of flooding. A key facet of awareness is internal engagement. From the CEO level to plant managers and suppliers and employees, building awareness can help companies 'sell' the water story within to elicit action where it matters. Water awareness can also highlight how a company is perceived

by others, including basin stakeholders, the press, and consumers, which in turn influences the degree of risk that a particular company faces. External debates and their sector-specific implications will inform a company's understanding of water and its associated risks, and will influence strategy and interventions.

At its most basic, water awareness must include a high level of understanding of the global water challenges, the dependence a company has on freshwater and their exposure to water-related risks.

**2. KNOWLEDGE OF IMPACT**

Impact refers to the wider understanding of where a company's 'water footprint' is actually located in terms of direct (company operations) and indirect (supply chain) water dependencies. It includes determining the volume of water used to produce a specific product within a specific geographic location, across the entire value chain. This generally includes measuring elements of water use, as well as an estimation of 'impact' on water resources. In this step, many companies begin

to look beyond the fence line of their operations to understand the wider context of their water use, including global debates, peer examples, and relevant watershed issues.

Hot-spot and risk analysis can help drive understanding of these impacts. These assessments should include the 'context' of the basin, as well as the identification of high risk 'hot spots' caused by water quantity and/or quality issues.



### 3. INTERNAL ACTION

Internal action implies that some element of learning and prioritisation has occurred and a strategy is in place. For most companies, this is the more comfortable first step of getting one's own house in order by outlining goals, targets, actions, and plans that will help tackle the more immediate solutions to the problem - the low-hanging fruit. Internal action tends to incorporate the following crucial activities: company targets to reduce baseline water use; launch of water efficiency pilot projects; engagement

with employees, consumers and marketing to address opportunities and risks; improvement of water quantity and quality reporting; and pollution prevention.

This is also the step where companies begin engaging with their suppliers and assess how to take action to realize supply chain improvements through alternative sourcing, product innovation, or improved management of water in the production of raw materials.

### 4. STAKEHOLDER ENGAGEMENT

In this step, a recognition that working with others and at various scales (global fora to local water groups) is a necessary part of a robust water stewardship strategy. Engagement with stakeholders where company water use and associated risk is high can help mitigate basin-related risks, boost reputation on water issues, and build brand trust and loyalty. Stakeholders can be anyone from other users in a particular watershed, to other companies, NGOs, sector initiatives, public agencies, and standard-setting bodies.

Stakeholder engagement can take the form of participation in public fora to address water management issues, support for freshwater conservation projects in watersheds of importance to company operations, partnerships with watershed groups, NGOs or other companies that pool technical, human, and financial resources to conserve and improve freshwater resources, or participation in collective actions to improve water management such as the effort currently under way to develop and promote a global standard for water stewardship.

### 5. INFLUENCE GOVERNANCE

Depending on the sector and their exposure to risk, this step can be one of the trickiest for companies. This is also where engagement can bring about higher risk, but is nonetheless a course of action which requires careful planning and thought.

The motivation for engagement usually stems from circumstances of direct impact to a company and will often consist of advocacy, influencing or lobbying, partnership, financial support, facilitation, institutional strengthening, etc. It may take place at the local, watershed, state or national level.

In some places, companies may choose to use this strategy if risk is high or the imperative for better management from public authorities is seen as a future risk. Most engagement activity will depend on the sector and their ability to influence, whether or not they are a strategic partner of government (energy, water provision) or if they are a manufacturer of goods. The opportunities through engagement can mean a significant loss of risk, including social and legal license to operate and clearer and consistent laws and regulations that govern company water use.



Photo: Peter Tvärberg

**Lovisa Selander**

Head of Water and Environmental Affairs, Baltic Development Forum

# SUSTAINABLE WATER MANAGEMENT, SUSTAINABLE BUSINESS

More or less any sector of business is dependent on water in one way or another. Some companies and sectors of business use water directly in their operations: The food and beverages industry need it as an ingredient, and manufacturing use it for rinsing and cooling. For other sectors of business the link to water resources may be more indirect, such as for the textile manufacturer that is not only using water for dyeing cloth, but is also highly dependent on rainfall on the cotton fields from where the raw material comes.

While government regulations form the bottom line for a company's water use and impact, there are other aspects for a company to consider in relation to their water use. Consumer perceptions, supply chain demands and the need for securing long-term access to water of sufficient quality to sustain production are some of the additional factors that together make up the real value of enforcing good water management practices – and dictate the costs of failing to do so.

## MITIGATING WATER RELATED RISKS, OPTIMIZING OPPORTUNITIES

Most companies have strategies related to corporate responsibility and the environment. More and more are developing specific strategies and goals related to water - not only because responsible water management is part of the wider sustainability agenda, but also because of the realization that not addressing water comes with a risk. The business related risks associated with water are commonly divided into the following categories:

- **Physical risk** occur when production cannot be sustained due to shortages of freshwater of sufficient quality in the supply chain or in the direct operations. Physical risk can also occur as a result of too much water; e.g. when flooding occurs.
- **Reputational risk:** The company brand can suffer damage when other actors start to doubt whether the company has the will and/or capacity to properly address issues relating to sustainable and equitable water use.
- **Regulatory risk:** Failing to comply with governmental control and regulation in the area of water use.
- **Financial risk:** Failure to address the different water related risks may translate into increased costs and/or reduced revenues.

Companies that are pro-active in addressing their water use and impact can avoid costs and reputational damage and gain competitive advantages. On a strategic level, benefits include securing legal and social licenses to operate in a specific location, building the capacity to prevent or manage operational crises that result from inadequate supplies of good quality water, and building trust among current and potential investors and consumers.

## ADDRESSING WATER IN DIRECT OPERATIONS

Reducing water use and impact stemming from a company's direct operation is relatively straightforward, and is generally achieved by reducing, recycling and treating. There are plenty of technologies available to help "close the loop" in processes, which means water can be recirculated and reused. When less wastewater is discharged, the ecological capacity of the local basin is safeguarded, ensuring future supply. As wastewater discharges in most places come with a fee, decreasing volumes also means money saved.

Saving water also means saving energy. Smaller volumes of water means less water that has to be transported, heated, cooled or treated – actions which all require energy. Pumping water requires large amounts of energy. Globally pumps alone consume 10 percent of the world's electrical energy, and most of what they are pumping is water.

## ENGAGING WITH SUPPLY CHAINS AND BASINS

Most companies have the largest share of their water footprint not in their own operations, but in their supply chains. Thus, addressing how water is managed in the supply chain could prove an effective method for decreasing a company's overall water impact. Tools such as water footprint assessments can help map where the weak points are and where steps should be taken. However, implementing actions outside the direct operations may be more difficult to achieve since it includes dealing with issues partly beyond the company's own control.



Addressing water in the supply chain could involve including certain standards related to water in agreements with suppliers, or use criteria related to water management as a factor when choosing between several suppliers. By setting targets for water use and engage in benchmarking, product labelling, certifications and reporting, a company will build capacity on water management and improve their operations. These actions also increase transparency, which in turn can aid dialogue and build trust in the relationship with both consumers and suppliers.

In addition to the supply chain, there are other external factors to consider. A business does not operate in isolation but is part of a wider water cycle and basin. It is important to ensure that enough water is left for other stakeholders in the basin, and that downstream actors are not impacted by pollution. While the bottom line is to adhere to local water use rights and licenses, there are benefits to have by engaging in dialogue with local and regional institutions, and take part in community partnerships and project. Unsustainable watershed conditions outside of the company fence lines, such as water scarcity, pollution, or weak water governance bring considerable business risks. Making conscious decisions on where facilities are located based on the water characteristics within the particular basin can significantly cut down on water risk levels.

## WATER STEWARDSHIP IN THE BALTIC SEA REGION

In the Baltic Sea Region freshwater of good quality is generally abundant. However, we cannot expect that to be the case in the future. Moreover, many companies in the region also operate in other areas of the world. Just as our water footprint extends beyond the regions' borders and impacts conditions elsewhere, it is crucial to apply a responsible approach to water management throughout the operations. In the Baltic Sea Region environmental awareness is generally high, and is also home to many companies that are regarded as front runners in green solutions. Showing a will to cooperate with authorities, a good track-record and the establishment of pro-active strategies and responsible resource use could help land the license to operate elsewhere where water resources may not be as abundant.

Water management is not only about saving water volumes. It is also very much about being responsible about the impact you have on the existing water resources. In the Baltic Sea Region pollution is a severe challenge, not the least in relation to the Baltic Sea where industry has an important role to play in order to curb the transport of nutrients and hazardous substances. In this basin one actor's activity impacts another, and water and nutrient management must be addressed in a holistic perspective, from source to sea.

### Lovisa Selander

*Lovisa Selander is Head of Water and Environmental Affairs at the Baltic Development Forum, responsible for BDF's wide range of activities related to water stewardship, sustainability and blue growth in the Baltic Sea Region. Lovisa Selander has previously worked on international policy development, communications and advocacy on water related issues at the Stockholm International Water Institute (SIWI), and took part in UN Climate Change Negotiations 2009-2013. She has a background in water engineering and journalism.*



## ASSESS, ADDRESS AND ADVOCATE:

# WATER TOOLS AND PLATFORMS

*For companies looking to evaluate their water use and find ways of minimizing their environmental and social impact connected to water there are several tools available, as well as networks and platforms for building capacity and influence decision-making. Most of these have been developed for a global audience and are relevant for companies worldwide, but they also offer the opportunity of examining the local context of a specific basin.*

## GETTING AN OVERVIEW AND ASSESSING POTENTIAL RISKS

### WBCSD Global Water Tool

The Global Water Tool allows companies and organizations to map their water use and assess risks that may affect their global operations and supply chains. By comparing a company's location with available water, sanitation, population and biodiversity information on country and watershed level, the Global Water Tool:

- **Establishes** relative water risks in a company's portfolio in order to prioritize action
- **Creates** key water reporting indicators in addition to inventories, risk and performance metrics
- **Generates** maps, charts and tables summarizing results
- **Enables** communication with internal and external stakeholders

The Global Water Tool is a free online tool consisting of an Excel workbook for site location and water use data entry. It features an online mapping system enabling users to plot their sites with external water datasets, and is linked to Google Earth to provide spatial viewing of a company's site location in relation to detailed geographic information, including surface water and population density. As such the Global Water Tool can help provide companies operating in multiple countries with very different water contexts make water informed decisions. In addition, WBCSD has developed the Local Water Tool™ (LWT), which can provide specific guidance on the local situation at specific sites.

The tool was developed by the World Business Council for Sustainable Development (WBCSD) in collaboration with its members, The Nature Conservancy and the Global Reporting Initiative.

Source: [www.wbcd.org](http://www.wbcd.org)

### WWF Water Risk Filter

The WWF Water Risk Filter can be used for companies to assess water related risks that are derived from their own operations, from their suppliers or from growth plans. The results can also be used to make strategic long term decisions related to the supply chain. The

results of the risk assessment and the provided possible mitigation responses provide guidance on where to focus, including actions and programmes that can be initiated with suppliers or together with other companies.

Designed for non-water experts, the Water Risk Filter provides a structured set of risk indicators and requires only limited information to be entered. The Water Risk Filter covers all elements of water related risks that can have a financial impact on the user, all industries and all countries of the world. It interprets available scientific data and translates it into risk numbers, and allows for mapping the assessed facilities or investments on water related map overlays. By providing a structured set of responses and up-to-date case studies it serves as a good first step towards mitigating risk and develop a water stewardship strategy. For an investor or creditor the risk assessment can help identify potential risks for the client, contributing to increased return on investment.

Source: [waterriskfilter.panda.org](http://waterriskfilter.panda.org)

### Aqueduct Water Risk Atlas

Aqueduct, developed by the World Resources Institute (WRI), helps companies, investors, governments, and other users understand where and how water risks and opportunities are emerging worldwide. The online mapping tool allows users to combine 12 key indicators of water risk in 15 000 watersheds around the world, to create global overall water risk maps.

The Aqueduct Water Risk Framework brings together indicators into three categories of water risk: physical risk related to quality and quantity, reputational and regulatory risk, and an overall aggregated score. It is structured to help companies and investors understand indicators of water-related risk to their business, but is intended for all users, including government and civil society to better understand geographic water issues. Users can plot the locations that matter most to them – facilities, suppliers, etc. – and compare water risk levels between sites.

Each water risk indicator can be weighted to determine how much influence that indicator has on the overall water risk map. Default sets of weights for major industry sectors are provided. In 2014, Aqueduct will add maps projecting long-term change in water stress due to population growth, economic development, and climate change. WRI will also evaluate water-related risks to shale gas development worldwide, and explore satellite remote sensing to evaluate water risks in real time.

Source: [www.wri.org](http://www.wri.org)

## UNDERSTANDING AND ADDRESSING THE SUPPLY CHAIN

### Water Footprint Assessment

The Water Footprint Assessment Tool, developed by the Water Footprint Network, is a free online web application assisting users in water footprint quantification, sustainability assessment and response formulation. It has been designed for the use of a wide set of actors: companies, governments, NGOs, investors, consultants, or researchers. The tool allows users to explore the water footprint in a certain basin or sector; find out where there is water scarcity; quantify and map water footprints of operations, supply chains, facilities or products; assess the sustainability of a facility's or product's water footprint and identify ways to reduce it.



The Water Footprint Network has also published a Water Footprint Assessment Manual, which provides a complete overview of the global standard on water footprint assessment. The manual provides a comprehensive set of methods for water footprint assessment as well as examples of how green, blue and grey water footprints can be calculated for individual processes and products, consumers, nations and businesses. In addition, it describes how to assess the sustainability of the aggregated water footprint and lists possible measures that can contribute to water footprint reduction.

Source: [www.waterfootprint.org](http://www.waterfootprint.org)

## WATER STEWARDSHIP STANDARDS AND CERTIFICATIONS

### Alliance for Water Stewardship, Water Stewardship Standard

The AWS International Water Stewardship Standard (AWS Standard) is designed to be an international, ISEAL-compliant, standard that defines a set of water stewardship criteria and indicators for how water should be stewarded at a site and catchment level in a way that is environmentally, socially, and economically beneficial. The Standard provides water stewards with a six-step continual improvement framework that enables sites to commit to, understand, plan, implement, evaluate and communicate water stewardship actions.

The AWS Standard can be implemented by any site or sector and in any basin, and can be used by actors interested in mitigating corporate risks, such as water-related supply chain risks or investors, and public sector agencies as a framework to evaluate water stewardship practices.

The AWS Standard is free to download, and will be supported by a capacity building programme and a verification system which will recognize the different levels of performance outlined in the AWS Standard and will offer independent verification of performance developed by members. The AWS Standard is managed by the members of the Alliance for Water Stewardship and informed by a technical advisory group. AWS works with partners around the world and other water stewardship initiatives such as the CDP questionnaire, the CEO Water Mandate's Water Action Hub, WWF's Water Footprint Assessment and WWF's Water Risk Filter to ensure local relevance, interoperability & alignment. The AWS system is aligned with the European Water Stewardship system.

Source: [www.allianceforwaterstewardship.org](http://www.allianceforwaterstewardship.org)

### European Water Stewardship Standard

The European Water Stewardship (EWS) aims to help European businesses to assess, verify and communicate responsible water stewardship practices. The EWS standard is the result of an international, multi-stakeholder process. Assessing performance through a number of defined criteria and indicators, the standard addresses physical, reputational and regulatory risks linked to water management in accordance with four principles:

- **Achieve** and maintain sustainable water abstraction in terms of water quantity.
- **Ensure** the achievement and maintenance of good water status in terms of chemical quality and biological elements.

- **Restore** and preserve water-cycle related High Conservation Value areas.
- **Achieve** equitable and transparent water governance.

The certification process includes an independent third-party approval, and users can communicate their water management improvements through different levels of certification: bronze, silver and gold.

The European Water Stewardship (EWS) is a program of the European Water Partnership dedicated to advancing Water Stewardship around Europe, and to achieve compliance with regulatory measures set out by the EU in the Water Framework Directive and the Blueprint 2012.

Source: [www.ewp.eu](http://www.ewp.eu)

## COMMITTING AND ADVOCATING

### CEO Water Mandate

The CEO Water Mandate is a public-private initiative established by the UN Global Compact and endorsed by global companies from a variety of industry sectors, designed to assist companies in the development, implementation, and disclosure of water sustainability policies and practices.

Endorsers of the CEO Water Mandate recognize that through individual and collective action they can contribute to the vision of the UN Global Compact and the realization of the Millennium Development Goals. The CEO Water Mandate holds periodic working conferences that convene endorsing companies and stakeholders from the public sector, civil society, academia, and other sectors to discuss water challenges and identify practical solutions.

Source: [ceowatermandate.org](http://ceowatermandate.org)

### Baltic Sea Action Group

For stakeholders seeking to enhance action specifically towards improving the health of the Baltic Sea, the Baltic Sea Action Group (BSAG) can serve as a platform for engagement. BSAG collects voluntary commitments from businesses, organisations and nations for an act or a process with a positive impact on the wellbeing of the Baltic Sea. All Commitments are made public, their progress is monitored regularly by BSAG and is evaluated by a third party.

BSAG is an independent non-profit foundation based in Finland which seeks to act as an initiator and catalyst behind concrete acts aimed at tackling challenges to the Baltic Sea, such as eutrophication, threats imposed by hazardous substances, and risks related to maritime activities. In particular, BSAG seeks to inspire the business sectors to get involved and utilize its innovative skills to solving the problems relating to the state of the Baltic Sea.

The work is based on cooperation among all levels of society – politics, public authorities and the private sector – in all the Baltic Sea countries. BSAG follows the HELCOM's (Helsinki Commission for Protecting the Baltic Sea) Baltic Sea Action plan.

Source: [www.bsag.fi](http://www.bsag.fi)

# THE WATER FOOTPRINT

The water footprint visualises how much water has been consumed or polluted when producing a certain product, accounting for the water impact throughout the entire in the production chain. It also shows the location where the consumption or pollution has occurred, thus enabling companies to see where their water use has an impact.

Water footprints can also be calculated for individuals, communities, nations or businesses. In those cases the water footprint is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community, or as the water volumes connected to the business' direct operations and supply chain.

*Examples of global average footprints for products:*

Beef, 1 kg:

**15415** liters

Chocolate, 100 g:

**1700** liters

Coffe, 1 cup:

**132** liters

T-shirt:

**2495** liters

*A water footprint consists of three components:*

## BLUE WATER FOOTPRINT

The volume of freshwater consumed from surface or groundwater sources.

## GREEN WATER FOOTPRINT

The volume of rainwater evaporated or incorporated into the product, e.g. consumed by a crop.

## GREY WATER FOOTPRINT

The volume of water that is required to dilute the effluents from the production process in order to bring the concentration of pollutants down to such a level that relevant water quality standards are adhered to.

Globally the green footprint is the fraction that accounts for the largest volumes, meaning that in an overall perspective, agricultural products stand out as the most water intense products. Out of the global water footprint, about 85% is accounted for by agriculture, 10% by industrial products and only 5% can be derived from domestic water consumption.

For most businesses, the supply-chain water footprint is much larger than the footprint that derives from their own operations.

Source:  
Water Footprint Network



# BUSINESS PERSPECTIVES FROM THE BALTIC SEA REGION: KEY MESSAGES

*Addressing water in a business context could take on a number of forms – from implementing new technologies to curb water use in processing, to embarking on partnerships with actors in the supply chains and communicate water footprint through product labelling.*

*We invited a number of companies in the Baltic Sea Region to share their approaches and experiences, the tools and strategies they have used and the advice they would like to pass on to others. As is evident from the articles presented on the following pages there is not one tool or concept that tells the whole picture, no “one size fits all”. However, there is a strong consensus that being pro-active in water management makes good business sense.*

The companies were asked to shape their texts around the following questions:

- What prompted you to look into your water use and impact?
- What were your main findings?
- Did you choose to use any particular platforms, tools and concepts?
- In what way did your local context (city, country, Baltic Sea Region) influence what approaches or strategies you chose to focus on?
- What goals have been set, what progress has been made, and what have you learned along the way?

## KEY MESSAGES:

*Without water there is no business: We have to make sure we manage it responsibly.*

*Responsible water management makes good business sense – it ensures the long-term sustainability of operations. Mapping water use and acquiring in depth knowledge on water management strategies help mitigate risk.*

*Saving water saves money: It means less energy is consumed and less wastewater has to be discharged.*

*Being proactive in water management helps build good relationship with authorities, consumers and with the wider community.*



Photo: Lovisa Selander

*Communicating water stewardship builds trust with consumers and could serve as a tool for dialogue.*

*Companies are increasingly collaborating with external actors – engaging in dialogue with the actors in the supply chain, with decision-making, external water expertise and local organisations - in order to be able to make more informed decisions on their water management.*

*In order to successfully implement water stewardship actions it is crucial to build awareness among, and involve, the employees.*

*Companies are moving beyond legal compliance. As business sector actors engage with the wider community and implement water management frameworks across their sites they become a driving force in the development of new concepts, tools and strategies.*

*There is not one tool or concept that has all the answers. However, in trying them out much can be learned about the supply chain and water availability in the basins where sites are placed.*

*While there is a high level of environmental awareness and of water stewardship performance in the Baltic Sea Region, the knowledge and performance is not evenly distributed. More can be done to share experiences within the private sector in the Baltic Sea Region.*

*There is a realization that water management is not only a factor in the overall work on CSR or sustainability but a strategic issue that can bring business benefits and competitive advantages. Thus, it is time for addressing water on a new level beyond the traditional water managers, making it a topic for CFOs and others involved in financial and strategic decision-making.*







# ADDRESSING WATER MANAGEMENT IN THE PULP INDUSTRY, IN OWN OPERATIONS AND BEYOND

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Interview with **Jesse Rep,**  
Environmental Manager at UPM, Finland

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# UPM

**Country:** Headquarters in Finland, production in several locations in the Baltic Sea Region and globally

**Sector:** Bio, paper and forest industry

**Employees:** 21 000 people

In UPM's work on sustainability, water has been identified as a strategic issue. This is both due to the importance of proper water management to ensure overall sustainability, and due to water being a key resource for UPM's operations as it is used both in the production process itself and for cooling. Over time, UPM has extended their water management from their own operations to also engage with the supply chain and the local basins.

In 2008 UPM set a number of long-term environmental targets in which they committed to reduce their waste water volumes with 15% and their COD (chemical oxygen demand) load by 20% by 2020. Over the last ten years, UPM has decreased their water use per tonne of paper by 31%, and by 28% per tonne of pulp produced.

## THE WATER FOOTPRINT OF PAPER

UPM has monitored their water use for both quantity and quality for a long time, with the aim of improving water management within their own processes. While water management in their supply chain was also monitored to some extent, it was the water footprint concept that opened the door for them to engage more actively with that aspect of water stewardship. The starting point for UPM's work in water footprinting was a study published by

the water footprint concept and get some insights into how they would be able to answer questions around it. The study, which was carried out in collaboration with the Water Footprint Network, looked into the Nordland paper mill in Germany and was presented in 2011.

*"We took it as a challenge to check if these figures made sense and to investigate how we manage water. The study did not only look at the direct operations at the paper mill, but true to the water footprint concept the supply chain and the forestry aspects were included as well, so it provided us with a good opportunity to research the whole production chain of paper," says Jesse Rep, Environmental Manager at UPM Finland.*

The results showed that the total water footprint of one A4 sheet of wood free uncoated paper is 13 litres, and for wood free coated 20 litres. The green, grey and blue water footprints make up 60%, 39% and 1% respectively. Approximately 99% of the water footprint originates from the raw material supply chain and the remaining 1% from UPM Nordland Papier's production processes.

**” There is not only one tool or concept that can provide all the answers. From our side it has been a matter of testing them, trial and error. They all provide different clues and certain indications, which put together can provide answers to our target of using water responsibly.**

The study confirms that the blue water footprint in the production chain of paper is small and occurs mainly from evaporative losses in the drying processes. Although this is indeed a water loss at a local level, in a wider perspective this evaporated water becomes part of the global water cycle and will eventually be available again for other purposes. The blue water volume used in the paper mills is taken from local water sources. After having been put through the UPM production process the water is treated and released back into nature.

Realising that figures alone do not tell the whole picture, UPM felt the need to go beyond the water footprint framework to look at how those volumes were managed – ultimately assessing the sustainability of the process. This was important not only to get



Photo: UPM

Prof. Arjen Hoekstra in 2009, which contained calculations of the water footprint of copy paper. UPM decided to attempt to verify these figures by carrying out a study on one of their own paper plants. In the process they were also hoping to learn more about





Photo: UPM

a complete understanding of their own processes, but also in order to be able to provide clear answers to their stakeholders. Therefore, they chose to include a sustainability framework in the study, which allowed them to carry out an assessment of the impact of their water use. This process involved mapping the available water resources in the relevant basin. They also went back to older records to assess how their performance had improved over time, both with regards to water quantity and quality indicators.

UPM experienced another limitation of the water footprint concept, namely the definition of the green fraction of the footprint, which states that water that is used for the growth process of trees counts as consumption of water. Contrary to irrigated agriculture, which involves redirecting water from one area to another, the trees making up the raw material for UPM's products are part of the natural water cycle and UPM has no direct control over the water that goes into it.

## THERE IS NOT ONLY ONE TOOL

In addition to the water footprint study, UPM has carried out water risk mapping with the World Business Council for Sustainable Development (WBCSD) Global Water Tool, and has carried out a pilot study at the Hurth Mill in northern Germany together with the European Water Partnership (EWP) using the European Water Stewardship standard. The EWP audit results show excellent compliance for all indicators and the UPM Hurth mill could opt for EWS certification.

The European Water Stewardship standard was perceived as useful, not the least since it provides a certification that does not only assess the level of your own water management performance, but also explains and communicates it to others.

*"There is not only one tool or concept that can provide all the answers. From our side it has been a matter of testing them, trial and error. They all provide different clues and certain indications, which put together can provide answers to our target of using water responsibly."*

Currently, UPM is using several different tools, platforms and certifications within their work on sustainability. As water is one of UPM's strategic areas, an effort is made to pick environmental labels and certification systems with strong water criteria.

## ADDRESSING WATER IMPACTS BEYOND THE DIRECT OPERATIONS

Large volumes of water are needed in order to produce paper and pulp. Consequently, most of the world's paper production is located in water rich areas such as Scandinavia and Northern Europe.



Photo: UPM

The water footprint of an A4 sheet of paper produced at the UPM Nordland Paper Mill in Germany is 13 litres.





Photo: UPM

*“Water plays a crucial role in our production. Without water we cannot produce, it is that simple. So we need to manage our water responsibly and understand our processes in order to have a positive impact on local water resources.”*

There are also more direct benefits associated with responsible water management. If in the future production was to be established in water-scarce regions, a good track-record on water management could help land a license to operate also in those regions.

**” Without water we cannot produce, it is that simple. So we need to manage our water responsibly and understand our processes in order to have a positive impact on local water resources.**

Jesse Rep recommends initiating a dialogue with the supply chain, investigate where there is a need to address water issues within it, and initiate a project together with the relevant stakeholders.

*“If your supply chain is using water unsustainably, it has an impact on you. Your customers need to be able to feel good about the product they are getting from you, and they in their turn need to be able to answer the water related questions that they might get.”*

However, Jesse Rep points out that finding the best ways of communicating your water use to the general public remains a chal-

lenge. Contrary to carbon which has a global environmental impact, water has a local impact, making the communication on water volumes and footprints very context specific.

## START SMALL, AND INVOLVE OTHERS

Jesse Rep's advice to companies that are looking to start developing their own water management strategies would be to start small.

*“Measure the water that goes into your processes, measure what comes out. Set a plan, strategy and goals taking into account the catchment in which you are operating. If you notice that you are not using water sustainably you need to come up with actions. Then move on to your supply chain and communicate to them that water is a priority to you and ask for their help in addressing these issues.”*

While all companies may not have the resources to build in depth internal capacity on these issues there are always external partners to team up with for expertise and support.

*“I believe that companies that have the resources and the strategic priorities in place to take the lead and show what is possible also have a responsibility to show the limitations of the projects, tools and concepts available, and communicate those so that others do not waste time and money. UPM has now built a lot of knowledge on responsible water management and on other environmental issues, and this helps when we talk to our stakeholders, supply chain and customer base.”*



# THE IMPORTANCE OF CARBON AND WATER FOOTPRINT ASSESSMENTS IN ECONOMICALLY SUSTAINABLE BUSINESS

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**Aki Finér,**

Specialist, Sustainability and Green Economy, Raisio, Finland

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# RAISIO

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**Country:** Headquarters in Finland, production in Finland, Poland, Czech Republic and the UK

**Sector:** Food, plant-based nutrition

**Employees:** 1 900 people

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In 2008 Raisio Group redefined its vision and strategy after several difficult years in business, making sustainability a central focus. The new vision pointed out that Raisio should be “a forerunner in healthy, ecological snacks with leading brands, and an active developer of the sustainable food chain”. During the six years that have passed since, Raisio has worked to further understand the environmental burden of the company supply chain, e.g through life cycle assessments, including carbon and water footprint assessments. Meanwhile, the company has seen a consequent improvement of profits. By identifying sustainability hotspots through life cycle assessments, Raisio has focused on reducing raw material and energy losses, on increasing recycling, and helping contract farmers cultivate grain in a more sustainable and efficient way. Raisio is also involved in several research and development projects with stakeholders to reduce environmental effects and to increase efficiency in the supply chain. We see that just tuning our own operations is not enough to create a more sustainable food chain, because most of the environmental effects occur in other parts of the chain.

## CLOSE COOPERATION WITH FARMERS TO DEVELOP MORE ECONOMICALLY AND ENVIRONMENTALLY SUSTAINABLE AGRICULTURE

Through contract farming, Raisio has been able to engage in close relationship with farmers, guiding them towards more sustainable cultivation, and introduce new grain varieties, cultivation techniques and farming supplies. Farming is economically under great pressure in Finland, and increasingly strict environmental requirements are set for conventional farming.

*“Working with the water footprint methodology has been important for us: we have learned to understand the issues concerning fresh water availability and water stress abroad.”*

Together with stakeholders Raisio seeks to provide solutions for Finnish farmers that are more sustainable from both an economic and environmental perspective.

Since 2008, Raisio has collected data on farm operations from contract farmers in order to evaluate the energy and environmental efficiency of farming practices. First Raisio developed its

own energy and environmental index to measure the efficiency of cultivation. In 2011, Raisio introduced a Closed Circuit Cultivation CCC® concept, which includes three main indicators measuring the energy and resource efficiency of cultivation. The concept includes indicators called EcoPlus, CarbonPlus and WaterPlus that assess agricultural energy efficiency, carbon footprint, nutrient balance and eutrophication potential.

## CARBON AND WATER FOOTPRINT LABELS TO MEET CONSUMER DEMAND

Research indicated that consumers’ environmental awareness increased at the end of the 2000s. In the early 2000s Raisio was involved in a project calculating environmental effects, such as the carbon footprint of Raisio Nutrition’s product Elovena Oat flakes. Raisio wanted to meet consumer demand by providing environmental information in the form of a carbon footprint label, and in 2008, Elovena Oat flakes was equipped with a carbon footprint label presenting the carbon dioxide emissions in a numeric value. The label has since been updated to respond to consumer feedback, and now include a carbon dioxide equivalent and a coloured scale to indicate whether the value is high or low.

Raisio started the assessment of water footprints in 2008. International research reports had indicated that water stress was increasing and that fresh water shortages would soon cause severe problems. These effects would be seen more quickly than the ones caused by climate change. Raisio wanted to identify the effects on water resources resulting from its own activities and from the product chain. The Water Footprint Network introduced a methodology to calculate the total water consumption embedded in a product chain and Raisio decided to adopt the methodology. The water footprint was initially calculated for Elovena Oat flakes, including green and blue water footprints. Introducing a water footprint label was a natural step to take. It had the same layout as the first carbon footprint label. Elovena Oat flakes was the first product in the world to include both carbon and water footprint labels in 2009.

After the introduction of the carbon and water footprint labels Raisio has received a lot of positive feedback from stakeholders. Whereas the carbon footprint label has had more consumer feedback and visibility in media, the water footprint label has attracted attention from the scientific community. Raisio has received only a few questions and comments on the water footprint label from consumers, and they are more or less the same as with the carbon footprint: “Is the value high or low, and how does the value of Elovena Oat flakes compare with other products?” The scientific



community has been more interested in how the introduction of labels has affected sales of the product. The biggest advantage of the introduction of the water footprint label has been the possibility to share our thoughts and knowledge on sustainability.

### IMPORTANT INFORMATION TO IMPROVE WATER STEWARDSHIP IN THE AGRI-FOOD SECTOR

Our water footprint assessments show that most of the water footprint of Raisio's products in Finland is made up by the green fraction of the water footprint. The share of the blue water footprint is minor because of the nature of the milling process and the fact that irrigation is not used in grain cultivation in Finland. Raisio's latest study from 2012 shows that the grey fraction of the water footprint is the one that is the most important to consider

in Finnish conditions. Finnish lakes and rivers have been under stress in the past due to agricultural operations and emissions from communities and businesses. Finnish lakes have their own characteristics, and phosphorus is the main critical nutrient.

Working with the water footprint methodology has been important for us: we have learned to understand the issues concerning fresh water availability and water stress abroad. Raisio has recently expanded its operations into new countries and new business areas. It is easier to understand issues in the working environment of these new businesses and supply chains when we have experimented with local products in Finland.

### FURTHER DEVELOPMENT OF THE WATER FOOTPRINT METHODOLOGY NEEDED

The information needed for carrying out the water footprint calculation is relatively easily accessible in Finland. While some meteorological data come with a charge, most of the data can be accessed through public databases or requested directly from companies or public institutions. Consequently it is not the availability that presents the challenge, but rather the collection and management of the vast amount of data needed. Data must be collected from several farms, because Finnish farms are relatively small and one product can include grains from many farms. There could be one, two or even more streams, rivers or lakes into which nutrients leach or runoff from one farm. Every watershed has its own characteristics, critical nutrients and assimilation capacity can vary a lot. Data collection and calculation require a lot of resources and special skills like the use of a geographic information system to locate farms and watersheds to make an exact assessment of a product.

Currently, we are following the development of the water footprint assessment methodology. We have learned that the grey water footprint methodology needs to be further developed and

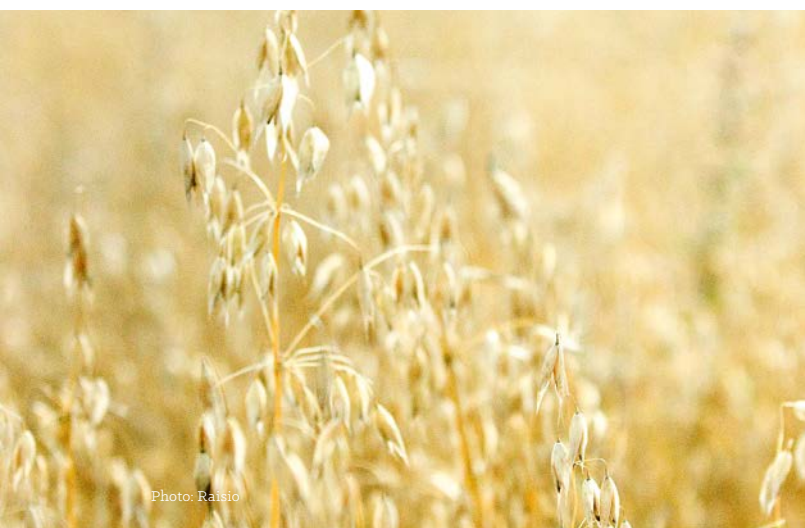


Photo: Raisio



Photo: Raisio



discussed before it can be used in a consistent manner to evaluate and compare farming in different parts of the world. It is also important to find a good way of communicating the results of water footprint assessments. Exact numeric values make people confused because they have nothing to compare them with. We have learned from the carbon footprint labelling that consumers want to know if the value is high or low. CEOs will ask the same question when the results are presented. The water footprint label should have a scale, like Raisio's carbon footprint label, but it is also very important to emphasise of which components – blue, green and grey - the total water footprint is comprised. One solution, which we support and which has been further developed by Water Footprint Network, is to use impact assessments to evaluate the water footprint in contrast to local fresh water availability.

## ECONOMIC BENEFITS FROM IMPROVED SUSTAINABILITY

Being a forerunner in measuring and labelling the environmental effects of our products both in Finland and globally has brought a lot of positive feedback and appreciation from stakeholders and partners, and has opened many doors for Raisio Group to new collaborations and negotiations. Several Finnish food companies have followed Raisio and have studied the carbon footprint of their own product chains. The knowledge of the environmental effects of the Finnish food chain has increased substantially in recent years.

In a listed company it is very important to create value for the owners. Furthermore, it is essential that business maintains economically sustainable. To meet these two requirements, social and environmental aspects need to be taken into account. Although

it is difficult to evaluate the size of direct additional income that carbon and water footprint assessment and labelling have brought to Raisio, it should be remembered that sustainable development include risk and reputation management. Through the life cycle assessment our product chains have been studied more thoroughly, which helps to identify potential risks from the point of view of sustainable development. This information is priceless.



Photo: Raisio



Photo: Raisio



# CROP NUTRITION FOR EFFICIENT WATER USE

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**Holger Brück,**

Senior Scientist, Research Centre Hanninghof, Yara International

**Mogens Erlingson,**

Director Baltics and Development Sweden, Yara Scandinavia

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**Country:** Headquarters in Norway, worldwide presence

**Sector:** Fertilizers, crop nutrition, solutions for agriculture and industrial processes

**Employees:** 9759 people

Agriculture is globally the dominant user of freshwater resources, and successful water management is considered key to ensure global food security. In order to increase transparency about the water costs behind food production, water footprints are increasingly used as a tool to gain insight into water appropriation and impact on freshwater quality. The water footprint quantifies how much water is used by growing crops (green water) and to what extent freshwater is polluted (grey water). Since irrigation is not relevant for the majority of field crops in the Baltic Sea region, green and grey water are in the focus of water footprinting activities.

Crop nutrition is highly relevant in this context: With the harvested crop products nutrient elements are removed from the field and these nutrient elements need to be replaced by adding them via mineral or organic fertilizers. Fertilizer application to fields, therefore, is a central operation to sustain soil fertility. However, this should be done in a way that minimizes water pollution. Effects of crop nutrition on efficient water use and on the risk of polluting freshwater are illustrated in the following two sections.

## FERTILIZERS AND EFFICIENT WATER USE

Water use is a natural and unavoidable process during growth and yield formation of crops. Water use of crops increases with plant productivity, which is most obvious when comparing yields in dry and humid climates. In the Baltic Sea region water is not the prime yield-limiting factor but occasionally low water availability reduces yields. Efficiency of water use can best be described by considering how much yield is achieved per unit of water. From numerous studies it is evident that crop nutrition increases efficiency of water use. Pot experiments which allow for accurate

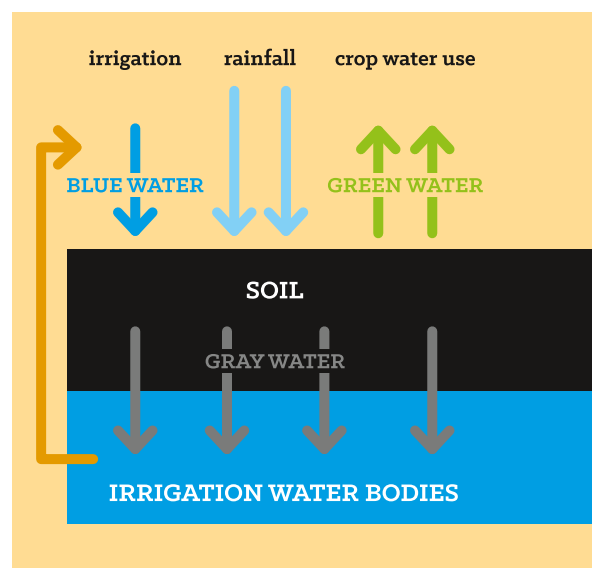
monitoring of crop water use illustrate that the water use efficiency of wheat grain production increased with increasing nitrogen (N) supply. This increased efficiency is due to more vigorous and productive plant growth and less unproductive water loss via soil evaporation. This illustrates that nutrient supply contributes to higher food production per unit of water consumed, meaning 'more crop per drop'.

The increase in water use efficiency implies that less water is required to produce one unit of crop product. Therefore, balanced crop nutrition is a prerequisite for a low green product water footprint of food production.

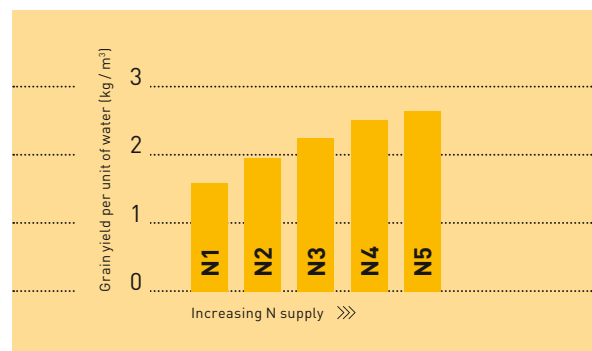
## THE GREY WATER FOOTPRINT CAUSED BY NUTRIENT LOSSES

Crop production implies some nutrient losses to freshwater via surface run-off and leaching. Flows of nutrients such as nitrogen and phosphate threaten drinking water quality and promote eutrophication of water bodies, something which is especially relevant and challenging for the Baltic Sea region. In order to minimize freshwater pollution, nutrient application in excess of crop demand should be avoided. This has been recently illustrated by Delin and Stenberg (2014, European Journal of Agronomy) who showed that fertilizer application rates in the range of the economic optimum application rate do not induce fertilizer-induced leaching while overfertilization did.

Yara provides farmers with scientific fertilizer recommendations based on in-depth crop knowledge and offers tools and services like the computer-based nutrient management program YaraPlan® or tools to estimate the nitrogen demand based on in-field plant analysis by Yara N-Tester®. Site-specific nutrient supply is one of the main objectives in precision agriculture



The water footprint quantifies water availability by rainfall and irrigation (blue water), how much water is used by crops (green water) and estimates the pollution of freshwater bodies (grey water).



Nitrogen supply increases the efficiency of wheat grain production per unit of water use. Results are based on two pot experiments in which water consumption was recorded daily from sowing to harvest.



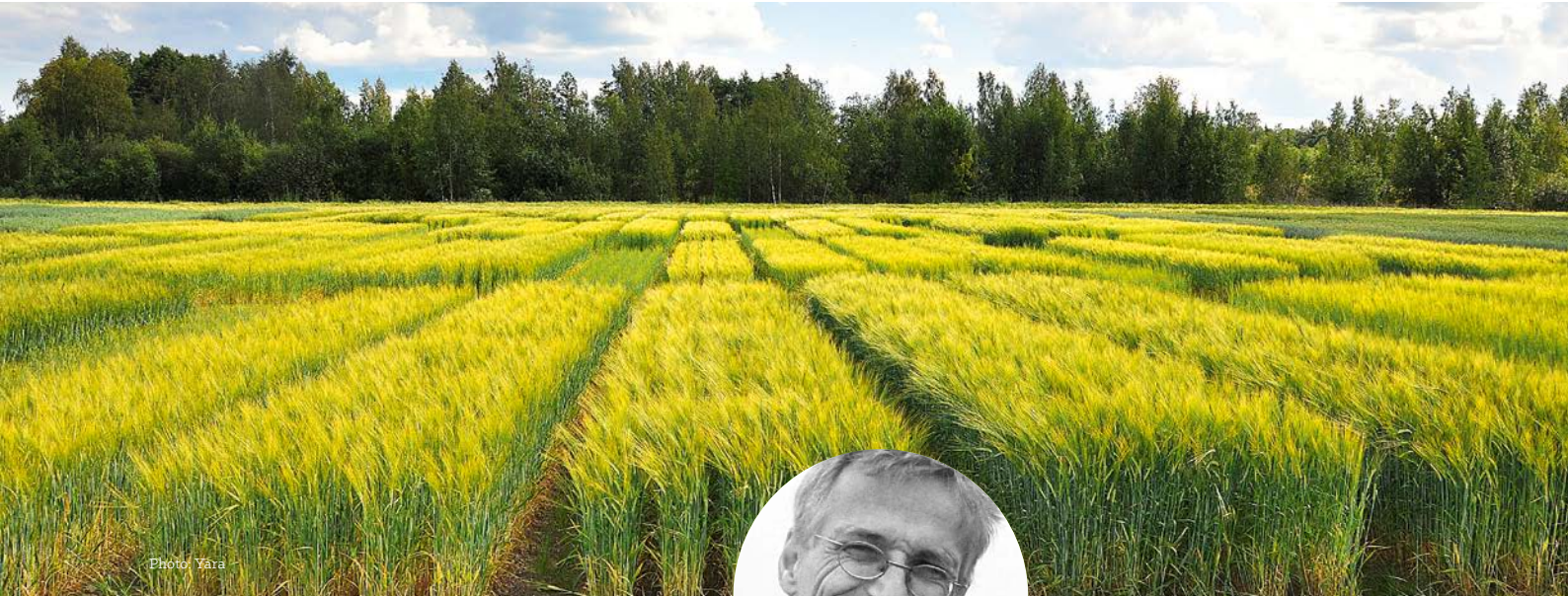


Photo: Yara



## INTERVIEW WITH HOLGER BRÜCK

**What is Yara's motivation for engaging in water footprinting activities, and for providing advice to farmers for improving water and fertilizer use?**

Water availability is a key resource of global food production. Both regional water management and international food trade need transparency about the water use of agriculture. Water footprinting is a suitable tool for quantifying the water use in agricultural production in a holistic way. Water and nutrients are key resources of plant growth which are tightly connected. The optimal use of water and nutrients by farmers is key to achieving sufficient food production at minimum environmental impact.

**In your text you are referring to "water wise crop nutrition". How would you define this?**

A 'water-wise' crop nutrition program considers the strong interaction between water availability and crop nutrient demand. The challenge is to tailor crop nutrition to water availability. This requires adapting timing, amount, placement and nutrient form to local and seasonal growth conditions.

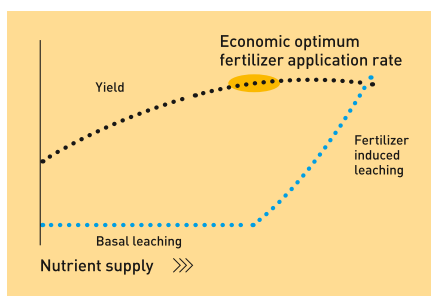
**Yara is developing a water footprint calculator. How will it work, and how do you hope it will be used?**

We consider a water footprint calculation as a benchmarking tool which should help growers to compare their nutrient and water management with regional or national water footprints.

**What is your vision for sustainable agriculture in the Baltic Sea Region?**

Sustainability is defined by several indicators. Sustaining soil fertility, the economic viability of farms, and minimizing the environmental impacts of agriculture will continue to be in the focus of Yara's crop nutrition programs.

and is an enabler for a 'water wise' crop nutrition. Spatial variability of nitrogen availability can be monitored with the Yara N-Sensor®. This sensor was developed to determine the crop N status by measuring the light reflectance properties of crop canopies and to enable variable rate fertilization "on-the-go".



*Schematic relationship between nitrogen supply, yield and nitrogen leaching. Yield increases with nitrogen supply until a yield plateau is achieved. The economic optimum fertilizer application rate is lower than the N input required to achieve the maximum attainable yield. It varies between farm sites and market prices for fertilizer and products. In the range of economic fertilizer application rates, fertilizer-induced leaching is not or only slightly higher than the basal leaching amount of nutrients.*

Consideration of in-field variability in crop nutrient management increases yield per unit fertilizer applied. In trials at 23 locations with winter wheat yields of variable rate N treatments were compared with uniform N treatments fertilized according to farm practice. The average yield increase was on average 6% while the average N saving was 14%. This illustrates that Yara N-Sensor®-based variable rate N fertilization increases N use efficiency and lowers the risk of nutrient leaching and the grey water footprint of crop production.







# CONTINUOUS IMPROVEMENTS, PIONEERING NEW TECHNIQUES AND PARTNERING WITH OTHERS

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**Wouter de Groot,**  
CSR and Risk Manager, Carlsberg Group

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**Country:** Headquarters in Denmark, operations globally. Examples in the text are from Baltika Breweries, Russia

**Sector:** Brewing

**Employees:** More than 40 000 people in the Carlsberg Group

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The Carlsberg Group recognises that water is one of the world's most important resources. At the same time, it is key to the sustainability of our business. In order to make beer, one needs water. To make enough beer to be among the largest global beer companies in the world, one needs a lot of water. And to brew the high quality beer for which Carlsberg is known, one needs water at good quality.

Responsible water management has always been high on the agenda for Carlsberg, and this commitment has resulted in the group now being the most efficient global brewing company in terms of water consumption within brewing facilities. But increasingly, we realise that in order to ensure a sustainable supply and availability of water for ourselves and the communities in which we operate, we need to collaborate with global and local organisations to ensure integrated water resources management and find common solutions to address water risks.

## A CONTINUED FOCUS ON WATER EFFICIENCY

For many years, Carlsberg has been committed to continuously improving the water efficiency of the brewery operations. Since 2009, we have reduced the water used to make our products by over 10%. These strong improvements are a result of cultivating an awareness within our operations to save natural resources, investing in water savings equipment and implementing a robust system to track and improve water consumption for each of our global facilities.

Our breweries in the Baltic Sea region are today among the leaders in our group when it comes to water and environmental efficiency. Our Russian brewery in Tula, one of the group's largest, has achieved strong water improvements in its operational water efficiency over the years, managing to reduce its consumption with over 15%. Our Lithuanian company's Svyturys-Utenos Alus, which is situated in the so-called Country of Lakes and located just a couple of kilometres away from the boundaries of the National park has since 2011 been implementing an ambitious 'Country of Lakes ecological programme' to turn this region into the most ecologically sustainable part of Lithuania, focusing on reducing resources used in the brewery and organising clean-up trips in the national park for employees and business partners.

One of the main features of our global water reduction strategy is to continuously share best practices across our different brewery facilities. Teams of internal water experts are deployed on a regular basis to conduct cross-audits at sites and identify areas

where water consumption can be improved. In 2013, Carlsberg announced a new three years Efficient Brewer Programme to help further improve our water efficiency and find innovative solutions throughout the breweries. We have set ambitious targets to improve our performance, and during the next three years we will implement actions across our sites to deliver on these targets.

While target setting is an effective way to drive performance, we have found that a more holistic approach is required to address water challenges and secure future sustainable and affordable supply of water. Within our own organisation, we take an integrated approach to ensure that key stakeholders – including engineers, brew-masters, sustainability experts and senior management, are involved in the development of our approach. In an external perspective, we have focussed our efforts on two elements: First, improving our understanding about the specific water challenges in the watersheds in which we operate. And then, with this improved understanding, seek partners that can help us to address these challenges.

## ASSESSING WATER RISK

In a response to the growing issue of global water risks, Carlsberg initiated a Group-wide assessment in 2011 to better understand the exposure to current water risks, and develop a scenario-based model to predict how the situation in the watersheds in which the breweries are located will develop during the next 5-7 years. In our assessment, we took a broad approach to water risks, focusing on quantity (water stress), quality, regulatory frameworks, source vulnerability, watershed risks and stakeholder relations.

The results showed that at a global level, Carlsberg is in a good position to manage water risks in the short to medium term but that a number of our local breweries are exposed to immediate and future water risks. In 2013, we repeated the exercise, this time focussing on those breweries that were identified in the first study as potentially subjected to high risks. The conclusions from both the studies indicated that despite strong operational performance and knowledge, we need to look beyond the walls of our breweries and actively engage with partnerships on a local and global level to address growing water challenges.

## PRIVATE-PUBLIC PARTNERSHIP TO DEVELOP INNOVATIVE ENVIRONMENTAL SOLUTIONS AND ADDRESS WATER CHALLENGES IN RUSSIA

One of Carlsberg's most important markets is Russia. Carlsberg's



daughter company Baltika Breweries is the market leader in Russia and we expect to continue to grow in the coming years. Apart from brewing beer, a large share of the malting barley is grown locally in Russia – often through direct collaboration with local farmers.

Surface and ground water resources in the Russian Federation are exposed to increasing stress as a result from water extraction for multiple uses, pollution from point and non-point sources, as well as loss of critical aquatic habitats. Arable land is exposed to increasing environmental pressures resulting from intensive agricultural production with application of fertilizers and agro-chemicals, impact on soil structure, loss of organic matter, erosion, and soil degradation often resulting in the long-term loss of soil fertility. With the effects of climate change that already contribute to further exacerbating environmental pressures on water and land resources in the Russian Federation, further stresses must be expected in the future. These developments have resulted in increased pressure on downstream trans-boundary surface and groundwater bodies, and could in a longer perspective challenge Carlsberg's accessibility to natural resources.

In 2012 Carlsberg, through its Russian company Baltika Breweries, signed an agreement with the United Nations Industrial Development Organization (UNIDO) to create a partnership to jointly develop projects in the Russian Federation that will lead to more environmentally sustainable solutions.

With this agreement, Carlsberg Group and Baltika will invest up to 1 billion RUB, approximately 30 million USD, in projects within water, agriculture and climate change in Russia. This public-private partnership is the first of this kind in Russia and represents a new way of thinking about environmental sustainability. The partnership will deliver environmental benefits through reducing natural resource consumption including water as well as energy, pollution, and greenhouse gas emissions, while also improving water systems through a series of cross-sectorial investments and collaborations with local and national authorities as well as civil society organizations.

While water and energy prices in the Russian Federation vary widely between regions and while a general trend of increasing prices can be observed, they are generally still too low to provide the economic incentives to trigger a change towards more resource efficient and cleaner production processes. Under

**“Increasingly, we realise that in order to ensure a sustainable supply and availability of water for ourselves and the communities in which we operate, we need to collaborate with global and local organisations to ensure integrated water resource management and find common solutions to address water risks.**

the prevailing price regime many innovative “waste to energy approaches” are not economically viable.

Compared with best international practice there are still significant opportunities to improve Russian agricultural standards and practices in order to minimize the impact of agriculture and over-fertilization on climate change, land degradation, water

body eutrophication and biodiversity loss. Regional institutions for water and land resource management lack the institutional capacities for the development of the regulatory and economic instruments necessary to mainstream resource efficient cleaner agricultural production and brewing processes.

Carlsberg and UNIDO will jointly address these challenges in an approach that targets both on-the-ground solutions while also strengthening institutional frameworks and policy development to result in stronger integrated water resource management. Initiatives include public-private partnerships for water protection and management; assistance to local and regional governments in assessment and modelling of water resources; implementation of integrated watershed management programmes, restoration of wetlands and water bodies, and collaboration with farmers to improve practices. In addition, there will be investments in infrastructure for groundwater replenishment and for wastewater



treatment, also in order to use treated wastewater for water and nutrient efficient drip irrigation.

At Carlsberg, we normally say we are good at making very high-quality beer. We have also demonstrated that we can be highly efficient in terms of using the resources needed to produce our beer. However, when it comes to global challenges such as water, we realize that we cannot do this alone and need to in-source expertise. UNIDO has a proven track-record of helping industrial organizations improve their environmental standards. Baltika Breweries has already received widespread recognition for its sustainability activities in Russia. Through this partnership, UNIDO can support and strengthen these environmental efforts by developing and sharing international industry-related knowledge and providing technical expertise. By working with UNIDO, we also will have an opportunity to further strengthen one of their core values of engaging with society through dedicated community activities focused at improving integrated water management across Russia.

In the development of the partnership, it has been crucial to define those areas where the mutual expertise of both Carlsberg and UNIDO could benefit the wider environmental systems. A transparent dialogue and understanding of how both organizations can work optimally together has been crucial. This is in line with Carlsberg's history to share important innovations that can benefit society. These experiences, including technical findings, results and overall organizational improvements will be disseminated through various industry and global platforms.





# EVERY DROP COUNTS: SUSTAINABLE WATER RESOURCES MANAGEMENT IN COCA-COLA HBC POLAND

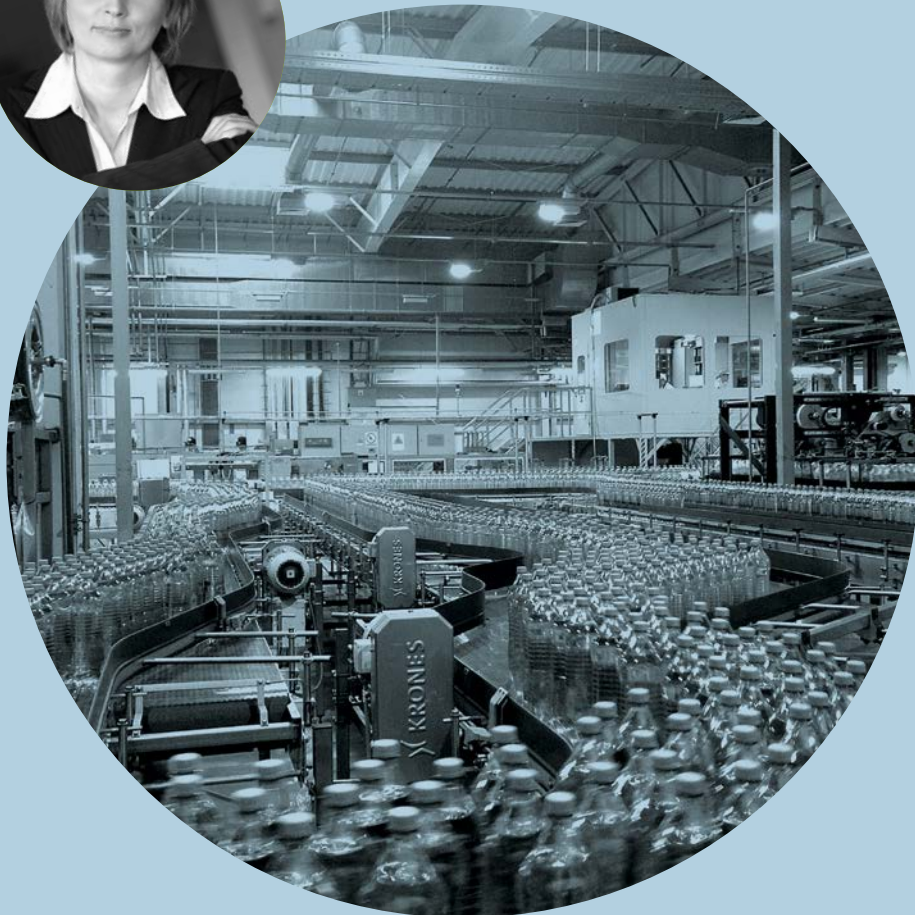
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**Agnieszka Krejner-Paweł**,

Environmental & Regulatory Affairs Manager, Coca-Cola HBC Poland

**The team at the Tylicz plant, Poland**

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# COCA-COLA HBC POLAND

**Country:** Poland

**Sector:** Non-alcoholic beverages

**Employees:** 2 100 people within Coca-Cola HBC Poland

As a leading producer of beverages, Coca-Cola HBC Poland understands the importance of issues linked to the availability of water, and the sustainable use of this resource. In view of the growing global challenges connected to the accessibility of drinking water, we recognize that responsible management of water usage is everyone's duty – on a global, European, Polish and especially local level.

While demand for water is increasing, climate change in combination with a rising population density and progressing urbanization means that challenges connected to water availability shall become increasingly acute. This also applies to our country. Poland is among the European countries with the least water resources per capita.

The development of our company is inextricably linked to the availability of highest quality water. Water is an essential ingredient in all of our beverages. It is also essential to agricultural production, for example sugar beet and fruit, which we use in our products. Water is necessary for further economic development and for the prosperity of the communities in which we operate.

Therefore, protecting water resources is an integrated element of the Coca-Cola Hellenic Poland strategy, and we work towards increasing the efficiency of water use in our plants, engage in projects protecting water resources and develop public awareness of the importance of water.

## OUR PRIORITIES

The water resources' management strategy of Coca-Cola Hellenic Poland is based on three main operation areas: reducing water usage, recovery of water utilized in the production, and the protection of existing water resources. To this end, we are trying to increase production efficiency in terms of water usage annually.

## WORKING IN PARTNERSHIP

On the international level, Coca-Cola Hellenic is the signatory of the CEO Water Mandate initiative carried out by the UN Global Compact. It is aimed at governments and NGOs and its objective is to shape pro-environment laws and sustainable use of water in operation processes and the supply chain. In order to better understand the use of water in our supply chain, Coca-Cola Hellenic cooperates with the Water Footprint Network. In 2013 we started preparations to obtain the European Water Stewardship certificate, enabling us to demonstrate to our stakeholders that we are dealing with water in a more sustainable manner.

## UNDERSTANDING WATER RISKS

The starting point for us is to ensure the sustainability of our own water use. We continuously monitor our water usage, minimise the volumes we withdraw, and ensure that all wastewater is treated before reaching the environment. We conduct a detailed assessment study of water sources for all our plants. These assessments, periodically updated, quantify and qualify water availability and assess environmental, social and regulatory concerns. The Source Water Protection Program is dealing with the identification of possible hazards, the assessment of the related risks, and the elaboration of adequate mitigation plans.

## IMPROVING OUR EFFICIENCY: CREATING A "WATER RESPECT CULTURE"

The Tylicz plant was set up in 1992 and became the property of Coca-Cola HBC Poland in 2003. The plant produces natural mineral waters: Kropla Beskidu and Multivita from Kropla Mineralów source, and utilises a dozen springs of 120 m depth, located within a radius of 8 km from the plant.

The sustainable development of water resources in our plant takes a holistic approach in order to develop, conserve, and manage water resources, considering all components of the hydrological system. Such a comprehensive approach has required a lot of time, changes, efforts, employees awareness raising and a great engagement of the plant staff and managing team.

When comparing the water utilization over the last few years, it becomes evident that great improvements in water saving



The Tylicz plant has made substantial water savings within the production.



management have been achieved. Our water utilization in 2005 was only 56%. After a detailed and complex approach followed by the implementation of improvements, the plant water utilization ratio currently amounts 96%. This means that we have managed to reduce our wastewater volumes by half, saving a great amount of this nature's most precious resource.

The first and most important step was to build a "water respect culture" across the plant. We pointed out the importance of the issue and reviewed, discussed and explained it many times during different meetings, water projects groups and during individual talks with operators, sharing views and ideas for how to save water. Our water projects groups used the Kaizen philosophy to evaluate in teams. The rising awareness and the creation of a water respect culture is a continuous process that needs to be cultivated. The water saving philosophy that was established at the plant is to 'save every single drop of water'. This is continuously implemented: the high level of staff awareness has led to the implementation of several innovation projects. Innovative ideas for how to save water are registered, reviewed and monitored in the "Innovation Leader Database", which became a successful tool to support the plant's water saving philosophy, and has brought forward hundreds of bigger and smaller ideas for improvement. Employees also use the Near Miss base to register and inform about incidents of water loss or of negligence, even the smallest ones like a dripping tap or steam leakage. Now we can surely confirm that Tylicz employees are open-eyed and aware of the fact that the drops coming from each single pipe, valve and tap together add up to cubic metres of waste.

In parallel to building the employees' awareness and engagement to save water, we conducted a detailed analysis to determine what processes and machines had the biggest water consumption. As a result, several investments and good practices were implemented.

**“Along the way to the results we achieved, we have found that the most crucial factor in the process is our employees' consciousness of the importance of saving water, and their engagement in the improvement activities.**

Water management improvements implemented on the technical side include measuring and reporting every single litre of water used; recovering and recycling the water used for rinsing; optimizing backwashing of filters, and using less water for rinsing equipment. We have also switched to dry lubrication of conveyers (water saving: 15 000 m<sup>3</sup> yearly), air rinsing (water saving: 24 000 m<sup>3</sup> yearly), and are reusing the water utilized for clearing blockages in the wells (water saving: 1 000 m<sup>3</sup> yearly). In addition, the water used for cleaning filters, for cooling and for rinsing bottles is recirculated. The reuse of the water from the bottle rinsing process alone save 20 000 m<sup>3</sup> yearly. Actions have also been taken in order to improve logistics in order to find the optimal production and shifts sequence.

As a part of our continuous improvement, we are constantly ensuring that all leaking valves and fittings are tightened, valves are working properly, hoses have automatic and functioning shut-off nozzles, gaskets are repaired and replaced, and cleaning processes are optimized. We have also put in place mechanical seals on packaging so as not to require sealing water.

Initially we built our activity alone, mainly referring to our own experience and knowledge. Now we have a very useful tool – the CCH

DOXX database - where good practices and ideas for saving water can be shared between all Coca-Cola Hellenic plants and countries. What we have learned is that a water savings philosophy is not a single impulse job, it is a complicated and continuous process, involving people's experience, knowledge, investing capabilities, their openness to change, willingness to improve and, of course, is not always crowned with success. Along the way to the results we achieved, we have found that the most crucial factor in the process is our employees' consciousness of the importance of saving water, and their engagement in the improvement activities. The final users of water are the ones that create our water Key Business Indicators (KBIs).

## COMMUNITY PARTNERSHIP TO PRESERVE LOCAL WATER RESERVOIRS

As a producer of natural bottled waters and owners of the Tylicz plant, we feel responsible for maintaining and preserving the unique heritage of the local water reservoirs. The Kropla Beskidu Fund project was launched as a joint initiative of Coca-Cola HBC Poland and Coca-Cola Poland Services, the Partnership for the Environment Foundation, and its governing body, the Partnership Fund Foundation.

The Kropla Beskidu Fund supports citizens' initiatives to protect water resources in the Beskid Niski and Beskid Sądecki mountains. The Kropla Beskidu Fund strives towards getting the Beskid Sądecki community involved in actions aimed at protecting water resources. It is essential that the residents undertake such activities in cooperation with the local authorities, private businesses and non-government organisations.

The key aim of the project is to inspire citizen's initiatives aimed at protecting and respecting the regional water resources' heritage, incorporate such initiatives into the action plans of institutions responsible for water management, raise citizens' awareness of the actions of local water management institutions, and provide financial and organisational support for the most interesting initiatives.

Contests with small grants have been organised since 2005. Each year both Coca-Cola and the Foundation allocate funds to the account created for the purpose of the Partnership Fund Foundation, which runs the contest and additional actions supporting the existing and potential beneficiaries - training programmes, advice, and study visits.



Photo: Coca-Cola HBC Poland

One of the wells in Tylicz, Poland.

# CURBING WATER USE AT THE LÖRENSKOG PRODUCTION PLANT

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**Monica Videm,**

Corporate Responsibility & Sustainability Manager,  
Coca-Cola Enterprises Norway

**Laure Droual,**

Water Stewardship and Energy & Climate Change Environment Senior Manager,  
Coca-Cola Enterprises European Supply Chain

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Photo: Coca-Cola



# COCA-COLA ENTERPRISES NORWAY

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**Country:** Norway

**Sector:** Non-alcoholic beverages

**Employees:** 700 people in Coca-Cola Enterprises Norway

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Water is one of nature's most precious resources. It is critical to our communities, ecosystems and key to our business sustainability. It is an essential ingredient in all our beverages – a Coca-Cola consists to 90% of water - and is central to many of the agricultural components that make up our products and our manufacturing processes.

This means that Coca-Cola has a great responsibility to use water in the best way. Water is generally regarded as abundant in Europe. However, increasingly disruptive weather patterns are raising concerns of scarcity, flooding and moreover potentially unreliable water quality in some more densely populated areas. As a bottling industry, we are seen as high water consumer and need to be responsible and sustainable with regards to water abstraction.

Coca-Cola has outlined a commitment on water stewardship as part of its CSR strategy, to improve water efficiency, the water sustainability of operations, and minimizing water impacts throughout the entire value chain. Sub-commitments have been set for each area, which are followed-up and monitored by indicators.

Our direct water consumption is key, and we take measures and make investments to reduce this water use. Our water consumption has seen huge improvements these last years. While Norway is a country which usually has an abundant supply of clean water, our strategy to be a leader in water stewardship is as important here as it is in other countries. In 2012, we made new investments in our production at Coca-Cola Enterprises Norway, which has resulted in a significantly reduced water consumption.

## INVESTMENTS IN A NEW PRODUCTION PLANT – TRANSITIONING TO RECYCLABLE BOTTLES TO SAVE WATER AND CHEMICALS

In 2012 Coca-Cola Enterprises Norway invested in the production plant in Lørenskog, to facilitate sustainable operations and growth in the coming years. Production lines were adapted in order to be able to handle recyclable bottles instead of refillable bottles. This brings great environmental benefits. In particular, it lead to a sharp decrease in water consumption. Our ambition is that our production on Lørenskog is to be the most water efficient factory throughout the Coca-Cola Enterprises Norway. The increasingly sustainable use of water is one of the most exciting results of the switch from refillable to recyclable bottles. Previously we used 2.2 liters of water to produce one liter of bev-



Photo: Coca-Cola

The new recyclable bottles used at the Lørenskog plant are blown up from small pre-forms.

erage. After the transition to recyclable bottles in 2013 the water consumption was down to 1.44 liters - a significant reduction. We are now well on the way toward the goal of not using more than 1.2 liters of water per liter produced beverage by 2020. The total water usage has gone down from 463 324 000 liters in 2011 to 283 058 000 liters in 2013, a reduction by 39%.

The main reason behind the water savings is that we have been able to remove the bottle washing machine, which used large volumes of water when washing the old bottles between uses. Previously millions of used bottles arrived to the factory and had to be washed before being refilled. The new recyclable bottles are instead blown up from small, unfinished pre-forms. When they are returned, they are compressed, grinded and recycled. Another major cause of water savings is that the new production no longer uses water for lubrication. To prevent the bottles from falling off the conveyor belt, minimal friction is required. Previously, the belt was continually sprayed with water-based lubricant in order to smooth movements. With the new and modern lines we can use a dry substance that acts as a silicone. It spread by only a few drops every few hours. The result is a decreased the use of both water and chemicals. Wastewater volumes have also been reduced as a result from these changes. In 2012 the production resulted in 259 292 000 liters of wastewater from production, compared to 152 176 000 liters in 2013, a reduction of over 41%. All wastewater - 100% - is returned to nature safely through the treatment plant. There is often a link between economic and environmental sustainability. One of many examples of this is that less and cleaner waste water also costs less to discharge.

## WATER STEWARDSHIP THROUGHOUT THE VALUE CHAIN

As in all of the Coca-Cola Enterprises' plants, CCE Norway is taking into account their water impacts resulting both from the direct operations, but also from the whole supply chain. We are committed to being responsible stewards of water, and to use as little as possible for each liter of beverage we produce. Our commitment on water stewardship states: "We will set the standard for water efficiency, establish a water sustainable operation and minimize water impacts throughout our entire value chain."

We want to be the leader in water efficiency within the beverage industry, establishing a water sustainable operation and understanding water impacts throughout our entire value chain. This includes looking at where our use of water has the greatest impact across our entire value chain, including the ingredients we use. We will also work with our suppliers to minimize water impacts across our supply chain and ensure that the sugar we use is sustainable.

A study conducted in 2009 showed that our production process accounts for only 1% of our water footprint. The most part, 76%, is attributable to the cultivation and refining of sugar beet. This prompted us to carry out Water Footprint Sustainability Assessments in 2010 and 2011, in cooperation with all of our European sugar suppliers, looking at their impact on local water quantity and quality.

All our plants have undertaken Source Vulnerability Assessments - a hydrogeological study performed by an external expert - in order to assess potential water risks to our business, the local community and the ecosystem. Taking a catchment



Photo: Coca-Cola

based approach, these assessments evaluate the local water resource systems, current and historic water quality, and current water stresses and potential drought risks or natural disasters. In addition, each of our plants have put in place Source Water Protection Plans developed together with local stakeholders. They are reviewed annually and mitigation plans are updated as necessary. Our water stewardship ambition and strategy is communicated via several channels, our website, through blogs, social media and webinars.

The goal for water use as defined in Vision 2020 is a strong signal that Coca-Cola Enterprises takes the environment seriously, and shows the way in which choices and priorities that need to be

**” The total water usage has gone down from 463 324 000 liters in 2011 to 283 058 000 liters in 2013, a reduction by 39%.**

done every day. Now that we have new and modern drain lines, we are well placed to reach this vision in Norway. To achieve this goal, it also requires our entire organization to be dedicated towards making those choices each today that together make that vision become reality.

If we were to provide advice to others that want to embark on the same journey it would be that working towards sustainable water management entails managing direct and operational water impact such as water use consumption, and implementing strong programs to reduce them. The basics such as water mapping, best practices sharing, and strong investment processes should be implemented as well. However, one also has to take into account the water impacts in the whole supply chain, first by understanding how much of the impact derives from the product water footprint, and then understanding the impact assessment in order to adopt the right mitigation plans so to reduce this impact.





# WATER MANAGEMENT PLANS AND STORM WATER PONDS – WATER STEWARDSHIP AT SWEDISH AIRPORTS

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Interview with

**Helena Svensson**, Environmental Controller, Swedavia

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# SWEDAVIA

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**Country:** Sweden

**Sector:** Swedavia owns and manages 10 airports throughout Sweden. The company is state-owned.

**Employees:** 2 400 people

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During recent years, Swedavia has made significant investments in order to improve the water management at the ten airports which the company runs across Sweden. The Swedish national Environmental Objectives, “Miljömålen”, and the EU Water Framework Directive sets the legal environmental framework in which Swedavia operates, but provide a starting point rather than the bottom line.

*“Just adhering to the legal framework on water and environment is not enough, we want to aim higher. In our 3 year business plans we set our own environmental goals that we work towards,” says Helena Svensson, Environmental Controller at Swedavia.*

Currently the key water indicator incorporated into the business plan is to monitor the oxygen levels in recipient water bodies at the airports, making sure it never drops below 5 mg/litre. The reason for choosing this particular indicator has to do with the main water related challenge at airports, namely storm water management.

**“Our goal with this strategic work is to minimize our impact on the surrounding environment, but the water management plans are also tools for communication. Being able to showcase that we work proactively with water management builds trust and aids us in our communication both with the general public and with authorities.**

The high percentage of impermeable surfaces at an airport results in large volumes of rainwater run-off. Due to security reasons, run-off must be removed from runways and platforms. This results in high volumes of water to be collected and discharged into local watercourses close to the airport. If the effluent is not properly managed, it may cause severe problems downstream in the natural environment.

During the winter season chemicals are used to deice aircrafts and runways. The deicing chemicals are propylene glycol and formiate, which require oxygen for their decomposition. When discharged untreated into the natural environment harmful effects may occur on aquatic life due to high biological oxygen demand. Addressing this, Göteborg Landvetter Airport has constructed a unique system for collecting, sorting and reusing

the deicing fluid for aircrafts, mainly glycol. The process consists of several steps:

As the aircraft is deiced at gate, suction vehicles collect the drained deicing fluid from the ground and empty the glycol in a tank plant. The deicing fluid that cannot be adsorbed from the ground drains down in a drainage system with ultrasound separating technique that separates high concentrated fluids from low concentrated fluids. The high concentrated fluids are collected and is treated to reach a concentration of approx. 50%, after which it is reused as raw glycol. The low concentrated fluid is discharged into a system of storm water treatment ponds.

The ponds cover an area of 5 ha and were constructed in 2010. Here the low concentrated fluid from the deicing process as well as the overall storm water volumes from the airport are treated with aeration, sedimentation and biodegradation to reduce the organic matter, nutrients and metals originating from the airport operations. Implementing these measures have contributed to reducing the environmental impact both in the downstream river basin and at the wastewater treatment plant.

A priority for moving forward is to develop water management plans for all of Swedavia's airports, something that will happen during 2014. The ambition is to gather all existing documentation and routines and create a master plan that includes all stages of the water cycle at the airport, not only mapping water sources and discharge but also assessing the impact the airport operations has on the water resources.

*“We want to make sure we have the whole picture. Only by taking a holistic approach to water management is it possible for us to be certain that we have the information needed in order to make strategic decisions to continuously improve”.*

The water management plans will describe the existing systems, identify weak points and draw up action plans for how to improve operations. Whereas traditionally the focus of the environmental efforts at airports has been on air pollution and noise levels, the water management plans offer an opportunity to build awareness – both internally and externally - of the importance of also addressing water issues.

*“Our goal with this strategic work is to minimize our impact on the surrounding environment, but the water management plans are also tools for communication. Being able to showcase that we work proactively with water management builds trust and aids*





Photo: Swedavia

*us in our communication both with the general public and with authorities.”*

Other expected benefits include a better starting point for making strategic decisions across the ten Swedavia airports, and to be able to connect environmental and economic aspects in order to identify the most cost-efficient solutions.

Swedavia has worked together with the European Water Partnership in order to evaluate the European Water Stewardship standard for airports. Swedavia has also looked into different aspects of the water footprint aspect. Embarking on some sort of water certification is foreseen for the future.

Helena’s advice to other companies and organisations seeking to address their water management is to adopt a holistic approach and to make sure that the existing routines and strategies are not only known to a few individuals, but that they are properly documented. In addition, reaching out to external stakeholders is key:

*“We all operate in a social and environmental context, and our water use impacts others both upstream and downstream. Being pro-active in our approach to water management has worked very well for us. Instead of waiting for guidelines from the authorities you can approach them and ask them how you could contribute to meeting the national and regional objectives.”*



Photo: Swedavia

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## *Baltic Development Forum*

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Baltic Development Forum is the leading independent think-tank and network for high-level decision-makers from business, politics, academia and media in the Baltic Sea Region. Baltic Development Forum connects expertise on current and strategic affairs by identifying and engaging key stakeholders, publishing the latest thinking, and facilitating region wide knowledge dissemination. Water is one of BDFs key areas, and BDF promotes intelligent and holistic water management from source to sea in order to create a sustainable Baltic Sea and a prosperous Region. BDF works with a wide range of stakeholders across sectors in order to raise awareness on water management issues through projects, publications, the annual Baltic Sea Conference and the BDF Summits. BDF is a member of the Water Footprint Network.

***[www.bdforum.org](http://www.bdforum.org)***

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## *The SAS and Coca-Cola Environmental Foundation*

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The SAS and Coca-Cola Environmental Foundation is based in Oslo, Norway. It has been built on the interests of both founding companies, SAS and Coca-Cola Nordic, to provide support for environmental education and development in the Nordic and Baltic area. Since it's establishment in 1998 the Foundation has awarded grants to schools and non-profit organizations, oftentimes with an emphasis on programs for youth and water.

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Editor: Lovisa Selander,  
Head of Water and Environmental Affairs,  
Baltic Development Forum

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Designer: Jānis Dripe, *[www.dripe.lv](http://www.dripe.lv)*

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MAKING **WATER** YOUR BUSINESS

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Baltic Development Forum (BDF),  
[bdf@bdforum.org](mailto:bdf@bdforum.org)