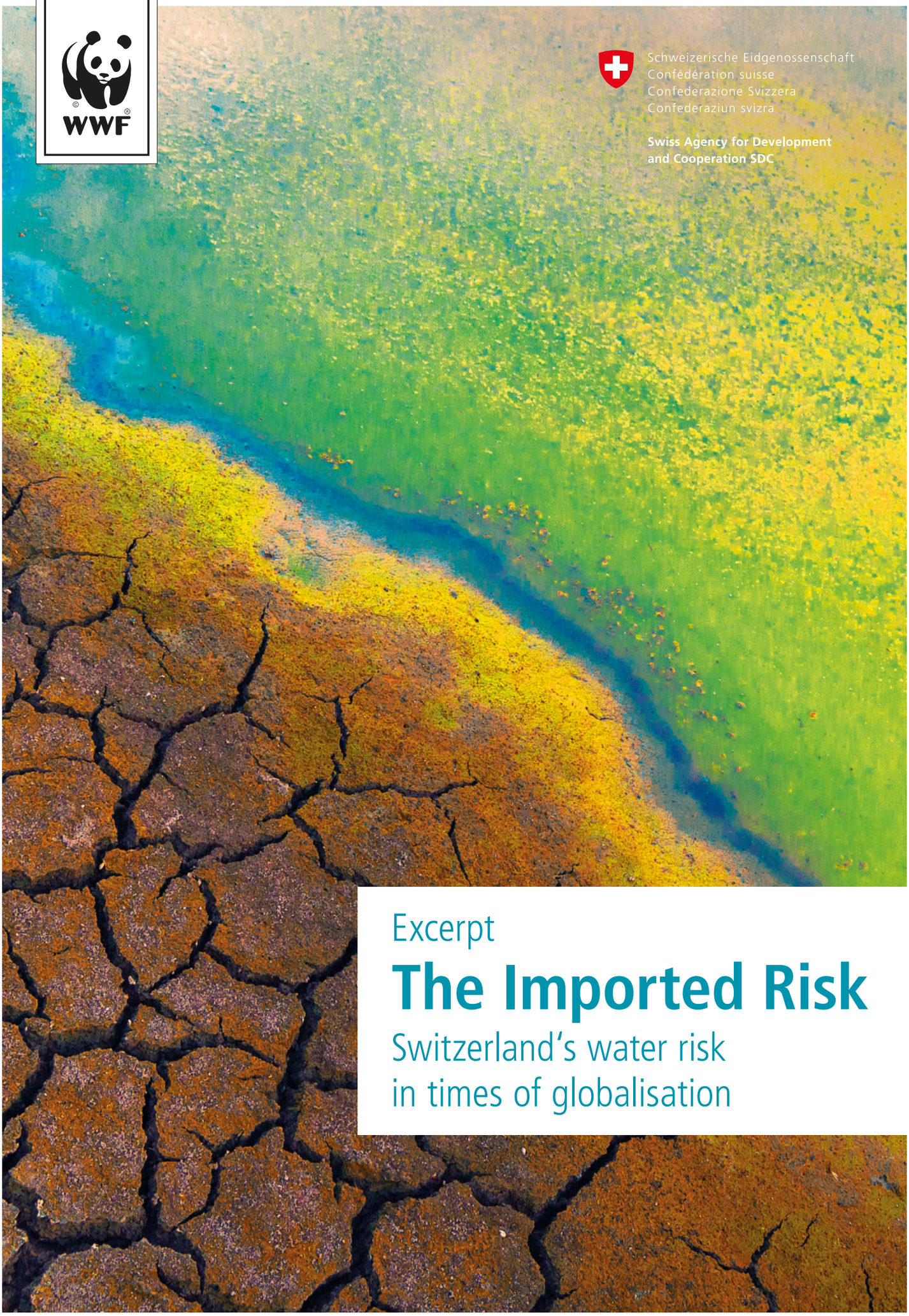

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Swiss Agency for Development and Cooperation SDC

Excerpt

The Imported Risk

Switzerland's water risk in times of globalisation

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Foreword SDC

When astrophysicists look for traces of life in the outer space, they look for water. Water is a resource, which cannot be substituted. Without water there is no food, no health, no energy, no social and economic development and no security.

Naturally, water is the most abundant resource on earth. But only around 0.8 % of it is freshwater readily available as surface water in aquifers, lakes, swamps, rivers and streams. The other 99.2 % is saltwater in the seas, oceans and underground, freshwater locked up in ice or floating in the atmosphere. Today, we are moving dangerously towards a world without safe and accessible freshwater. It is estimated that by 2025, about two-thirds of the global population may be living under water stress conditions.

How does all this concern Switzerland?

Switzerland is not immune to global water challenges

An average person in Switzerland uses 162 litres of water per day according to official statistics. Our country indeed is blessed with plenty of high-quality water resources. 5 % of Europe's freshwater resources are located in Switzerland. A major part of this water is stored in our lakes, glaciers, and groundwater. Switzerland is in a fortunate water situation, we have a strong regulatory framework and governmental enforcement. But we are at the same time not immune to global water challenges. We depend heavily on trade.

Among Switzerland's top 10 trading partners, there are countries like China and India which do face water-related problems. While our service-based exports are not water intensive, we import water intensive products that increase water pressure in other parts of the world. This means that 82 % of Switzerland's water footprint happens beyond our borders, often in regions where water resources are scarce. Hence in reality, the Swiss water footprint is much larger and an average person uses around 4,200 litres of water per day.

How is this possible? The amount of virtual water used to produce food, beverages, clothing and other consumed products is often very high. For example, the production of a small chocolate bar requires around 2,000 litres and a computer up to 20,000 litres of water. A high water footprint is not a bad thing *per se* and does not necessarily indicate a high water risk. A risk may evolve, however, if a product using a lot of water originates from a water-stressed region or a region with unsustainable water management. Equally, a risk may emerge *even* if a small amount of water is used to produce a good. This might be the case, for example, when a company is located in an area with a highly unreliable water supply.

Water-related challenges like pollution, floods, or water scarcity, in our interconnected world have, at the same time, local and global impacts. Switzerland therefore has an interest in and a responsibility to contribute to resolving water issues. This includes tackling water risks related to imported goods, not by refusing to purchase goods from other countries, but by promoting tools that foster efficient use of water, improved

water quality and good water governance, and hence contribute to sustainable use of water resources. Ultimately this improves the situation of the local communities and at the same time reduces our water risk.
Therefore taking such responsibility has not only a direct and positive impact on our economy and our environment but also, and most importantly, on people's lives.

SDG 6 aims to ensure availability and sustainable management of water and sanitation for all by 2030

What are Switzerland's efforts to address global water challenges?

Switzerland is highly active in water issues, both on the global and local level. On the global level, Switzerland has played a key role in the establishment of the Sustainable Development Goal (SDG) 6 on Water and Sanitation in the 2030 Agenda for Sustainable Development. SDG 6 aims to ensure availability and sustainable management of water and sanitation for all by 2030. Switzerland continues to play an active role in the implementation and follow-up of this SDG 6 and other SDGs closely linked to water.

Moreover, Switzerland contributes to establishing a comprehensive understanding of the international water risk that our country is facing. In 2012, the Swiss Agency for Development and Cooperation published, in cooperation with WWF Switzerland, a study on Switzerland's water footprint. As a follow-up of the 2012 study, this excerpt of the report by WWF on *Switzerland's water risk in times of globalization (WWF-Switzerland 2016)* goes a step further by analysing water footprint related risks.

Switzerland plays also an important role in bringing together expertise and knowledge from different fields and stakeholders. We believe that using water sustainably – for the benefit of people, nature, agriculture and businesses, which is the aim of SDG 6 – can only be reached through collective action involving all stakeholders on local, national and global levels. We believe that together, we can act in a responsible manner that puts the right infrastructure, methods and water governance in place to effectively source, manage and replenish water around the world, leaving an adequate freshwater supply for future generations.

Johan Gély
Head Global Programme Water Division,
Swiss Agency for Development and Cooperation (SDC)

Foreword WWF

More than 1500 lakes, rivers, and bodies of water provide Switzerland with an abundance of water. Our country is called the water castle of Europe. In spite of this fact, Switzerland is not insulated from water problems – not only in the future due to climate change, but even today. Why? As part of a globalized economy, Switzerland imports roughly 50 million tonnes of goods valued at CHF 250 billion from abroad. Many of these goods originate from regions with "stressed" water conditions. These regions are increasingly dealing with water shortage or water pollution. Such unsustainable water use results in considerable risks for people and nature: the fragile balance of water cycles is disrupted, and the function of freshwater ecosystems is increasingly at risk.

The consequences of water risks do not only impact far-off lands

The consequences of water risks do not only impact far-off lands. The production processes for many sectors of the Swiss economy directly or indirectly depend on water from abroad, which can have a negative impact on their business performance. As an example: each year, Switzerland imports 126,000 tonnes of rice valued at CHF 90 million. A portion of this originates from India – a country affected by water-logging due to large-scale irrigation schemes, diminishing groundwater levels, and ground salinisation. Moreover, India shares watershed regions with Pakistan, Bangladesh, and Nepal, thus creating a major potential for conflict. Additional uncertainties are brought about by climate change, which is changing precipitation and temperature patterns. The effect on Swiss businesses could come in the form of more volatile prices or potential interruptions in resource availability. This report shows how water risks affect Switzerland's access to agricultural products, textiles, gold, crude oil, and other raw materials.

Switzerland has an inherent interest in building awareness for and in containing its water risks both for economic as well as ecological reasons. Businesses, investors, the government, and consumers are required to do their part. There are a number of ways to reduce water risks, for instance by optimizing water management practices, improving water efficiency, or reducing water pollution. The water stewardship approach expands these options by central aspects, in particular by fostering strategic collaboration between various stakeholders in a watershed. It is a worthwhile effort. The sustainable use of natural resources is an opportunity for people and nature but requires rigorous action.

Thomas Vellacott
CEO WWF Switzerland

Executive Summary

In order to arrive at a sustainable outcome, it is imperative that all sectors – business, government, investors, and civil society – collaborate

Compared to other countries, Switzerland has a fortunate water situation characterised by sufficient availability, good quality, and good governance. However, Switzerland's economy heavily depends on trade. The majority of imported goods originate in locations with water scarcity, deteriorating water quality, regulatory challenges, poor infrastructure, vulnerable communities, or fragile ecosystems. Switzerland thus indirectly contributes to falling water tables or water pollution in these countries and conversely, water related issues in these countries affect the Swiss economy.

Water risks can be physical, regulatory, and reputational. They can relate to conditions linked to a specific location that can only be influenced through collective actions, or to a company's operations and be directly influenced by individual companies. Companies must understand their water risks and strive to sustainably mitigate them to ensure their long-term success. In order to arrive at a sustainable outcome, it is imperative that all sectors – business, government, investors, and civil society – collaborate.

Methodology and Key Findings

This report is based on an analysis of Swiss-Impex import statistics and calculations applying the Water Risk Filter. In this report, four sectors are presented for illustration: agriculture, textiles and apparel, pulp and paper, and financial services.

Though each sector is exposed to water risks, the risks differ in type, intensity, and the stage at which they arise in the value chain. Agriculture is by far the world's greatest water consumer and is vulnerable to climate change-induced physical risks. Rapid agricultural expansion has led to rainforest destruction in large parts of the world, which affects the water regime of entire regions. Within the textiles and apparel sector's value chain, cotton production is the most water-intense segment and is vulnerable to physical water risks. Textile processing is polluting water resources in countries with a weak regulatory environment, posing reputational and regulatory risks. The pulp and paper industry is the largest industrial water consumer in developed countries and thus exposed to physical risk. It is also a significant water polluter. The water risks for the financial services sectors are mostly indirect since they are connected to investments.

Water Stewardship

Many risks only emerge because various stakeholders use the same water source. Thus, the root cause of water risk is often not the availability or use of water, but governance. This concerns all stakeholders from the public and private sector and civil society. Water stewardship is an opportunity especially for companies to contribute to the sustainable management of freshwater resources in a river basin. This step-by-step approach enables companies to create internal water awareness, analyse their water risks, and reduce these through internal and external measures. A company can rarely reduce all of the water risks it shares with water users in the same basin or other companies along its supply chain on their own. Water stewardship activities aim to drive companies towards collective action with other water users, public authorities, or civil society in a given river basin.

There is an essential business case for achieving sustainable access to clean water in order to sustain production and profitability: Companies focused on reducing their risks by improving the local situation will have a competitive advantage by being able to stabilise their production volumes and quality by investing in long-term customer relations and trusted local partnerships.

Call to Action

Companies
Ultimately, companies bear the consequences of water-related risks. However, it is in their power to mitigate these risks in their direct operations or by defining standards within their supply chains. Internal actions that companies can take include identifying risks, impacts, and responsibilities related to water, developing and implementing company-specific water stewardship strategies, and applying available sector-specific solutions. Externally, companies can engage in collective action for sustainable water management, drive transparency, and disclose their actions.

Investors
Some strategies investors can take include developing internal standards and policies for decision-making processes regarding water risk, systematically assessing investments, clients, transactions, and portfolios for water-related risks, developing sector-specific sustainable strategies to reduce water risks, restricting clients that do not appropriately address water-related risks, and proactively supporting companies that are seeking to reduce water-related risks.

Public Sector
Public authorities can contribute to reducing water risk and enable collective action by creating awareness of the international water risks, by developing water stewardship targets and sustainable water criteria and by making sure that all relevant actors are included. Furthermore, governments should contribute to the achievement of the Sustainable Development Goals.

Consumers
Consumers have the power to drive change by demanding sustainable choices from companies. By informing themselves about the origin of products and their associated water issues and supporting government and company action on water stewardship, they are in a position to push companies to work with responsible suppliers, to invest in sustainable solutions, and to take water resources seriously.

1 Global Water Challenges

Freshwater is key for life on earth, both for nature and humans. Clean, abundant water is fundamental to maintaining human well-being: for drinking, sanitation, agriculture, transport, electricity generation, recreation, and many religious ceremonies. At the same time, almost every human activity impacts freshwater: through the direct use of surface and groundwater for irrigation, industry, or domestic use; through the use of rain water for agriculture before it reaches our lakes, rivers, and wetlands; through changes to freshwater quality resulting from human activity; and through habitat fragmentation as a result of building dams and canals.

People already use 54 % of the planet's surface and groundwater (see Water Footprint vs. Water Risk). Estimates suggest that this may increase to 70 % by 2025 (Postel et al., 1996). In addition, freshwater is unevenly distributed across the planet. The Food and Agriculture Organization (FAO) estimates that by 2025, two-thirds of the world population will live in water-stressed areas[1], and climate change is expected to intensify the issue (IPCC, 2014).

Whilst the direct impacts of water use are local or regional, the drivers are often global as products and services are traded internationally

Whilst the direct impacts of water use are local or regional, the drivers are often global as products and services are traded internationally. Agricultural production accounts for 92 % of humanity's global water footprint. In developing countries, an estimated 90 % of wastewater is discharged directly into rivers and streams without treatment (Millennium Ecosystem Assessment, 2005). Much of this wastewater is generated in the production process of goods exported to other countries.

These developments heavily impact not only human well-being, but also nature. WWF's Freshwater Living Planet Index showed populations of freshwater species fell by 37 % between 1970 and 2010 – a larger decline than in marine and land ecosystems (WWF, 2014).

The economy is increasingly affected by these negative trends. The 2016 edition of the World Economic Forum's Global Risks Report rated water as the number one risk for the next ten years in terms of societal risk. Water's critical role in economic growth and development is increasingly acknowledged by all levels of society.

1 http://www.fao.org/nr/water/topics_scarcity.html

2 Switzerland's Water Risk

Switzerland has a very fortunate water situation. In comparison with other countries, sufficient water availability, good water quality, a strong regulatory framework and enforcement, as well as investments in water structures reduce the water risks for the production of goods and services in Switzerland.

However, Switzerland's economy depends heavily on trade. In 2015, Switzerland imported 52 million tonnes of goods worth CHF 244 billion[2]. Many of these goods originate in locations with water scarcity, deteriorating water quality, weak governance and regulatory challenges, poor infrastructure, vulnerable communities, or fragile ecosystems. Among Switzerland's top 10 trading partners are China and India, countries facing serious water issues[3]. Switzerland thus indirectly contributes to falling water tables or water pollution in these countries.

Switzerland indirectly contributes to falling water tables or water pollution in countries it is trading with

In turn, water-related issues and challenges in these countries inherently affect the Swiss economy. As most sectors depend on water resources for production, a company's performance often directly and indirectly depends on water availability. Water risks can jeopardise a company's production ability and, depending on likelihood and severity, can have financial implications (see box p.13). The 2015 Water Disclosure Report reveals that 50 % of Swiss companies (that replied) already experienced detrimental water-related business impacts in the reporting year[4].

Public awareness of the environmental impacts of production processes is increasing, and expectations of governments and companies to develop sustainable management strategies and equitably share water resources are growing. A multitude of stakeholders is affected by the water situation in a particular basin- farmers need water for irrigation and for their livestock; households need water for drinking, cooking and washing; companies need water for their production processes. To arrive at a sustainable outcome, it is imperative that all sectors – business, government, and civil society – collaborate. Due to its international trade and supply chains, the private sector plays a vital role in this context and needs to be actively engaged in current and future discussions – not only due to self-interest in ensuring future production, but also because of the sector's responsibility as a major economic player.

The water risks that Swiss companies are exposed to are threefold – physical risks, regulatory risks, and reputational risks. They can be basin or company related. For the former, the risks relate to conditions linked to a specific location and can only be influenced through collective action; whereas for the latter, they can be directly influenced by individual companies.

Companies must understand their water risks and strive to sustainably mitigate them. Companies focused on reducing their risks by improving the local situation (see Chapter 8) will be able to secure their investments in the long-term and strengthen their public image and reputation. Long-term customer relations, increased trust, and continuous effects – such as stable production volumes and quality – will be direct benefits for these companies.

2 www.swiss-impex.admin.ch, 30th of April 2016
3 http://www.bfs.admin.ch/bfs/portal/de/index/themen/06/05/blank/key/handelsbilanz.html
4 the response rate of Swiss companies was 38 %, www.cdp.net

Physical risks	**Basin**	Water quantity (availability, scarcity, flooding, droughts), quality (pollution) and ecosystem health (ecosystem vulnerability, biodiversity) within a river basin and the impacts this might have on companies, society, and the environment.
	Company	Water quantity and quality issues related to a company's performance and its supply chain.
Regulatory risks	**Basin**	Strength and enforcement of water regulations and the consequences of restrictions by public institutions. Potential for conflict or political disagreement over trans-boundary river basins or national political imperatives, such as trade restrictions on food crops with high water footprints.
	Company	The potential changes in pricing of water supply and wastewater discharge, water rights, quality standards, and license to operate for a particular company or sector. Particularly possible in times of crisis (induced by physical risk) when regulatory regimes are changed unpredictably or incoherently, or they are inconsistently applied due to political expedience or lack of integrity.
Reputational risks	**Basin**	Perceptions around water use, pollution, and behaviour that may have negative impacts on the company brand and influence purchasing decisions. Public perceptions can emerge rapidly when local aquatic systems and community access to water are affected.
	Company	When the actions of the company are poorly executed, understood, or communicated to local stakeholders and when perceptions and brand suffer as a consequence.

Table 1. *A general overview of water-related risks for companies*

In the following sections, Switzerland water risk for selected import sectors is analysed with WWF's water risk filter. The water risk of certain industries is presented and illustrated with case studies: rice in India and soy bean and beef in Brazil for the agriculture sector; the textile industry's water risk is exemplified by Bangladesh. The significance of water risk for the financial sector is also described. Possible pathways to Water Stewardship are identified to mitigate these risks. Finally, there is a call to action for various stakeholders to participate in reducing water risk: companies, governments, investors, and consumers.

Water Footprint vs. Water Risk

Each company has a so-called "water footprint", which is the total amount of water used when producing a good related to direct operations or supply chains. It takes into account the volumes of water consumed and polluted during different steps of the supply chain. A distinction is made between direct water use, referring to the volume of freshwater consumed by a business within a local production process, and indirect water use, referring to freshwater embedded in products from earlier stages of the supply chain (WWF-Switzerland, 2012).

The water footprint does not necessarily correlate with water risk

Between 1996 and 2011, the water footprint of goods consumed in Switzerland increased by 60 %, mainly driven by imports, meaning that most of the increase in water consumption did not take place domestically but in other countries where the goods were produced (BAFU 2014). As the dependence of the Swiss economy on water availability outside of the Swiss government's sphere of influence is increasing, so is the necessity for producing companies to get involved in the management of the water basins the operate in.

However, there is an important difference between water footprint and water risk. The water footprint does not necessarily correlate with water risk. For example, risk may arise even if a company is using a small amount of water but is located in an area with a highly unreliable water supply. A company located in an area where water is plentiful may still be facing high water risk because of poor governance. If a company is focused on reducing its footprint without looking at risk, it may succeed in becoming more efficient but fail to reduce its risk.

Impacts of Water Risks on Companies

If water risks materialise, they can affect business performance in a number of ways. Physical risks such as drought or deteriorating water quality can lead to reductions in production volume that may force a company to raise the product's price, potentially leading to lower sales. If water becomes unavailable in the necessary quantity or quality, companies may find themselves forced to cease their operations in that location.

Businesses operating in regions with weak regulatory water frameworks or weak enforcement may find themselves subject to changed water pricing, fines or penalties if this situation changes. The resulting financial impacts may have to be absorbed, lowering turnover, or counterbalanced by raising product prices, which may negatively affect sales. Companies operating in locations with conflicts over water rights may find themselves in the crossfire of these conflicts and be forced to abandon their operations.

A company's reputation may suffer from real or perceived negative impacts of its water-related activities. For instance, conflicts over water rights with indigenous populations may create much media attention, tarnishing the company's name. As a consequence, customers may distance themselves from the company by not buying its products, thereby negatively affecting turnover.

3 Methodology

This study is based on an analysis of the 2015 import statistics published on Swiss-Impex on the 30 April 2016[5] as well as calculations done with the Water Risk Filter[6]. Throughout the report, authors used the exchange rates from 1 January 2016 to convert all financial figures to Swiss Francs.

Calculations of the most important Import Sectors

Data from Swiss-Impex were allocated to the 34 different industries from the water risk filter. The four most important sectors, as defined by import volume (kg), were identified. The agriculture data was segregated into 120 different commodities and the eleven most important commodities (by import volume) were identified. Although textiles and apparel were not among Switzerland's top four import sectors, they were included in the study due to their extremely high impact on important watersheds (BAFU 2014). For each sector and agriculture commodity, the most important sourcing countries were identified. As the top ten importing countries in the forestry and paper sectors are all within Europe and thus have a low over all water risk, this sector was not included in the study. However, as part of the sector –pulp and paper – presents a high water risk, a chapter was included on this specific aspect. Finances were also included due to their importance in the Swiss economy. In this report, four sectors are presented for illustration (for a more comprehensive representation please see WWF Switzerland's Report: The Imported Risk[7]).

For every country and commodity combination, the water risk was calculated using the WWF Water Risk Filter

Calculations of the Water Risk

For every country and commodity combination, the water risk was calculated using the WWF Water Risk Filter, i.e. the tool's basin related water risk assessment. Results were further aggregated to the country level to obtain minimum, maximum, and area averaged[8] overall water risk scores per country. The WWF Water Risk Filter assesses a basin's and facility's or commodity's physical, regulatory, and reputational water risks using a set of 87 different indicators (see The Water Risk Filter Tool). Risk scores varied between 1 (no/low risk) and 5 (very high risk)[9]. If the risk scores varied across a country, the maximum value was used.

5 www.swiss-impex.admin.ch
6 http://waterriskfilter.panda.org
7 wwf.ch/water-risk
8 The WWF Water Risk Filter methodology uses weighted averages to aggregate risk indicators to an overall water risk score (i.e. every indicator and risk types have an individual weight). In a standard Water Risk Filter assessment, the data resolution is at the sub-basin level (area). For this study, the country level water risk was summarised using the area risk levels multiplied by the percentage of the areas as part of the whole country (i.e. area weighted average). In addition to the area weighted average, minimum and maximum risk levels within a country were calculated. In particular for large countries, risk levels are expected to vary dramatically since water issues are often local issues. The minimum, area weighted average, and maximum water risk is used to provide an indication of the risk distribution within a country.
9 Categories: Low Risk = 1 – 2.249; Medium Risk = 2.25 – 3.49; High Risk = 3.5 – 5

Methodological Limitations

For all sectors presented, top import countries may include countries that are not the origin of the respective good or commodity. In these cases, a country imports goods and then re-exports them without further processing. For example, Germany is a major re-exporter to Switzerland, as is the case in the textiles and apparel, extractives, agriculture, and chemical sectors.

The possibility exists that particular risk scores for particular country / commodity combinations are overestimated since the maximum risk value was used in instances of variable score results.

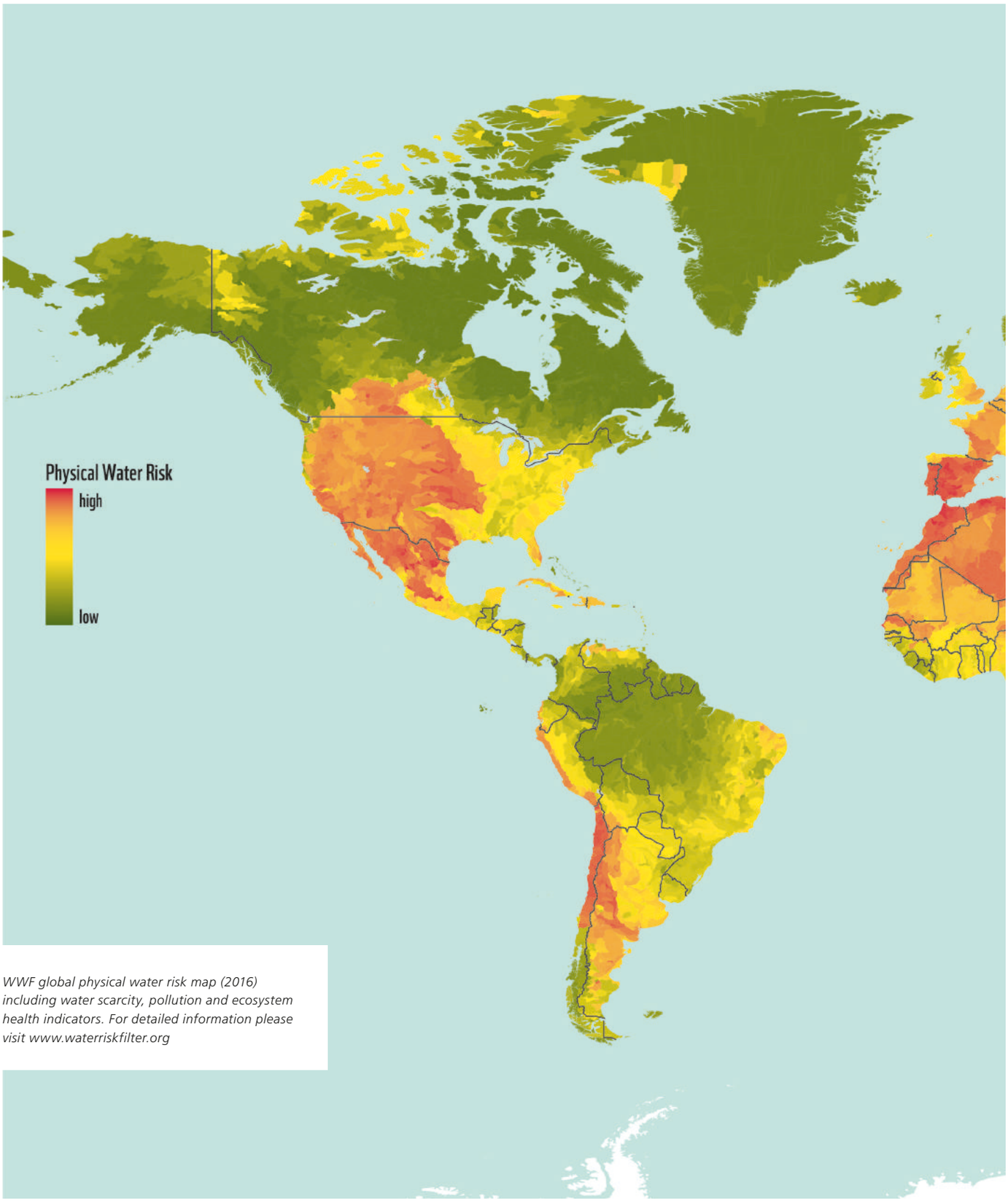
The Water Risk Filter Tool

In a world of growing disclosure demand, WWF/DEG's Water Risk Filter is one of various and continuously evolving tools to help assess business' water risk. It supports the user to identify risk hotspots as a starting point for developing further steps to become a good water steward.

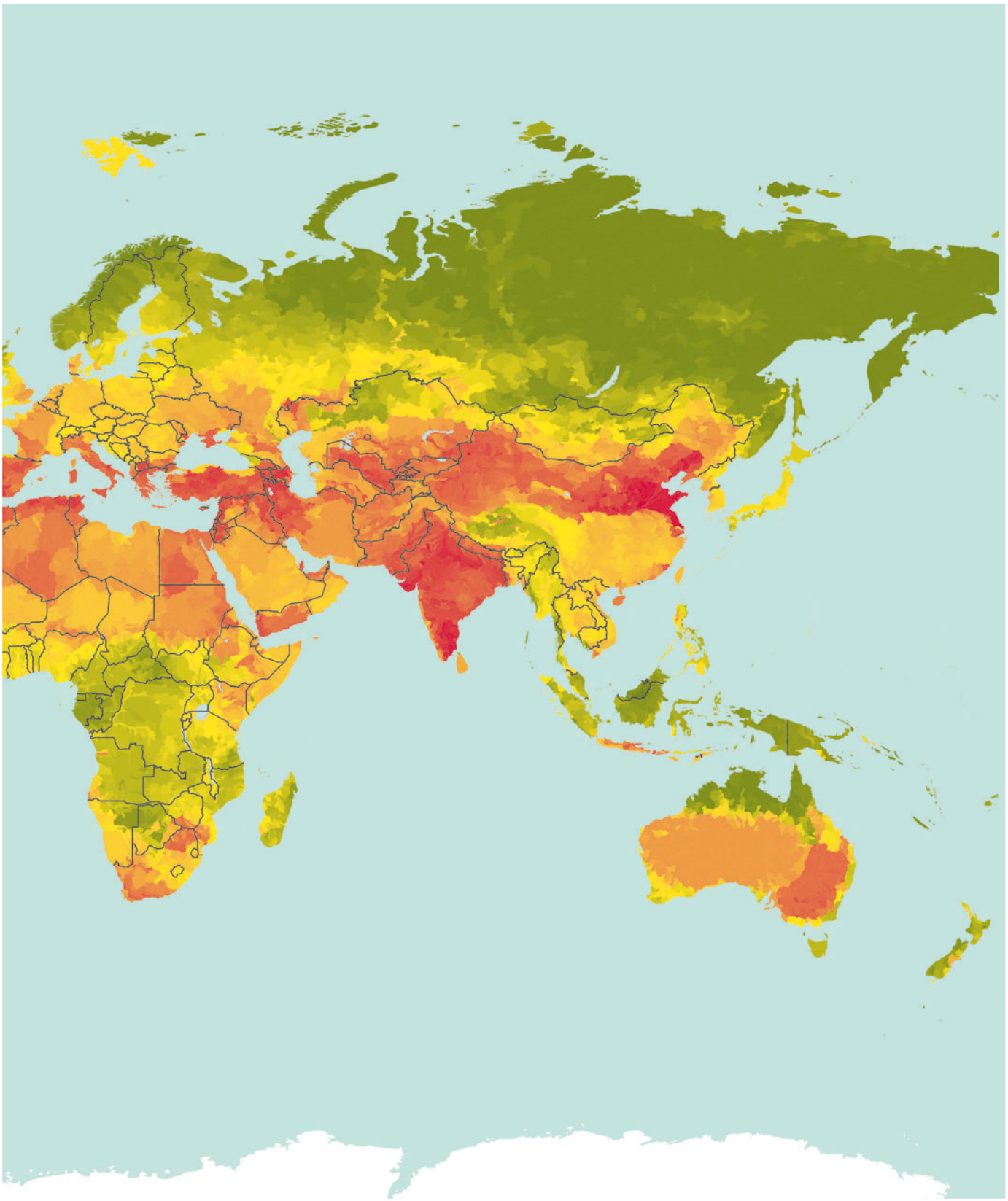
The Water Risk Filter is a free online tool that bases its assessment on indicators of a facility's surrounding (basin related risk) as well as operational aspects (company related risk). This is done by guiding the user from the assessment through to the tool's mitigation toolbox, case studies, and country water profiles. The assessment consists of a local evaluation based on global datasets for the basin related risk and of a questionnaire addressing one's operational water risk at the facility level.

It empowers companies and investors to make informed decisions that avoid negative impacts to the company, surrounding communities, and other water users. The results can inform internal water management processes and help develop location specific water risk mitigation measures.

www.waterriskfilter.org



WWF global physical water risk map (2016) including water scarcity, pollution and ecosystem health indicators. For detailed information please visit www.waterriskfilter.org



4 Agriculture

In 2014, agricultural products made up 9.5 % of world trade in merchandise; Switzerland imported CHF 13.85 billion of agricultural products or 5.1 % of the Swiss economy's total merchandise imports (WTO, 2015). Physical water risk poses the greatest threat to Switzerland's agricultural imports, closely followed by reputational risk.

Sector Water Risk and Water Intensity

One-third of total food production is found in areas of high or extremely high water stress

Roughly 70 % of the surface and ground water used globally is for agriculture, with 94 % of water dedicated to agriculture in least developed countries (UN, 2012; FAO, 2011).

Currently, one-third of total food production is found in areas of high or extremely high water stress (Roberts & Barton, 2015, see also figure 1). Competition for water, weak regulation, aging or inadequate infrastructure, water pollution, and climate change and weather variability are the main water risk drivers affecting the water security of the food sector (ibid.). Climate change is likely to affect water supply and agriculture, as it will change the seasonal timing of rainfall and snow melt, and increase the frequency and severity of floods and droughts[10].

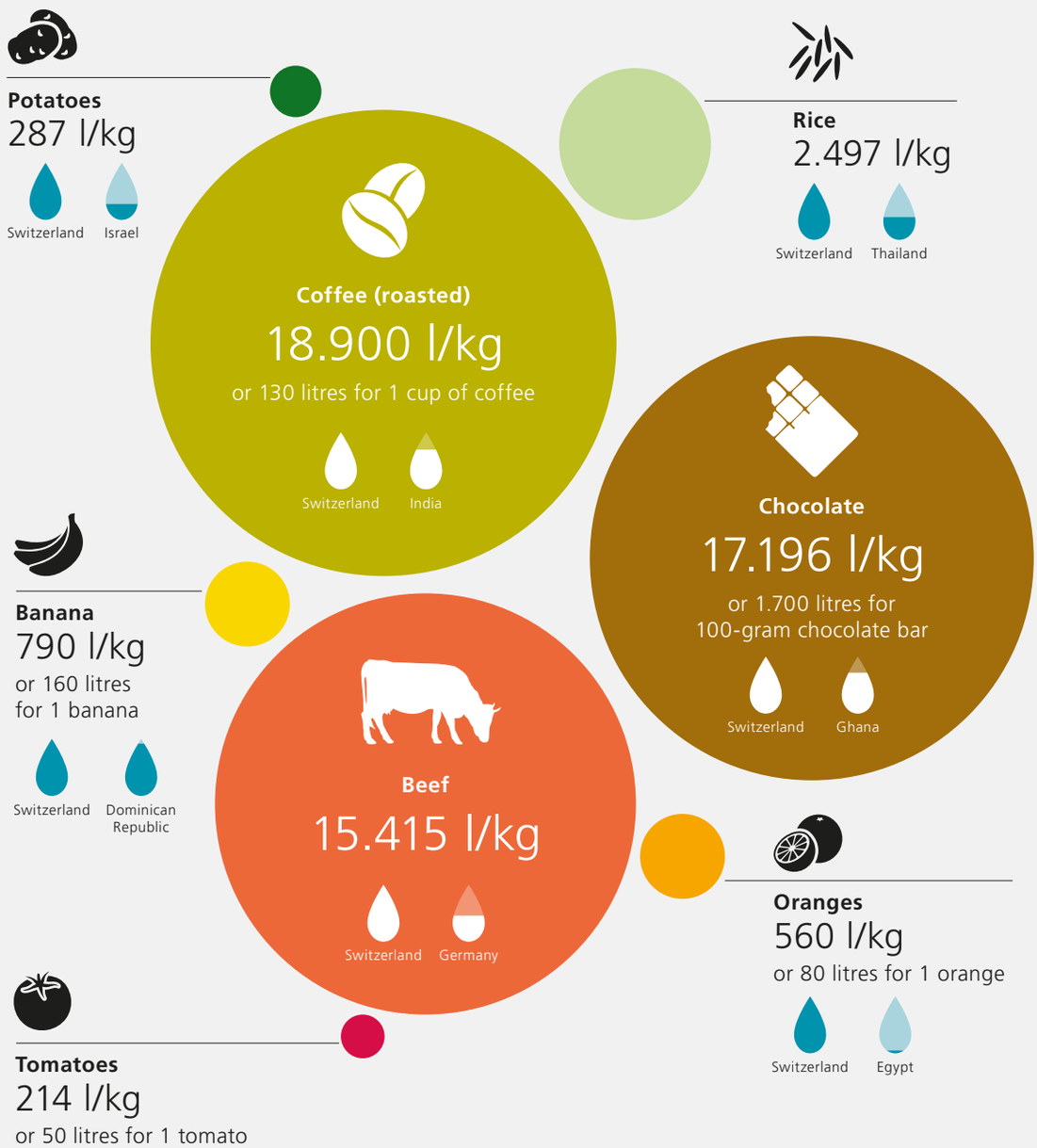
Many big food producing countries like the US, China, India, Pakistan, Australia and Spain have reached, or are close to reaching, their renewable water resource limits. The main causes of wasteful and unsustainable water use are leaky irrigation systems, wasteful field application methods and the cultivation of thirsty crops not suited to the environment[11].

Agriculture is one of the main causes of water pollution with the most important problems stemming from excess nutrients accumulating in surface and coastal waters, nitrate accumulating in groundwater, and pesticides accumulating in groundwater and surface-water bodies (Metabolic, 2016; FAO, 2011). At the same time, the sector is dependent on good quality water resources in order to avoid contamination of crops.

Although Switzerland has abundant water resources and they are well managed, Swiss manufacturers and retailers can face significant water-related risks if agricultural raw materials are imported from regions experiencing water problems. Prominent examples are the food and beverage sectors that are heavily dependent on water for production of their input and final good.

10 http://www.oecd.org/agriculture/wateruseinagriculture.htm
11 http://wwf.panda.org/what_we_do/footprint/agriculture/impacts/water_use

Average Water Footprints for some of Switzerland's imported Agricultural Goods[12]:



12 http://waterfootprint.org/en/resources/interactive-tools/product-gallery
13 FAO. 2016. AQUASTAT Main Database, Food and Agriculture Organization of the United Nations (FAO). http://www.fao.org/nr/water/aquastat/data/query/

Commodity	Import quantity (kg)	Import value (CHF)	Country	Percentage of Import Quantity	Physical risk	Regulatory risk	Reputational risk
Wheat and Meslin	397,284,830	125,132,150	Germany	31 %	🟠	🟢	🟠
			France	29 %	🔴	🟢	🟠
			Austria	16 %	🟠	🟢	🔴
			Canada	15 %	🟠	🟢	🔴
			Czech Republic	2 %	🟠	🟠	🟠
Soya beans & Oilcake + other solid residues	287,073,105	157,192,376	Brazil	58 %	🔴	🟠	🔴
			Russia	16 %	🔴	🔴	🟠
			Netherlands	8 %	🟠	🟢	🟠
			Italy	7 %	🔴	🟢	🟠
			China	3 %	🔴	🔴	🔴
Coffee	159,339,432	752,515,999	Brazil	28 %	🔴	🟠	🔴
			Colombia	16 %	🟠	🟠	🔴
			Viet Nam	9 %	🔴	🟠	🔴
			India	8 %	🔴	🟠	🔴
			Costa Rica	6 %	🟠	🟠	🟠
Rice	126,200,077	90,228,532	Brazil	43 %	🔴	🟠	🔴
			Italy	19 %	🔴	🟢	🟠
			Thailand	13 %	🔴	🟠	🟠
			India	12 %	🔴	🟠	🔴
			Spain	2 %	🔴	🟢	🟠
Banana	88,618,697	103,097,062	Panama	41 %	🟠	🟠	🟠
			Colombia	19 %	🟠	🟠	🔴
			Peru	13 %	🔴	🔴	🟠
			Ecuador	12 %	🔴	🟠	🟢
			Dom. Republic	8 %	🟠	🔴	🟢
Oranges	69,219,278	68,800,394	Spain	60 %	🔴	🟢	🟠
			Italy	27 %	🔴	🟢	🟠
			South Africa	9 %	🔴	🟠	🟠
			Portugal	1 %	🔴	🟠	🟠
			Egypt	1 %	🔴	🟠	🔴

Table 2. *Switzerland's main agricultural imports from the top five importing countries and their associated water risks*[14]

14 Swiss Impex, accessed on April 2016

Commodity	Import quantity (kg)	Import value (CHF)	Country	Percentage of Import Quantity	Physical risk	Regulatory risk	Reputational risk
Cocoa beans	44,087,475	143,257,874	Ghana	50 %	🟠	🔴	🟠
			Ecuador	25 %	🔴	🟠	🟢
			Côte d'Ivoire	13 %	🟠	🔴	🟠
			Madagascar	4 %	🟠	🔴	🟢
			Venezuela	2 %	🔴	🔴	🟠
Tomatoes	39,063,663	77,443,816	Spain	44 %	🔴	🟢	🟠
			Italy	18 %	🔴	🟢	🟠
			Morocco	17 %	🔴	🔴	🟠
			Netherlands	13 %	🟠	🟢	🟠
			Belgium	4 %	🟠	🟢	🟠
Grapes	38,629,551	83,572,501	Italy	63 %	🔴	🟢	🟠
			South Africa	9 %	🔴	🟠	🟠
			Turkey	7 %	🔴	🟠	🟠
			France	7 %	🔴	🟢	🟠
			Spain	3 %	🔴	🟢	🟠
Potatoes	37,810,327	15,231,608	Germany	31 %	🟠	🟢	🟠
			Netherlands	27 %	🟠	🟢	🟠
			Israel	18 %	🔴	🟠	🔴
			France	14 %	🔴	🟢	🟠
			Belgium	5 %	🟠	🟢	🟠
Meat of bovine animals	25,983,234	196,952,645	Germany	44 %	🟠	🟢	🟠
			Austria	12 %	🟠	🟢	🔴
			Ireland	8 %	🟢	🟢	🟢
			Uruguay	8 %	🟢	🔴	🟠
			Brazil	4 %	🔴	🟠	🔴

Country Case

Rice Production in India

Share of global production
(Government of India, 2015)

21.38 %

Share of imports to Switzerland[15]

12.12 %

After China, India is the second largest rice producer[16]. In 2012, India produced 157.8 million tonnes of rough rice on 42,410,000 hectares or 14 % of India's landmass (Government of India, 2015), an area more than ten times the size of Switzerland. Rice is India's most exported commodity – exports in 2013 totalled over 11.3 million tonnes worth CHF 8.14 billion (US$ 8.2 billion)[17].

Rice is grown on more than a quarter of India's cultivated land under four systems: irrigation, rain-fed uplands, rain-fed lowlands and flood prone[18]. In 2011–12, 58.7 % of India's rice production came from irrigated systems (Government of India, 2015). The eastern states have the highest intensity of rice cultivation under mainly rain-fed conditions in the basins of the Ganges and Mahanadi rivers. The majority (84 %) of India's rice crop is cultivated during the winter monsoon season, though a small share is also grown in the summer season with irrigation (9 %)[19].

Water Situation

India's two main water sources are rainfall and glacial snowmelt from the Himalayas. About 80 % of India's river flow occurs during the four to five months of the monsoon season[20]. Many areas experience localised and severe water shortages from March to June and are then subject to flooding during the monsoon. Water resource availability and exploitation across India are also highly variable due to climate and social factors. Although most rivers are of good quality in their upper reaches, water use and pollution in cities, agriculture and industries, and the lack of wastewater treatment plants in the middle and lower reaches of most rivers causes major degradation of surface water quality. Nearly 80 % of untreated urban wastewater ends up in rivers (WWF India,

15 Swiss Impex, accessed on April 2016, tariff head 1006 - Rice, tariff head 1008.9024 - Wild rice Zizania aquatica, for human consumption, out of tariff quota
16 www.faostat.fao.org
17 ibid.
18 http://farmer.gov.in/imagedefault/pestanddiseasescrops/rice.pdf
19 ibid.
20 Water Risk Filter: India

2013). Additionally, salt-water intrusion in coastal aquifers due to groundwater over-exploitation affects farmers' and agribusiness' operations.

After two years of poor monsoons, India was dealing with potentially its worst ever water crisis in 2016. At least 330 million people were affected by a severe drought with 91 reservoirs left with only 29 % of their total storage capacity in April 2016 (BBC, 2016).

Water has become the greatest constraint in cultivating more rice to meet India's increasing demand and future food security

In India, 90 % of the total water withdrawn is for agriculture. 70 % of this is allocated to rice cultivation,[21,22] although this takes up only one fourth of India's arable land. Water has become the greatest constraint in cultivating more rice to meet India's increasing demand and future food security, which is under threat unless the government intensifies production by two million tonnes annually (Jishnu et al., 2010).

India's agricultural sector is dominated by small, marginal holdings with low levels of mechanization – 80 % of India's farmers have less than one hectare of land (Africare et al., 2010). Levels of irrigation efficiency are low, as inadequate attention has been given to irrigation schemes' maintenance and government agencies do not have the resources to support India's increasing number of marginal farmers. As a result, the government has integrated farmers into the management of irrigation systems through Participatory Irrigation Management (PIM) and Water Users' Associations (WUAs), most recently through India's 2012 National Water Policy. As of 2014, 25 of India's 28 states have adopted the PIM approach partially or fully by forming WUAs (Sinha, 2014).

Physical Risks

India is in a state of water stress, which is defined as annual water supplies below 1,700 m3 (equivalent to the capacity of 17 bathtubs) per person. In 2014, India's renewable internal freshwater resource was 1,116 m³ per person[23]. Before 2025, India is expected to reach a state of water scarcity with overall per capita water availability falling below 1,000m³[24] (UNEP FI, 2009). It is estimated that 10.4 million hectares of irrigated rice, or almost one quarter of India's area under rice cultivation, will experience 'physical water scarcity' by 2025 (Tuong & Bouman, 2003).

Climate change is considered the greatest threat to India's economy (Krishnan & Beniwal, 2015). Climate change will affect both rain-fed and irrigated rice yield through changes in precipitation, temperature and water availability (Nelson et al., 2009). During severe drought years, average yield reduction in rain-fed, drought-prone areas has ranged from 17–40 %[25]. It is estimated that by 2050, climate change will increase rice prices by an additional 32–37 %, due to a decline in supply and higher production costs caused by investments in climate change adaptation measures (Nelson et al., 2009).

Irrigated rice is characterised by high cropping densities and intensive use of agrochemicals, energy, and water. Irrigated agriculture across India is vulnerable to falling groundwater tables and the decreasing quality of these resources. As a result of unreliable and declining surface water supplies, farmers and urban dwellers pump groundwater

21 http://www.sri-india.net
22 http://www.fao.org/nr/water/aquastat/maps/World-Map.WithA.Twith_eng.htm
23 http://data.worldbank.org/indicator/ER.H2O.INTR.PC
24 see http://indiawatertool.in/ for demand and availability projections in 2025
25 http://irri.org/news/hot-topics/rice-and-climate-change

unchecked – more than 60 % of irrigated agriculture and 85 % of drinking water supplies stem from extracted groundwater (World Bank, 2012).

Improperly developed irrigation schemes can lead to poor soil drainage, which causes problems of water-logging (Tran, 1997). Water-logging of soils has already left vast areas unproductive throughout India (Panigrahi et al., 2015).

Regulatory Risks

Local and national water regulations in India are not well-defined or changing in many places. Companies operating in India have to be aware that they are potentially subject to water supply uncertainties or conflicts over water use associated with a changeable regulatory environment.

The use, management, and ownership of water are often linked to land or irrigation structures rather than to the resource itself; hence property rights to water are poorly defined. As a consequence, legal disputes over water are often complex and costly (UNEP FI, 2009).

Although under the 2012 National Water Policy farmers have been integrated into the distribution and management of irrigation systems – through Participatory Irrigation Management (PIM) and Water Users' Associations (WUAs) – results have been mixed. In cases where they're implemented in a top-down approach, they have failed to take off (Sinha, 2014)[26]. In places where WUAs are not functional and water management responsibilities are unclear, conflict over water use may occur.

To improve India's food security in the mid-1960's, policies were instituted to create a minimum support price and input subsidies for farmers (Mohanty, 2015). These policies still remain in place. Especially in arid areas with unreliable water supply, the government heavily subsidises farmers' electric pumps and does not regulate how much groundwater is extracted (Shiao et al., 2015).

India shares several trans-boundary rivers with Pakistan, Bangladesh, and Nepal. Water-sharing agreements can be a source of tension, especially as complicated political issues between India and its neighbours often make water issues seemingly problematic (e.g. Jayaram, 2013, Rowlatt 2016).

Reputational Risks

Companies are facing increasing reputational risk when operating in water-stressed regions in India. Because of farmers protesting about decreasing supplies, an international beverage company aborted a CHF 23.8 million (US$ 24 million) expansion in Uttar Pradesh state, citing delays in water abstraction permits (Chaudhary, 2015).

26 for an extensive review of why WUAs fail or succeed in India, see http://wrmin.nic.in/writereaddata/PIM11.pdf

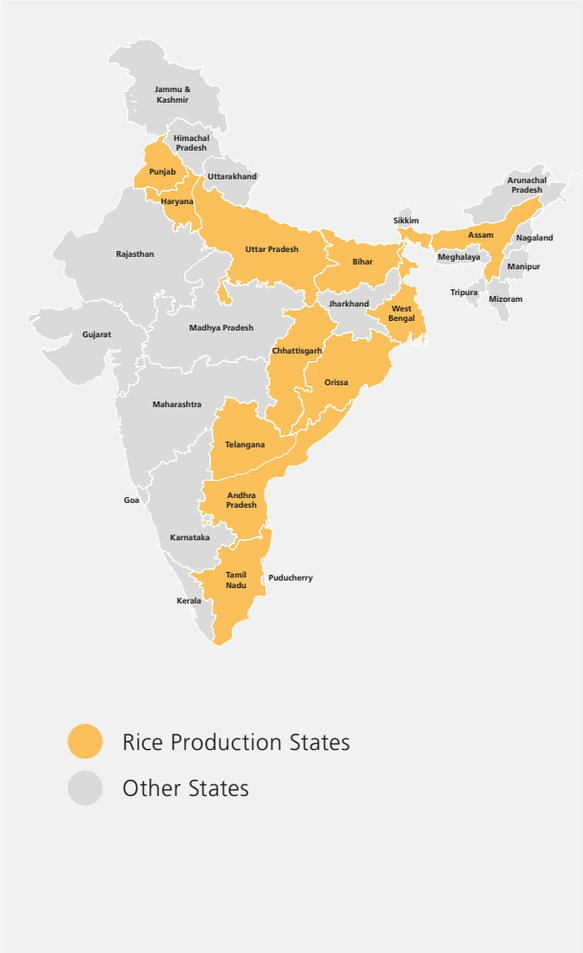


Figure 1. *Rice cultivation in India*[27]

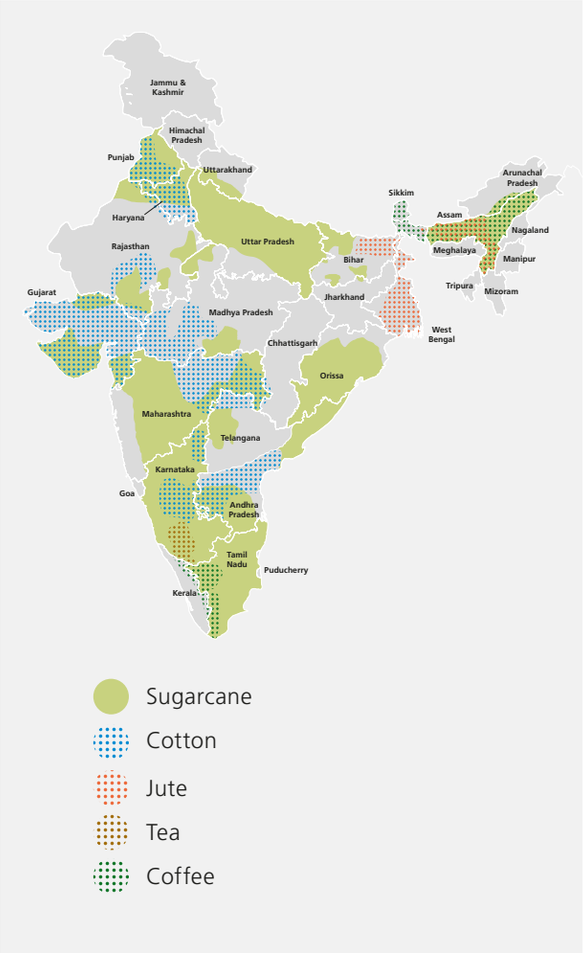


Figure 2. *Commercial crop cultivation in India*[28]

27 adapted from: http://www.mapsofindia.com/top-ten/india-crops/rice.html
28 adapted from: http://www.mapsofindia.com/indiaagriculture/commercialcrops.htm

Water Stewardship in Rice Production[29]

Despite the availability of proven practices and technologies for reducing water consumed for rice irrigation, it has been shown that the adoption of these by farmers is constrained by a) lack of awareness, know-how and guidance; b) insufficient incentive mechanisms to stimulate adoption and c) lack of appropriate governance structures to ensure sustainable water management and distribution.

The Rice WAPRO project, implemented, among others, by Helvetas Swiss Intercooperation Schweiz and Intercooperation India in Uttarakhand, India, therefore works with three components to address each of these restraining factors:

The "PUSH" component builds the farmers' awareness and understanding about available technologies, by establishing promotion and advisory services for farmers, which include training and tools to support the adoption of best available technologies and practices.

The "PULL" component develops incentives for farmers to change their irrigation and production practices. This involves engaging private sector partners (Nature Bio Foods, COOP und Reismühle Brunnen) to create effective incentive mechanisms for farmers by improving market access, and by offering premium prices and technical support for those farmers who improve their water efficiency.

The POLICY component applies the Alliance for Water Stewardship (AWS) Standard[30] by linking farmers, households and other water users together to write water-use plans that facilitate equitable access to water and its timely distribution. At the same time, the framework focus efforts to reform local and national regulations and policies to achieve greater water security.

The project is currently working with 4,500 farmers, both women and men, the majority of whom have already increased the proportion of land cultivated under water efficient practices. Moreover, a multiplier effect has been observed, as non-project participant farmers are also adopting these practices.

29 https://www.helvetas.org/projects___countries/projects/keystone_projects/projects_in_asia/multi_stakeholders_join_forces_to_enhance_water_productivity_using_a_push_pull_policy_approach/index.cfm
30 http://www.allianceforwaterstewardship.org

Country Case

Cattle and Soy Oilcake Production in Brazil

Share of global production

Cattle	Soy oilcake
16.4 % (USDA FAS, 2016)	21 %[31]

Share of imports to Switzerland

Cattle	Soy oilcake
4.44 %[32]	58.49 %[33]

In 2015, Brazil was the second largest producer of beef and veal and the third largest exporter (USDA FAS, 2016). At the end of 2012, Brazil's 211.3 million cattle occupied 172 million hectares – which is approximately equivalent to Switzerland, Germany, Italy, Austria, and Spain combined – or 70 percent of Brazil's agricultural land (Heinrich Böll Foundation and Friends of the Earth Europe, 2014). Brazil's Ministry of Agriculture projects beef production to increase at a rate of 1.9 % and exports to increase at a rate of 3.4 % between 2014–2024 (Brazil Ministry of Agriculture, Livestock, and Food Supply, 2014).

In 2015, over 97 million tonnes of soybean were harvested on 32.1 million hectares of land in Brazil, mainly under rain-fed conditions[34]. Brazil's Ministry of Agriculture projects a 36.9 % increase in production and a 44 % increase in exports between 2014–2024 (Brazil Ministry of Agriculture, Livestock, and Food Supply, 2014).
When soy is pressed, about 20 % of oil can be generated while the remaining 80 % is leftover as cake, which is mainly used for animal feed. In 2014, Brazil exported over CHF 6.95 million worth of soy oilcake and other solid residues[35].

Brazil's centre-west and southern states have higher rainfall, better soils and more developed infrastructure (OECD & FAO, 2015). The northeast and the Amazon basin area lack well distributed rainfall and good soils; however, cheap land prices are causing a land rush. As the soils of tropical rainforests are not very fertile due to thin topsoil and a lack of soluble minerals[36], deforested areas can only be used temporarily as pastures, after which soybean producers take over the worn-out cattle pastures and ranchers move deeper into the forest. Ranchers sell their land to soy farmers at high prices only to re-invest in clearing forested land elsewhere (WWF, 2014b). Ultimately, it is more

31 based on own calculation, FAOStat data
32 Swiss Impex, accessed on April 2016, tariff head 0201 - Meat of bovine animals, fresh or chilled, tariff head 0206.29 - Frozen edible bovine offal (excl. tongues and livers), tariff head 0202 - Meat of bovine animals, frozen, tariff head 0206.22 - Frozen edible bovine livers, code 0206.10 - Fresh or chilled edible offal of bovine animals, code 0206.21 - Frozen edible bovine tongues
33 Swiss Impex, accessed on April 2016, tariff head 1201 - Soya beans, whether or not broken, code 2304 - Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil
34 http://www.ibge.gov.br/english/estatistica/indicadores/agropecuaria/lspa/defaulttab.shtm
35 http://www.ers.usda.gov/media/295642/wrs013f_1_.pdf
36 http://www.globalchange.umich.edu/globalchange1/current/lectures/kling/rainforest/rainforest.html

profitable to slash and burn forests than to replant fallowed fields (Tollefson, 2015). This trend has negative effects on the region's water regime (see following Box on the link between deforestation and water).

The Link between Deforestation and Water

A WWF study on the "State of the Amazon"[37] found that deforestation over large areas may reduce rainfall, alter rain seasonality, and decrease dry season stream flow. Intact Amazon and Cerrado habitats enjoy heavy rainfall. One quarter of this runs off into the Atlantic Ocean and three quarters evaporate into the atmosphere. The evaporated water is carried further inland to again come down as rainfall. In deforested areas, the runoff/evaporation ratio is reversed with only one quarter evaporating and being carried further inland. Deforestation as a result of farming or cattle ranching reduces the amount of rainfall that can be recycled inland (Brown, 2005). Clearing forests is thus weakening the water recycling mechanism that brings water to the agricultural regions of south-central Brazil (ibid.).

Water Situation

Clearing forests is weakening the water recycling mechanism that brings water to the agricultural regions of south-central Brazil

While Brazil is considered rich in water – 12 % of the world's surface water resources are located in the country – it is unevenly distributed among regions[38]. The Amazon River basin covers 48 % of the country's territory and accounts for 68 % of Brazil's freshwater resources but only 12 % of the population lives here. On the other hand, 3 % of the country's water resources are in the northeast, which is subject to recurrent severe droughts, harvest failures, and food shortages for 28 % of Brazil's population. The northeast's limited water resources are a severe constraint to agriculture, but large public-sector irrigation schemes are being constructed. Of Brazil's 12 hydrographical regions, the Amazon and the Tocantins-Araguaia basins in the north account for 56 % of Brazil's total drainage area.

Groundwater is being used on a large scale in areas where surface water sources are scarce, heavily used, or where their use is problematic due to serious water pollution (as in central and southern Brazil)[39]. Irrigation accounts for 72 % of Brazil's water use (Glickhouse, 2015). Particularly in the northeast, ineffective irrigation is causing salinisation and drainage problems, which reduces these lands' productivity[40].

Sewage is a major cause of water pollution that affects quality of life, health, and economic development in large metropolitan areas[41].

Deforestation also impacts the balance between the water on land and water in the atmosphere, which results in changes in precipitation and river flow (see Box on the link between deforestation and water).

37 Charity et al., 2016
38 Water Risk Filter: Brazil
39 ibid.
40 ibid.
41 ibid.

Figure 3. *Cattle density in Brazil*[42]

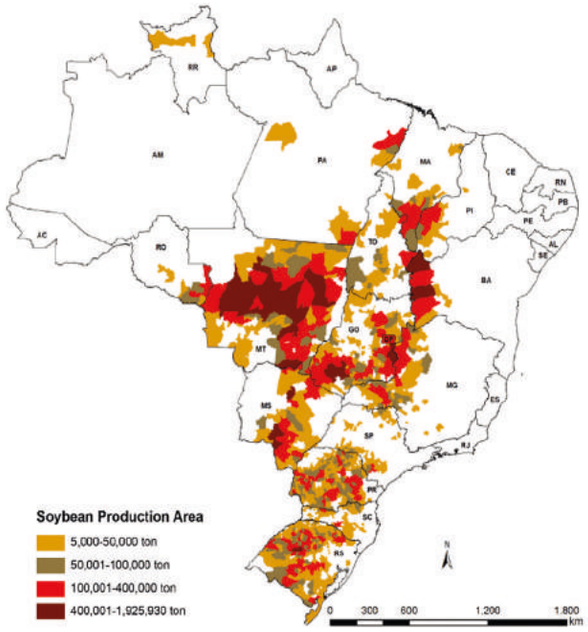


Figure 4. *Soy cultivation in Brazil*[43]

2014 saw Brazil's worst drought in at least 80 years that severely impacted economic output. Water was rationed to nearly 6 million people in a total of 142 cities across 11 Brazilian states as average reservoir levels in the southeast and central-west regions fell to 41 % (RT, 2014).

Physical Risks

Including the indirect water footprint of animal feed and the direct water footprint related to drinking water and service water consumed, Brazil's livestock industry's average water footprint is 19,488 litres/kg[44] (Mekonnen & Hoekstra, 2010), which is roughly equivalent to the capacity of a milk tanker. The average water footprint of Brazilian soy is 2,018 litres/kg (the capacity of about 20 bathtubs) (Willaarts et al. 2011). High water requirement can pose a physical risk when water gets scarce. As a result of the 2014 drought, soy production shrank 17 % and the cost of beef went up 22 % (Glickhouse, 2015).

42 www.boell.de/meatatlas – cc_by_sa_3.0_ Heinrich-Böll-Stiftung/Atlasmanufaktur; https://creativecommons.org/licenses/by-sa/3.0/de/
43 http://news.agropages.com/News/NewsDetail---19091.htm
44 The most substantial element of the animal water footprint stems from the feed given to the cattle. As a result, country footprints differ from the global average due to this and the differences between the three production systems (grazing, mixed, and industrial) employed in each country.

Water pollution caused indirectly by fertilizer and pesticide run-off from pastures or feed grain production, and directly by manure, is a major issue in the livestock industry. Furthermore untreated slaughterhouse run-off can damage freshwater sources and negatively impact public health, while eutrophication of water systems can cause large-scale algal blooms that kill aquatic life (WWF-EPO, 2006).

The combination of high rainfall interception in soybean fields (rain that does not reach the ground because it is intercepted by leaves and branches) with fast run-off due to soil compaction reduces the amount of water percolating into deeper soils and groundwater (WWF, 2014b). A lack of soil cover and deficient protection from the wind in soy production leads to erosion and infertile soils, which in turn, leads to increased fertilizer use (WWF, 2006). Large-scale use of synthetic fertilizers and pesticides can pollute ground and surface water.

Future production will need to meet a growing population's hunger and changing diet towards more meat

Future production will need to meet a growing population's hunger and changing diet towards more meat, which will require more feed; however a reduction in rainfall (as a result of deforestation, climate change, La Niña dryer years) for a mainly rainfed crop will require an ever-greater dependence on irrigation. The lack of a well-defined national irrigation plan, infrastructure regarding water and energy availability, and accessible credit for irrigation are current limiting factors (Sentelhas et al., 2015).

Regulatory Risks

Regulatory risks for companies operating in Brazil can arise from potential conflicts between forest protection laws and policies to boost the country's soy industry.

Though Brazil has various laws protecting its forests, the most important is the Forest Code, which relates to private farms. Under this law and when enforced, landowners in the Amazon are obliged to maintain 80 % forest cover, while landowners in Cerrado savannah regions within the area legally classified as the Amazon biome are supposed to maintain 35 % of land under natural vegetation. In other Cerrado regions, the figure is 20 % (WWF, 2014b). For public land, there is an extensive protected area network in the Amazon, and smaller protected area systems in the Cerrado.

At the same time, Brazil is building new highways and ports connecting soybean farms to domestic and international markets in an effort to make soy exports more competitive. Weak governance in frontier regions will most likely exacerbate deforestation, especially along newly paved highways (WWF, 2014b).

Reputational Risks

As a result of Greenpeace's international campaigns against soy and beef purchased from deforested lands in the Amazon, Brazil's major soy exporters and slaughterhouses were pushed to declare moratoria on the purchase of soy and beef from illegally cleared forests. Originally passed in 2006 and renewed annually, Brazil's Soy Moratorium, which prevents the sale of soy linked to deforested Amazon crops, was renewed indefinitely on May 9, 2016[45]. In 2009, it was followed by a similar moratorium involving beef

45 http://www.greenpeace.org/usa/news/brazilian-soy-moratorium-renewed-indefinitely

(Boucher 2014). These developments made it quite clear that traders and retailers associated with deforestation faced a major reputational risk. Should another campaign be launched highlighting Brazil's top soy and livestock producing states ultimate impact on the nation's water supply, market response has proven swift and effective.

Conflicts over water use occur in regions of high population density and industrialization, where water demand exceeds supply. Conflicts over water use by animal production have occurred in many of Brazil's top cattle and soy producing regions. In some river basins, the percentage of water used for livestock is relatively high: 32 % in the Amazon basin, 18 % in the North West basin, and 16 % in the Tocantins- Araguaia basin (Doreau et al, 2013).

The Round Table on Responsible Soy, WWF and the Swiss Soy Network (Soja Netzwerk Schweiz 2016, WWF 2016)

The Round Table on Responsible Soy (RTRS[46]) is an international multi-stakeholder initiative founded in 2006 that promotes the use and growth of responsible production of soy. Among its members are WWF, Coop, Migros, Nestlé, Unilever and many others. In Mato Grosso, where one third of Brazil's soy is grown, the conversion of the Amazon forest and Cerrado savannah is the most important environmental cost of agro-livestock expansion (Pacheco, 2012). Here, WWF and others work with eight local soy farmers under the project "People who Produce and Preserve", to promote sustainable soy farming according to RTRS criteria. RTRS certified soy cannot be grown on land converted from forest or other natural ecosystems. Criteria also include regulations on the reduction of pesticides and herbicides, soil and water protection and other environmental and social criteria. In Mato Grosso, the project group farms 20,342 hectares of soy, while setting aside 15,125 hectares for conservation.

Globally, in the beginning of 2016, 0.71 % of soy production was RTRS certified. National networks such as the Swiss Soy Network are valuable partners in promoting standards and pushing companies to source responsibly. In 2004, WWF and Coop created the "Basel Criteria" for sustainable soy farming and thus lay the groundwork for standards such as RTRS or Proterra. The Swiss Soy Network, which WWF is a member of, was founded in 2011 with the goal of raising the share of responsible non-genetically modified soy imported to Switzerland to at least 90 %. In 2015, the share of responsible soy imports was 94 %.

46 http://www.responsiblesoy.org

5 Textiles and Apparel

In 2014, global textiles and clothing[47] exports accounted for CHF 791 billion, representing 4.3 % of world trade in merchandise and 6.5 % of world trade in manufactured goods (WTO, 2015). According to the World Trade Organization, compound annual growth in apparel and textiles exports averaged 5.5 % worldwide for the decade ending in 2010. Vietnam, China, Bangladesh, Turkey, and India were among the fastest growing nations during this period (WTO, 2012).

Top Countries of Import to Switzerland and their Water Risk

Regarding volume and value, China is the main source of textiles and apparel imported to Switzerland, followed by Germany, Bangladesh, Italy, Turkey, and India[48] (see Table 3)[49].

Sector Water Risk and Water Intensity

Water-related risks are substantial in textiles and apparel production. There are strong links to the agriculture (mainly cotton production) and petrochemical (synthetic fibres, for example polyester) industries, both of which are significant water users and polluters.

Cotton production is the most water-intensive segment of the sector's value chain and is also the segment most vulnerable to climate-induced physical water risks. The impacts of unsustainable cotton production are dramatically demonstrated by the continuing decline of the Aral Sea, 90 % of which has vanished over the past 50 years as a direct result of water used for intensive cotton production (Varis, 2014; EJF, 2012). Large quantities of freshwater are also needed for wet processing of textiles, like dyeing.

The textile industry is second only to agriculture as the world's biggest water polluter. Each year, mills discharge millions of litres of wastewater containing toxic chemicals, such as formaldehyde[50], chlorine, and heavy metals, like lead and mercury. Many of these chemicals cannot be filtered or removed and cause both environmental damage and human disease[51].

47 A note on terminology: "Apparel" includes clothing and footwear while "clothing" does not include footwear.

48 Swiss Impex, accessed on April 2016, tariff head 58 – Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery, tariff head 60 – Knitted or crocheted fabrics, tariff head 61 – Articles of apparel and clothing accessories, knitted or crocheted, tariff head 62 – Articles of apparel and clothing accessories, not knitted or crocheted, tariff head 63 – Other made-up textile articles; sets; worn clothing and worn textile articles; rags, tariff head 64 – Footwear, gaiters and the like; parts of such articles, tariff head 65 – Headgear and parts thereof

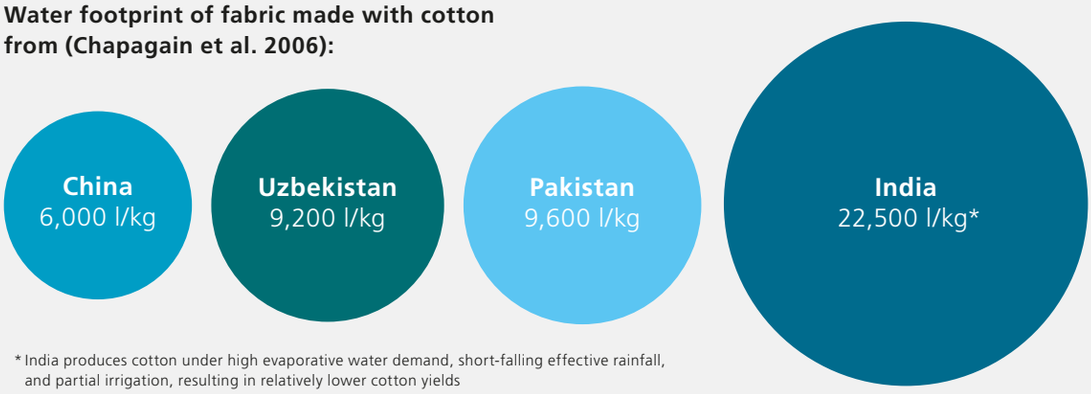
49 For Germany's role in this statistic, see methodological limitations about re-exports. Switzerland is also a re-exporter of textiles and apparel, most notably to Italy and Germany.

50 Formaldehyde resins are used in finishes on fabrics to make them crease and wrinkle free and give them other easy-care properties. Formaldehyde is irritant to the skin, eyes and nervous system.

51 http://www.sustainablecommunication.org/eco360/what-is-eco360s-causes/water-pollution

Some Key Figures

Water footprint of fabric made with cotton from (Chapagain et al. 2006):



* India produces cotton under high evaporative water demand, short-falling effective rainfall, and partial irrigation, resulting in relatively lower cotton yields

The World Bank estimates that 20 % of industrial water pollution comes from textile dyeing and treatment [52].

	Import quantity (kg)	Import value (CHF)	Percentage of Import Quantity	Physical Risk	Regulatory Risk	Reputational Risk
China	55,428,019	1,966,438,308	30 %	●	●	●
Germany	20,884,616	778,376,666	11 %	●	●	●
Bangladesh	15,184,677	341,789,893	8 %	●	●	●
Italy	12,292,999	1,049,105,891	7 %	●	●	●
Turkey	11,948,423	416,946,266	7 %	●	●	●
India	8,768,475	292,178,286	5 %	●	●	●
Vietnam	6,992,423	310,635,370	4 %	●	●	●
France	4,289,901	196,821,491	2 %	●	●	●
Portugal	4,137,671	151,914,858	2 %	●	●	●
Pakistan	4,049,412	67,699,728	2 %	●	●	●

Table 3. *Top ten countries from which Switzerland imports textiles and apparel and their water risk (based on import quantity)*

52 http://www.sustainablecommunication.org/eco360/what-is-eco360s-causes/water-pollution

The impacts of water risk on a textile company's performance can be illustrated by the decreased profits of clothing retailers after having to absorb skyrocketed cotton prices due to flooding in major cotton growing areas in Pakistan, Australia, and China that limited supply in 2011 (Ward, 2011; White, 2011). The drought California experienced in 2015 also forced cotton farmers to reduce their production, which in turn affected local clothing companies (Daniels, 2015).

Regulation is becoming stricter in many countries, such as in China and India, due to growing public awareness and pressure. Thus the regulatory risk for this industry is considerable.

Country Case

Textiles and Apparel from Bangladesh

Share of global production (WTO, 2015)

Textiles	Clothing
>0.8 %	5.1 %

Share of imports to Switzerland[53]

Textiles
8.28 %[54]

In 2014, Bangladesh was the world's third largest exporter of clothing, after China and the EU (WTO, 2015). The ready-made-garment (RMG) sector contributes over 81 % of export earnings and employs 4.2 million people[55] (Akter, 2015). Over the past six years, the textiles and clothing sector has grown by an average of 13.9 % annually (Leahey, 2015).

Water Situation

Bangladesh lies in the world's largest estuary delta made up of the Ganges, Brahmaputra, and Meghna (GBM) rivers. Only 7 % of the GBM system's total catchment lies in Bangladesh. Most rivers in Bangladesh are tributaries or distributaries to the GBM river systems. The water regime of the GBM river systems is marked by a great disparity between the monsoon floods and the low flow during the dry season. Periodic and devastating floods can cover up to 60 % of the country; water scarcity during the dry season is another big challenge[56]. Climate change has altered the frequency and inten-

53 Swiss Impex, accessed on April 2016
54 Combined share textiles and apparel
55 http://www.garmentsmerchandising.com/readymade-garments-industry-of-bangladesh
56 http://chinawaterrisk.org/opinions/sinking-reputations-lessons-from-bangladesh

sity of the monsoons and is causing rapid snowmelt in the Himalayas, the source of two of Bangladesh's three major waterways. This will also entail freshwater shortages in the future, as India and China will increase damming upstream in response to their own water and energy shortages[57].

Bangladesh is faced with groundwater contamination due to naturally occurring arsenic, resulting in unsafe drinking water, and permanent depletion of groundwater levels, particularly in the Dhaka metropolitan area and in the northwest[58, 59]. The water deficit due to an imbalance between water demand and supply in the district of Dhaka is also causing conflict between water users (Akter et al., 2012).

Regulatory Risks

The textiles and clothing industries are contributing heavily to water pollution in Bangladesh particularly in the large industrial areas of the capital, Dhaka (Yardley, 2013). With over 1,700 washing, dyeing, and finishing units consuming 1,500 billion litres of groundwater annually and discharging wastewater, the sector impacts the lives of more than 12 million of Dhaka's inhabitants (World Bank, 2014). Each of the four major rivers near the capital is substantially degraded by untreated industrial discharges. The textile industry's wet processors are one of the biggest culprits as they release used dyes and chemicals directly into the surface waters[60]. In addition to polluting the city's drinking water sources, toxic wastewater inundates rice paddies and is causing fish stocks to die (Yardley, 2013).

Over 87 % of Dhaka's water supply is extracted from groundwater (Khan & Ahmed, 2014). Heavy water usage by the textile and clothing industry is contributing to groundwater over-exploitation. Recent research has shown a worrying water table decline of almost 3 metres per year (World Bank, 2014). Estimates suggest that the textile industry may be consuming almost as much groundwater as the capital's 12 million inhabitants (ibid.). Growing water scarcity and conflicts over water as a consequence pose tangible physical risks to the textiles and apparel industry.

Heavy water usage by the textile and clothing industry is contributing to groundwater overexploitation

Regulatory Risks

While the World Bank found Bangladesh's existing legislative and regulatory environment management framework to be acceptable in 2014, it needs to be complemented by additional regulations to address growing industrial pollution concerns (World Bank 2014). With the textiles and apparel sector representing the backbone of the country's economy, it is proving difficult to balance environmental needs with those of this valuable and politically powerful industry (World Bank, 2014; Yardley, 2013).

After tragic accidents in Bangladeshi textile factories in 2012 and 2013, the European Union threatened sanctions if working conditions for labourers were not improved in Bangladesh (Spiegel & Wilson, 2013). In order to reduce the negative environmental and social impacts that activities of Swiss companies can be associated with, a coalition of Swiss civil society organizations launched the Responsible Business Initiative in 2015.

57 http://chinawaterrisk.org/opinions/sinking-reputations-lessons-from-bangladesh
58 ibid
59 Water Risk Filter: Bangladesh
60 http://citiscope.org/story/2015/textile-plants-are-dhakas-water-problem-and-also-its-solution#sthash.Ovm254og.dpuf

The initiative aims at introducing a binding framework and common benchmarks for Swiss companies to protect the environment and human rights abroad[61]. The initiative was officially submitted to the Federal Chancellery on 10 October 2016[62].

Reputational Risks

Reputational risks for the textiles and apparel industry are substantial. The sector in Bangladesh has been under close public scrutiny since serious regulatory lapses were repeatedly confirmed after multiple incidents killing at least 1,143 workers in RMG factories between 2012 and 2015 (Farhana 2014)[63].

Initiatives such as Greenpeace's Detox Campaign, exposing direct links between global clothing brands, their suppliers and toxic water pollution around the world, have already mobilised global fashion leaders to commit to the elimination of hazardous chemicals from their clothing and are important triggers for a paradigm shift in the textile industry. Further similar initiatives can be expected to be launched by NGOs in the future.

With over 1,700 washing, dyeing, and finishing units consuming 1,500 billion litres of groundwater annually and discharging wastewater, the sector impacts the lives of more than 12 million of Dhaka's inhabitants

61 http://konzern-initiative.ch
62 http://konzern-initiative.ch/echte-schweizer-qualitaet-heisst-schutz-von-mensch-und-umwelt
63 http://www.solidaritycenter.org/wp-content/uploads/2015/12/Bangladesh.Garment-Factory-injury-and-death-fact-sheet12.pdf

Good Practices in the Bangladeshi Ready Made Garments (RMG) Sector

WWF and H&M

Since 2013, WWF and H&M have been partnering in applying WWF's water stewardship approach to H&M's entire supply chain: suppliers, staff, consumers, governments and other stakeholders. The work has involved analysing H&M's water related risks, developing the management for H&M's value chains, as well as working with other stakeholders on the ground in China and Bangladesh (collective action). From 2016, H&M continues to develop the organization's water practices. The partnership will also continue to work with water stewardship, focusing on collective action with other companies, decision makers and civil society at chosen river basins in China[64].

2030 Water Resources Group

The World Bank's 2030 Water Resources Group (2030 WRG)[65] supports several public-private and civil society approaches in Bangladesh that aim to tackle existing industrial water management issues:

- The Bangladesh Water Multi-Stakeholder Partnership, composed of high-level government, private sector, civil society, NGO and academia representatives, aims to catalyse projects to reduce the demand-supply gap and improve the quality of water resources for agricultural, industrial, and domestic use[66].
- The Economic Incentives for Sustainable Water Management initiative aims to assess the effectiveness of current incentives for industrial water use and wastewater treatment, with the aim of improving efficiency in industrial water use and compliance with wastewater treatment standards by comparing current incentives with international benchmarks and recommending appropriate upgrades to the current incentives schemes.
- Through the proposed Textile Environment Alliance (TEA) initiative, 2030 WRG aims to facilitate the propagation of H&M's (considered leading edge among the international textile brands in Bangladesh) good water management practices across the sector. The TEA, once established, is expected to set higher standards for textile water efficiency and wastewater treatment, save 20 % of water used by 2021 and support sector growth[67].
- Through the Common Effluent Treatment Plan (CETP) Core Group, 2030 WRG will help build capacity of the Bangladesh Economic Zones Authority (BEZA) on industrial wastewater treatment and re-use. The CETP Core Group will also act as a knowledge exchange hub for policy makers, zone developers, technology providers, CETP operators and financiers / investors. The ultimate goal of the CETP Core Group is to ensure that in all of Bangladesh's Economic Zones CETPs are set up in a timely manner at the right standards, and operate in a sustainable way.

64 http://wwf.panda.org/what_we_do/how_we_work/businesses/business_partnerships/handm.cfm
65 www.2030wrg.org
66 https://www.2030wrg.org/wp-content/uploads/2016/02/WRG-Brochure_2015_8-x-8_Sprds_0222.pdf
67 http://programme.worldwaterweek.org/sites/default/files/2_anders_berntell_-_keynote_address_-_stockholm_water_and_jobs_seminar_-_aug_28_2016_-_draft_00000002.pdf

6 Pulp and Paper

The pulp and paper industry accounts for more than 40 % of industrial wood traded globally[68]. Over 90 % of globally produced paper applies "Elemental Chlorine Free" (ECF) technology which involves a pulp bleaching process using the hazardous compound chlorine dioxide[69].

The industry is the single largest industrial water consumer in developed countries[70], requiring on average 54 m^3 of water per metric tonne of finished product[71]. Water is used in nearly every step of the industrial pulp and paper production process, resulting in large volumes of wastewater and residual sludge. Often situated near rivers, lakes or coastlines, paper mills may discharge many pollutants into these surrounding water bodies with negative impacts to the aquatic ecosystems and health of the people that live near the mill. As demand for paper-based products continues to grow, closer scrutiny needs to be applied to the environmental impacts of the chemicals used in their production, in particular the bleaching of wood pulp.

Physical Risks[72]

The pulp and paper industry is exposed to quantitative and qualitative physical risk in their operations. The operation requires constant and reliable access to vast amounts of water of certain quality, as higher water pollution levels would incur costs for water treatment. Most of the required water is not consumed within the production process but is discharged loaded with pollutants (including temperature) causing negative impacts on environment if not treated properly prior to its release into the recipient water body.

Water is used in nearly every step of the industrial pulp and paper production process, resulting in large volumes of wastewater and residual sludge

If hazardous chlorinated compounds or other by-products of the ECF process are discharged into waterways, they can pollute the water and degrade the environment. As these compounds are bio-accumulative, they enter the food chain and can cause adverse health effects[73]. Since chlorine compounds are highly corrosive, it is challenging for ECF mills to create closed loop pulping systems that recycle wastewater from the bleaching process[74]. Employing processes such as TCF (totally chlorine free) bleaching, which uses no chlorine-containing compounds, is one way to address the issue of reducing fresh water demand by enabling wastewater recycling[75].

68 http://www.worldwildlife.org/industries/pulp-and-paper
69 ibid.
70 ibid.
71 www.waterworld.com/articles/iww/print/volume-12/issue-3/feature-editorial/water-treatment-in-the-pulp-and-paper-industry.html
72 The italicized text in Physical, Regulatory, and Reputational risks originates from ACE & WWF, 2015
73 www.ejnet.org/dioxin/
74 http://www.energy.ca.gov/process/pubs/LP_CLOSED_CYCLE_FINAL.PDF
75 ibid.

Thousands of Black Neck Swans wiped out in the Carols Anwandter Nature Sanctuary following major contamination by Celco-Arauco in 2005

Regulatory Risks

Due to potentially large impact on water quantity and water quality, the pulp and paper industry is controlled by many laws and regulations, which can differ substantially between different countries. More importantly the effect of these laws and regulations depends on the level of their implementation and enforcement. Changes in water licences, water pricing and allowed pollution levels in the effluent have a particularly high impact on the cost of operation. Constant improvement of water efficiency and treatment efforts has to take place to respond to the regulatory framework.

Reputational Risks

If a company performs insufficiently or attracts a wider negative media attention, this can challenge the acceptance of the company and its products by basin stakeholders. The licence to operate might be challenged, even beyond the facility, at the company and sectoral level. Disclosure of, and gaining knowledge about, its own operational and sectoral environmental impacts are seen as the main pathways for showing willingness of the company to improve and to show success and lessons learned.

A number of influential NGOs (such as Greenpeace and Amnesty International) are running Detox campaigns related to industrial water (see reputational risk under Textiles and Apparel). Companies are facing increasing scrutiny over the hazardous nature of their factory discharges and are being urged to go beyond standard compliance requirements. Demands to clean up 'dirty' operations are unlikely to diminish given this push for hazardous chemicals elimination.

7 Financial Services

Financial service providers consider water risk to be the next emerging challenge, beyond climate change related risks, and are starting to pay attention to their clients' exposure to water risks. Seasonal droughts and floods, bad water quality, and changes in water-related regulations are risks faced by financial institutions through their investment, financing, or insurance portfolios. Depending on the investment, simply shifting to other opportunities might not be an option. Also, the exposure towards water risks highly depends on the specific business model of the actors in the financial sector. Thus, the relationship between the financial services sector and its investments requires new ways of risk mitigation.

The financial sector generates a substantial proportion of Swiss economic output. In 2014, the financial sector generated around CHF 61 billion or 10 % of the Swiss GDP. At the same time, the sector provided around 6 % of all employment in Switzerland (BAKBASEL 2015). Furthermore, the financial services sector is a key "enabler" as many "real economy sectors" are linked and influenced by them.

Financial institutions as key enablers of economic development can also be important promoters of sustainable development

Water Risks of the Financial Sector

Water risk for the financial sector is mostly indirect since it is not linked with direct operations and a bank does not own its investment portfolio. All economic sectors are linked to, and influenced by, financial services to some degree. Therefore, water-related risks of any given sector become embedded in any investment and financing portfolio.

Water-related risks impact financial institutions variously. They can increase the probability of not being able to meet payment obligations, damage the value of investments and assets, or devalue new business opportunities[76]. The impacts of water risk on their own reputation is another driver for financial institutions to better understand the issue[77]. Generally, water is a more material risk than others, such as climate change, as they have more direct impact. Furthermore, water risks are becoming harder to predict because of - for example - growing water demand or the unpredictable interactions and interdependencies with climate change risks.

Depending on the business model, the actors in the financial sector need to develop their own understanding of where water risks are materially relevant for their portfolio and/or performance and how to best integrate them into decision making processes.

Assessing Risks

In recent years, the financial services sector has become increasingly aware of water-related risks and the need to establish adequate mitigation strategies. Water risks require cross-sectoral thinking; however, the financial industry is usually organised in a sector-specific structure. To properly understand water risks, detailed regional and even

76 Findings / Assessments based on WWF-Finance sector experts
77 Findings / Assessments based on expert interviews with Swiss banks and asset managers

basin-related information relevant to the specific company is required. Information on water risks is becoming more accessible for mainstream analysts. For instance a Water Risk Valuation Tool[78] released by Bloomberg LP enables analysts to incorporate water risks into company valuations for copper and gold mining companies.

Physical risks	**Basin**	Most financial institutions and insurance companies still seem to ignore the importance of knowing the freshwater context that their clients or suppliers are operating in. • Freshwater availability (quantity) may be under pressure due to increasing demand from other basin users, and other basin users may be polluting freshwater sources (quality).
	Company	Underestimation of water-related risks for assets, debtors, commodity suppliers and clients, resulting in financial risk. • Due to lack of understating of water-related risks. • Due to lack of information or water-related risk evaluation methodologies. • Water-related risks are different for each of the clients and suppliers, due to different industries and basin contexts.
Regulatory risks	**Basin**	No or limited regulation or no or limited enforcement by local government can impact water quantity and quality in basin and therefore increase financial risks. • E.g. If governments sold more water than available, if there is a large difference in regulation and enforcement in different countries in the same basin, or if enforcement is insufficient.
	Company	Stricter regulation and increased enforcement by government may increase costs for freshwater and wastewater treatment and discharge and therefore the bottom line performance of assets, debtors, and commodity suppliers. • Regulation to force companies to use innovative production technologies to reduce impact on water. • Potential price increase or changes in pricing structures. Regulators may force insurance companies to cover more water risks. • This can result in higher uncertainties and potential claims, which in turn may impact prices and even presence in certain countries.
Reputational risks	**Basin**	Assets, debtors, or commodity suppliers in high water risk geographies (basins) may negatively impact reputation. • This can be the case even though the specific investment is highly efficient and not polluting water.
	Company	Assets, debtors, or commodity suppliers in high water risk industries may negatively impact reputation. • In general, the public and insurance company clients are becoming increasingly sensitive to impacts on local environments and populations. Risk that claims are partially covered by insurance companies, while general public is expecting full coverage, • Ensure clients understand their water-related insurance policies.

Table 4. *A general overview of water-related risks for the financial services sector*

78 https://www.bloomberg.com/bcause/new-tool-integrates-water-risk-considerations-in-equity-valuation-process

Best Practices

Financial institutions as key enablers of economic development can also be important promoters of sustainable development. They can make a positive difference by taking into account aspects like sustainable water management, efficient water use, alternative approaches to water supply, water pollution minimisation, and water resource recycling. In the past few years, the number of environmental and social policy resolutions filed by investors has strongly increased, especially in the USA (CDP, 2013).

Initiatives like the Equator Principles[79] and the UN Principles for Responsible Investment[80] have contributed to raising awareness and prioritising water risks. Another initiative is the CDP Water Program[81], which has contributed to more transparency related to companies' water-risk. It was recently announced that a group of global banks, including UBS Switzerland, are working with the Natural Capital Declaration and the German Government's Emerging Markets Dialogue on Green Finance to include the economic impact of drought in bank stress testing scenarios. The Natural Capital Declaration[82] has been working on a tool for corporate bond credit analysis on integrating water stress factors into credit assessments of bond issuers in the beverages, mining, and power utilities sectors.

Some development banks have made good strides in reducing the water risk in their portfolios by providing technical assistance to their clients (UNEP FI & UNEP GPA, 2006). It is becoming increasingly more commonplace for public and private decision-makers to develop and implement mitigation strategies and new technologies to address future challenges, increasing water demand, and climate change impacts (World Economic Forum, 2016).

79 http://www.equator-principles.com
80 https://www.unpri.org
81 https://www.cdp.net/en/water
82 http://www.naturalcapitaldeclaration.org


Credit Suisse

8 Water Stewardship – From Risk to Opportunity

Water is the ultimate shared resource – and everyone's responsibility

Water risks vary from country to country and from sector to sector. Certain risks, typically those related directly to production, such as water consumption or pollution, can be relatively easily addressed by producing companies themselves. However, depending on a company's operation and supply chain, the company may only be affected indirectly by these risks. A retailer shares the risk of its entire supply chain, be it coffee from Vietnam, oranges from South Africa, or t-shirts made in China.

Many risks only emerge because various stakeholders use the same water source. Thus, the root cause of water risk is often not the availability or use of water, but governance, and unless an entire river basin, or aquifer, is managed in a sustainable way, one company's improved efficiency will likely be overshadowed by increased use from a competitor or a neighbouring community. This makes water the ultimate shared resource – and everyone's responsibility (WWF, 2013).

For these reasons, shared water risks cannot be addressed by one stakeholder alone. Collective action is needed at the local and basin level. This typically involves some degree of cooperation with other stakeholders and governments, a sometime difficult process (Lloyd's, 2010). Water stewardship can help to facilitate this process and to implement collective actions at both the local and basin level.

Water Stewardship

Water stewardship goes beyond being an efficient water user. It means contributing to the responsible and sustainable management of freshwater resources and finding solutions for shared risks in a specific river basin, or aquifer. There is an essential business case for achieving sustainable flows – access to clean water to sustain production and profitability. Companies and investors that evolve from understanding their portfolio's water risks towards implementing water risk management strategies decrease their risk exposure. Becoming a good water steward requires shifting from specific and philanthropic initiatives to recognising water as a strategic and core business issue that is material to profits and long-term opportunities for growth.

There are different initiatives working on water stewardship. However, there is no single agreed definition of the term water stewardship. Also, there are different related concepts and roadmaps for its implementation[83]. Nonetheless, most concepts are based on similar thinking and are not contradictory. The following steps (Figure 5) help define WWF's concept of water stewardship. The steps were designed to better understand the various water-related activities that companies can engage in, not as a prescription for every company. While they are simple in definition, there is a lot of depth and detail to each step. There is also overlap between steps, meaning that they should be seen

83 see e.g. Water Footprint Network, Global Compact's CEO Water Mandate or Pacific Institute.

as fluid and continual. The local nature of water will dictate where companies have to prioritise, as will the level of risk as dictated by the business sector and geography (WWF, 2013).

The first three steps in Figure 5 are materially distinct from the next two. Water awareness, knowledge of impacts and internal action are under direct control of a company. They concern internal impacts on water resources, efficiency of water use, and private goods. On the other hand, steps four and five – collective action and influence of governance – are outside the direct sphere of influence and concern impact of others on the company, allocation of resources and public goods. This is where a company shifts from management to stewardship – where the rules, measures, focus, engagement, control and complexity change considerably – and where traditional notions of business sustainability are most challenged by the resource.

Definition of Water Stewardship

The Alliance for Water Stewardship defines water stewardship as: "The use of water that is socially equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that involves site and catchment-based actions. Good water stewards understand their own water use, catchment context and shared risk in terms of water governance, water balance, water quality and important water-related areas; and then engage in meaningful individual and collective actions that benefit people and nature." [84]

Annotations:

- Socially equitable water use recognises and implements the human rights to water and sanitation and helps to ensure human wellbeing and equity.
- Environmentally sustainable water use maintains or improves biodiversity, ecological, and hydrological processes at the catchment level.
- Economically beneficial water use contributes to long-term sustainable economic growth and development and poverty alleviation for water users, local communities, and society at large.
- Internal actions: within the site and under the responsibility of the site management.
- External actions: in collaboration with others in the catchment and including actions in the supply chain and the catchment as a whole.
- Water stewardship is intended to support and contribute to Integrated Water Resource Management by all actors.

84 http://www.allianceforwaterstewardship.org/about-aws.html#what-is-water-stewardship

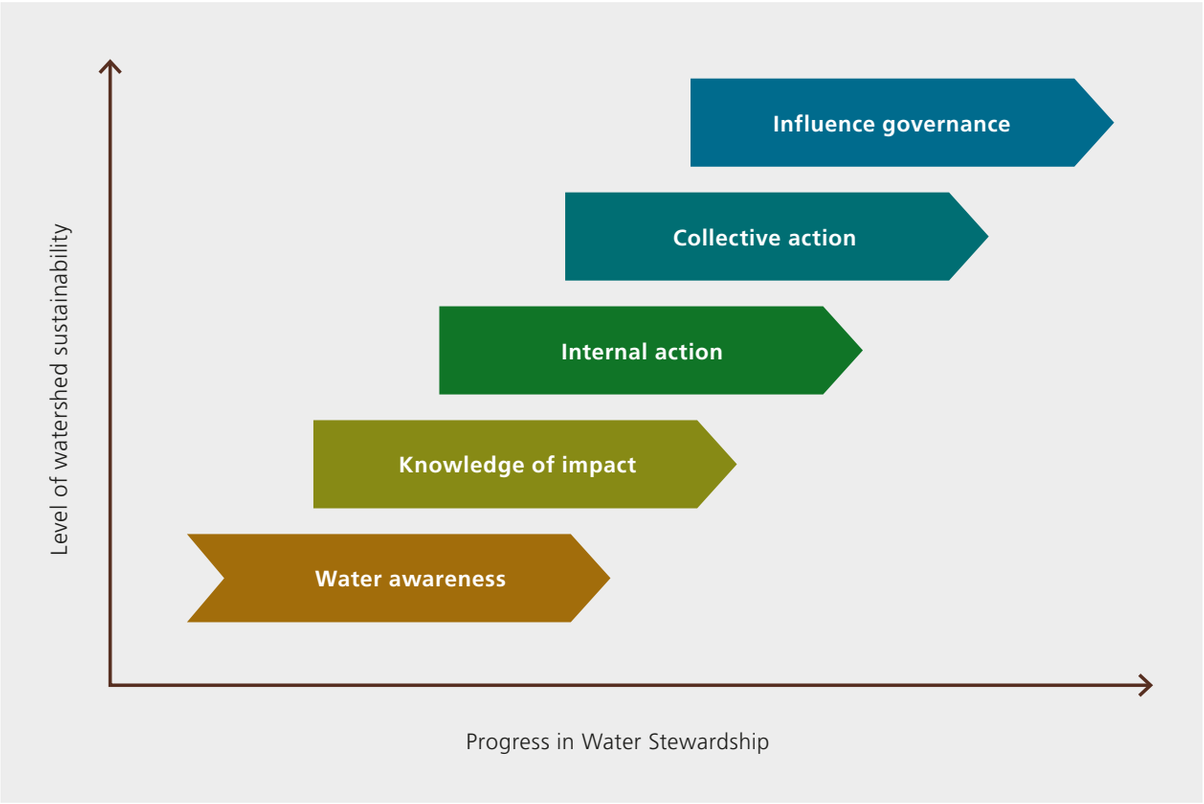


Figure 5. *The five steps of WWF's concept of water stewardship*

Water awareness

- High-level understanding of global water challenges, the company's dependence on freshwater, and its exposure to water-related risks.
- Internal commitment from the CEO to plant managers, suppliers, and employees.
- Understanding of how the company is perceived by others, including basin stakeholders, the press, and consumers.

Knowledge of impact

- Understanding the company's water footprint: direct (company operations) and indirect (supply chain) water dependencies.
- Analysing water risks (e.g. with WWF Water Risk Filter) and estimating impact on water resources. Risks should cover physical (e.g. quantity, quality), regulatory (e.g. legislation, enforcement) and reputational (e.g. media attention, community conflicts).

Internal action

- Putting a strategy in place with goals and measures: launching water efficiency projects; engaging with employees, consumers and marketing to address opportunities and risks; improving water quantity and quality reporting; preventing pollution.
- Engaging suppliers and assessing options such as alternative sourcing, product innovation, or improved management of water in raw materials production.

Collective action

- Engaging with stakeholders at various levels. This can include participation in global to local public forums to address water management issues; support for freshwater conservation projects; partnerships to pool technical, human, and financial resources to conserve freshwater resources; participation in local water management groups.

Influence governance

- Advocacy, influencing or lobbying, partnerships, financial support, facilitation or institutional strengthening at the local, watershed, state or national level.

9 How to deal with Water Risk?

We believe that now is a perfect moment for all stakeholders to anticipate the trends and search for long-term, smart water strategies that ultimately benefit the entire planet.

Water risk situations around the globe will worsen in the future. Rising populations, changing consumption patterns, and climate change will directly affect water availability and quality. Water stewardship allows stakeholders to address risks that they have formerly not been able to tackle. Still, the concept is fairly new and there is a lot of room for development.

Since its inception, we have seen water stewardship approaches succeed and fail. We are convinced that the challenges ahead can only be faced if all parties are engaged in the dialogue, adopt working strategies, develop new approaches, and act together.

Opportunities for Companies

Ultimately, companies are heavily affected by water-related risks. It is also in their power to mitigate these risks in their direct operations or to define standards within their supply chains. Many companies already recognise the value of water as a strategic resource for success. Accordingly, they have begun developing and implementing strategies for its responsible and sustainable use, such as:

- **Identifying risks, impacts, and responsibilities** related to water. Water risks affecting Swiss companies are primarily external. Therefore, the first step towards risk mitigation is understanding the entire supply chain and the tangible risks.

- **Developing and implementing company-specific water stewardship strategies** by uniting with scientists, NGOs, government agencies, and other stakeholders. Companies can also help reduce water risks by investing in long term supply relationships. This will provide their supply partners with the means to engage in sustainable production and to invest in the latest technologies or obtain certification.

- **Engaging in collective action** for sustainable water management by direct communication with local food and textile producers as well as retailers. Companies can combine efforts and good practices with those of allies who share their values and vision and involve them in internal processes. Furthermore, they can engage in platforms and initiatives such as WRG 2030, CEO Water Mandate, AWS Global Water Stewardship Forum[85] and many more to strengthen collective action.

85 https://www.2030wrg.org/; http://ceowatermandate.org/; http://allianceforwaterstewardship.org

- **Applying available sector-specific solutions.** Some industries have already developed sector-specific guidelines on water stewardship, like the International Council on Mining & Metal's Water Stewardship Framework (ICMM, 2014). For the agriculture sector, solutions should be both site and commodity specific. There are already a number of standards that provide guidance for certain commodity/site combinations (WWF-Germany, 2015)[86]. For industries without an agreed global Water Stewardship framework, there are numerous examples of good practices, such as the Sweden Textile Water Initiative[87] provide responsible water use guidelines.

- **Developing new sector-specific solutions** (e.g. guidelines, tools) where none exist and continuing to developing existing standards. Companies can take into account standards that provide specific guidance on water stewardship, such as Alliance for Water Stewardship AWS[88].

- **Increasing transparency and disclosing their actions** through organisations such as CDP[89]. Sharing knowledge about local water problems with other stakeholders, such as indigenous communities, NGOs, and governments can help safeguard water resources.

- **Ensuring compliance with legislation, including by suppliers.** Companies can advocate for strong governance and consistent, predictable legislation.

Response Options for Investors and Financial Institutions

Investors and other financial institutions can assess, manage, and mitigate water-related risks for individual transactions, clients, or investments as well as across their overall portfolio. As the financial services sector is very diverse, adequate responses to dealing with water risk analysis and mitigation are still to be developed in many branches. Such strategies include: assessing their own water risk exposure; embedding water risk in the risk assessment processes; defining appropriate risk integration measures as a cornerstone of the decision-making process; and engaging with their clients. Pushing portfolio companies or clients to mitigate water-related risks and associated impacts is of great importance for ensuring the financial performance of those investment portfolios, loan books, and other forms of related financial service. Tangible actions for investors and financial institutions to become model water stewards include:

- **Developing standards and policies for water risk analysis and impacts** in their internal decision-making processes.

- **Systematically assessing investments, clients, transactions, and portfolios** for water-related risks.

86 see also https://ceowatermandate.org/toolbox/discover-next-steps/sector-specific/ for other sector-specific water stewardship tools
87 http://stwi.se
88 http://www.allianceforwaterstewardship.org
89 https://www.cdp.net

- **Developing and agreeing on standardised water risk disclosures at different levels** (company / asset, financial product, portfolio).

- **Disclosing water risk exposure** and openly demonstrating water risk mitigation actions.
- **Engaging with company management boards** to ensure water risk management policies are in place.

- **Including water-related risks in decision-making processes,** such as environmental and social risk frameworks for underwriting or credit business or the investment processes in asset management.

- **Developing sector-specific sustainable water risk reduction strategies** to address and provide technical assistance for risky clients and/or investments. Aiming towards mitigating risks alongside local strategic stakeholders.

- **Adhering to initiatives** such as the Equator Principles[90], UNEP Financial Initiative's[91] water stewardship scheme, or CDP water programme and developing industry-specific codes of practice.

- **Restricting clients** that do not appropriately address and manage water-related risks regardless of active and regular attempts to engage with them on their portfolios.

- **Actively supporting companies** that are seeking to reduce water-related risks (i. e. reward water stewardship in the market place).

Public Sector Responses

Many of the following responses may also be relevant within Switzerland, but here the focus is on regions from where Switzerland imports goods. A governmental strategy aiming at reducing water risks and taking into account the concept of water stewardship could include the following points:

- **Increasing awareness across different sections of society and establishing a comprehensive understanding of the international water-related risks** an economy and society is exposed to.

- **Developing water stewardship targets and sustainable water criteria** for sourcing in countries with high water-related risks, to ensure the responsible and efficient use of natural resources for production and consumption of goods and services.

90 http://www.equator-principles.com
91 http://www.unepfi.org

- **Ensuring the inclusion of all relevant stakeholders** of the economy, civil society (including indigenous people), and NGOs in the implementation of basin management plans, and **collaborating with key businesses** on shared risk and collective action for water basins.

- **Delivering on the international commitment to the 2030 Agenda for Sustainable Development (SDG),** including those linked to water risk mitigation[92]:
  - Ensure availability and sustainable management of water (Goal 6)
  - Ensure sustainable consumption and production patterns (Goal 12)
  - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (Goal 15)

Consumer Choices

Globalisation has made it increasingly difficult for consumers to know whether their purchases are environmentally sustainable. However, consumers have the power to bring about change by pushing companies to work with socially and environmentally responsible suppliers, to invest in sustainable solutions, and to take water resources seriously. Consumers can impact companies' attitudes towards water risk by:

- **Buying higher quality products** that last longer and buying less, which ultimately has the highest impact on protecting water.

- **Buying goods produced in an environmentally friendly manner** (e.g. certified products like organic for food or FSC for forestry and paper products) and choosing **seasonal and locally-produced fruits and vegetables** that do not involve additional irrigation.

- **Consuming a diet higher in plant-based proteins** (e.g. legumes, nuts, beans and certified soy instead of meat, sausages, dairy and eggs).

- **Informing themselves about the origin of products** and their associated water issues and **demanding transparency** from companies through various channels (including at point-of-sale).

- **Demanding companies only source sustainable goods** rather than forcing consumers to choose what is sustainable.

92 https://sustainabledevelopment.un.org/sdgs

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