

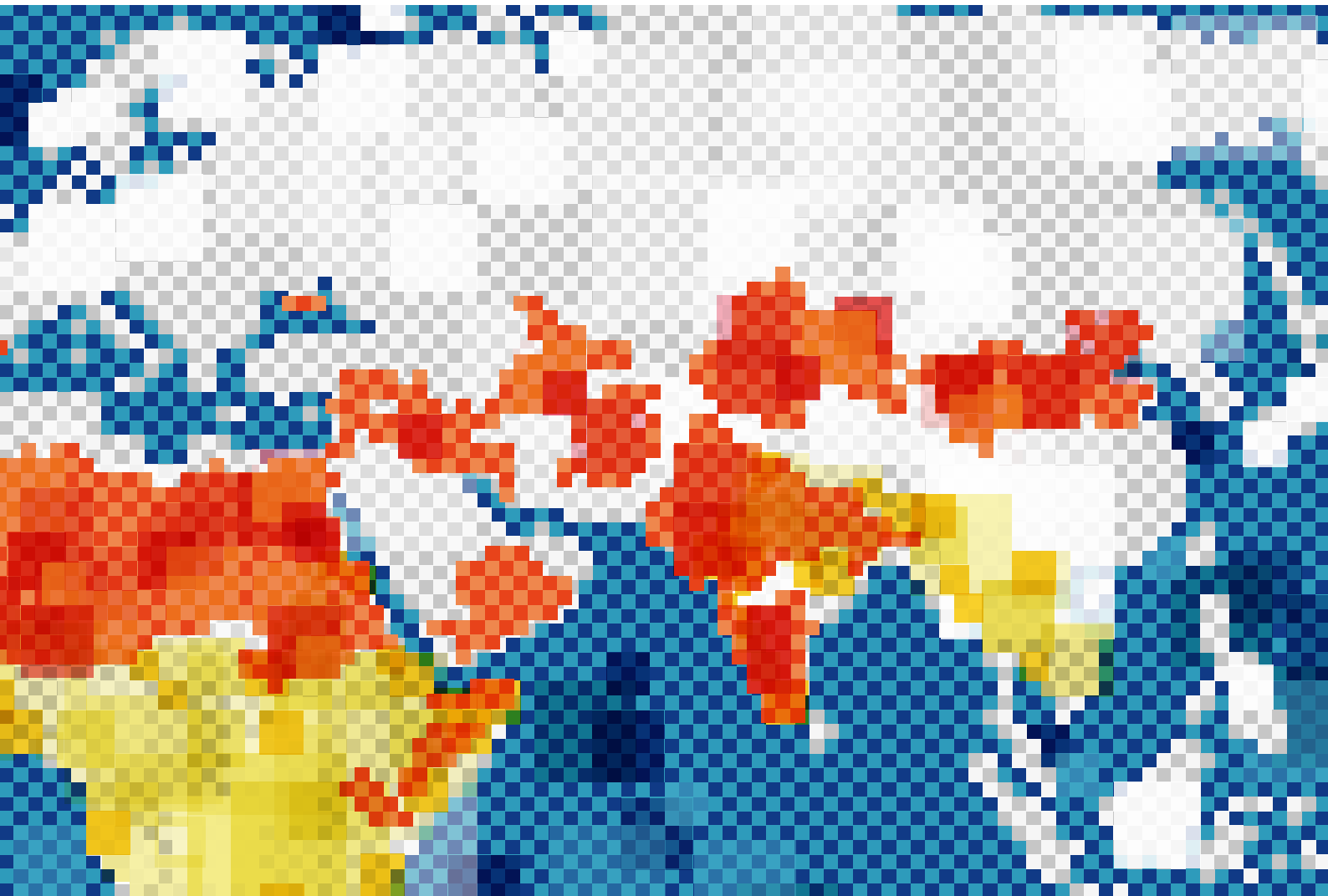


Schweizerische Eidgenossenschaft  
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**Swiss Agency for Development  
and Cooperation SDC**

# **Water as an Asset for Peace**

## Atlas of Risks and Opportunities





Published in cooperation with Zoï Environment Network, Châtelaine, Geneva

# FOREWORD

We hope that every person on this planet, regardless of where she or he lives, will examine his conscience about sustainable access to water and sanitation. The Agenda 2030 for Sustainable Development is founded on the principle that the world shall ensure availability and sustainable management of water and sanitation for all by 2030. This principle is furthermore reinforced by the 2010 United Nations Resolution on the Human Rights to Water and Sanitation. These rights for a sustainable access for all are diminished when the rights of one person are threatened.

Today, Switzerland is committed throughout the world to promote a successful implementation of the "water" Agenda 2030 for all. This is not only a technical, legal or normative issue alone. This is not even a political or diplomatic one. We are confronted with a moral issue that is as old as humanity.

Switzerland wants to promote a water secure world, in which the populations have the capacity to safeguard sustainable access to adequate quantities and quality of water for sustaining livelihoods, human well-being, socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.

Unfortunately, in many places of the world, **tensions and conflicts over access to water** are becoming more frequent. Water scarcity is growing rapidly and posing a threat to the economic, social and political gains of development. Future water scarcity will be much more permanent than past shortages, and the techniques governments have used in responding to past disturbances may no longer be appropriate. In these places, water is the real wild card for political and social unrest, dominating public debate and government thinking and becoming the true political, social and environmental game-changer. It often adds to the fragility of countries.

But there is another underlying reality: in many places of the world, water "connects" people; it is a genuine factor of stability, cooperation and peace.

The entire water community has to deal, to play with this realm: water as a source of tension and a source of cooperation. And to paraphrase an old saying of 1963 by John Fitzgerald Kennedy, we consider water as a daily, a weekly, a monthly process, gradually changing opinions, slowly eroding barriers, quietly building new structures. And however undramatic the pursuit of **sustainable water**, that pursuit must go on.<sup>1</sup>

Peace is a daily, a weekly, a monthly process, gradually changing opinions, slowly eroding old barriers, quietly building new structures. And however undramatic the pursuit of peace, that pursuit must go on.

In Switzerland's vision, the case for water cooperation is strong. While it does require political compromise, it also provides enormous gains for all sides. Water cooperation ensures economic prosperity, fosters resilience, creates trust, and enhances stability. We consider the interlinkages between water, development, peace and security to be essential for the well-being of humankind.

Switzerland might not have the strongest muscles, but its dedication and determination might just be enough to inspire others to join in and reach out to a promising future for water cooperation.

The Atlas of Risks and Opportunities at hand provides an overview of the Swiss Agency for Development and Cooperation's (SDC) activities in the complex sphere of water, conflict and peace. The Atlas introduces the reader into the world of water conflicts from global risks to local impacts, underlined by various maps and infographics, and it highlights opportunities for Switzerland and concrete solutions and products consisting of interventions supported by the Global Programme Water, the South Cooperation, the Cooperation with Eastern Europe and the Swiss Humanitarian Aid. It provides a global overview and a series of continental and regional maps of SDC's water and peace portfolio, and highlights the complexities at various geographical scales. Furthermore, it informs the reader about the support SDC is providing to activities in the areas of diplomacy, policy, economy, finance and technology contributing to the solution of the world's problems related to water, conflicts and cooperation.

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Johan Gély

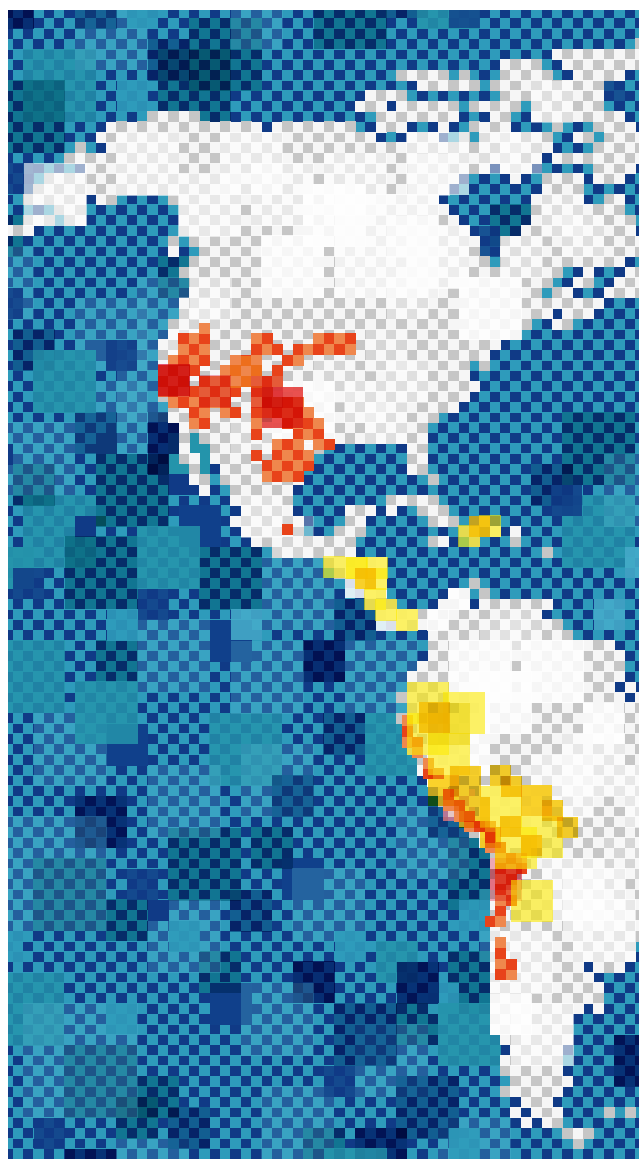


Head Global Programme Water Division  
Swiss Agency for Development and Cooperation (SDC)

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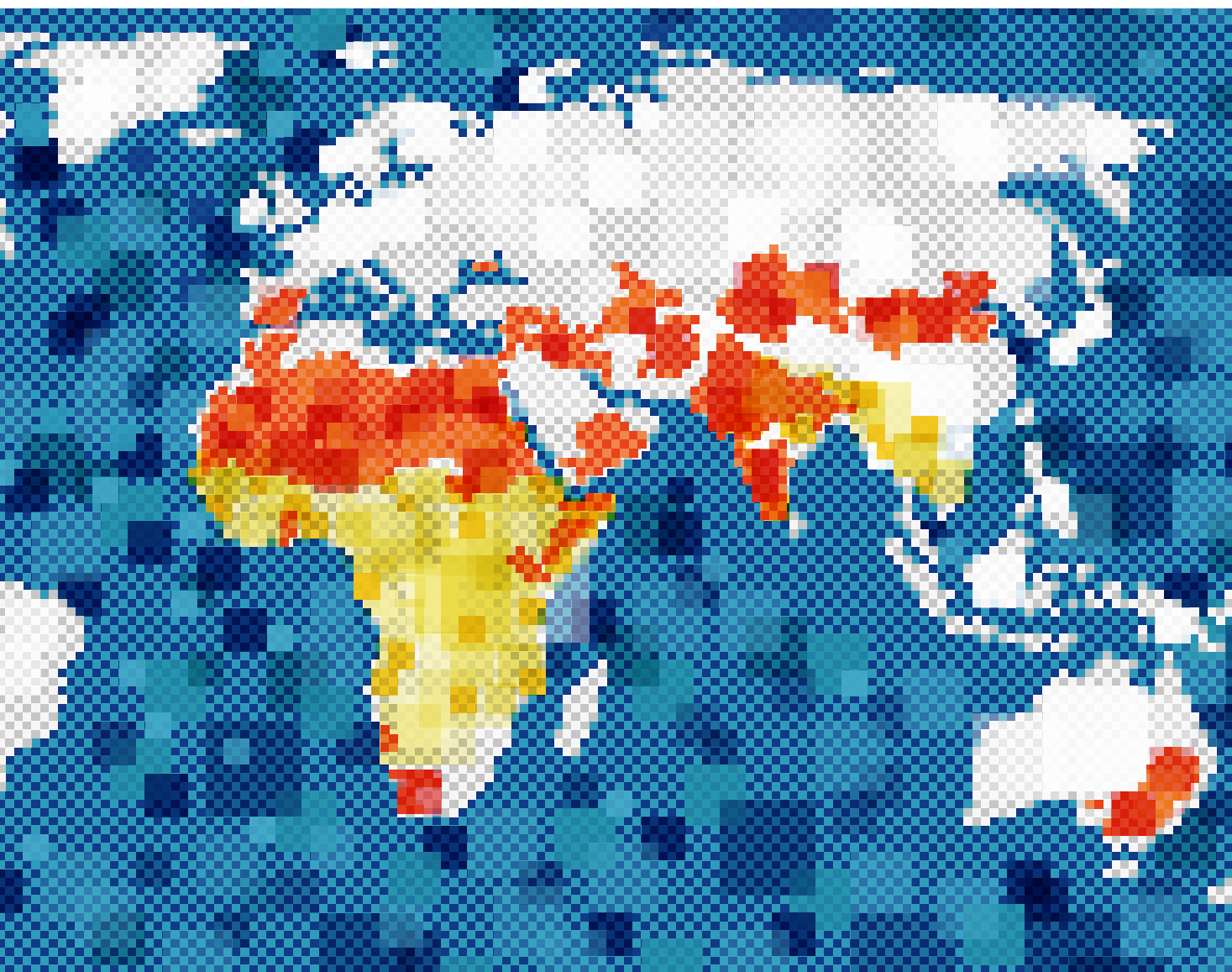
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# PART I GLOBAL RISKS – LOCAL IMPACTS

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Over the past decade, discussions about water have not only featured more prominently in the media and political circles; water has also increasingly become associated with words like stress, crisis, conflict and even war. Grim predictions about looming conflicts, extreme drought and the catastrophic impacts of climate change paint a bleak picture of the future for many regions. But while there is indeed evidence that water can increase tensions and even contribute to conflicts between states and communities, the full story is more nuanced. Water stress alone is a weak predictor of tensions, and can even help cement cooperation when opposing parties have a shared need for water. The structure of conflicts is also changing, with a shift in focus from relatively linear conflicts between states to a more complex picture of intrastate conflicts involving multiple, often non-state, actors. Such conflicts can involve competition between sectors – in which the agricultural, industrial and municipal sectors all vie for the same water resource – or within sectors – in which herders and farmers struggle for control over a single water source. More multi-faceted conflicts pitting local communities against supranational corporations are also becoming increasingly common as globalized production threatens the environmental rights and livelihoods of local communities.<sup>2</sup>



As in previous years, the World Economic Forum's Global Risks Report 2017<sup>6</sup> places water crises – defined as “significant decline[s] in the available quality and quantity of fresh water resulting in harmful effects on human health and/or economic activity” – at the top of the list of long-term global threats (Figure 1). Concretely, such crises can increase local or regional tensions, impact

A world map illustrating the global distribution of fragile countries, physical water risk, and economic water scarcity. The map uses a grayscale background with a grid of latitude and longitude lines. Countries are labeled with their names. A legend in the bottom left corner defines the symbols used:

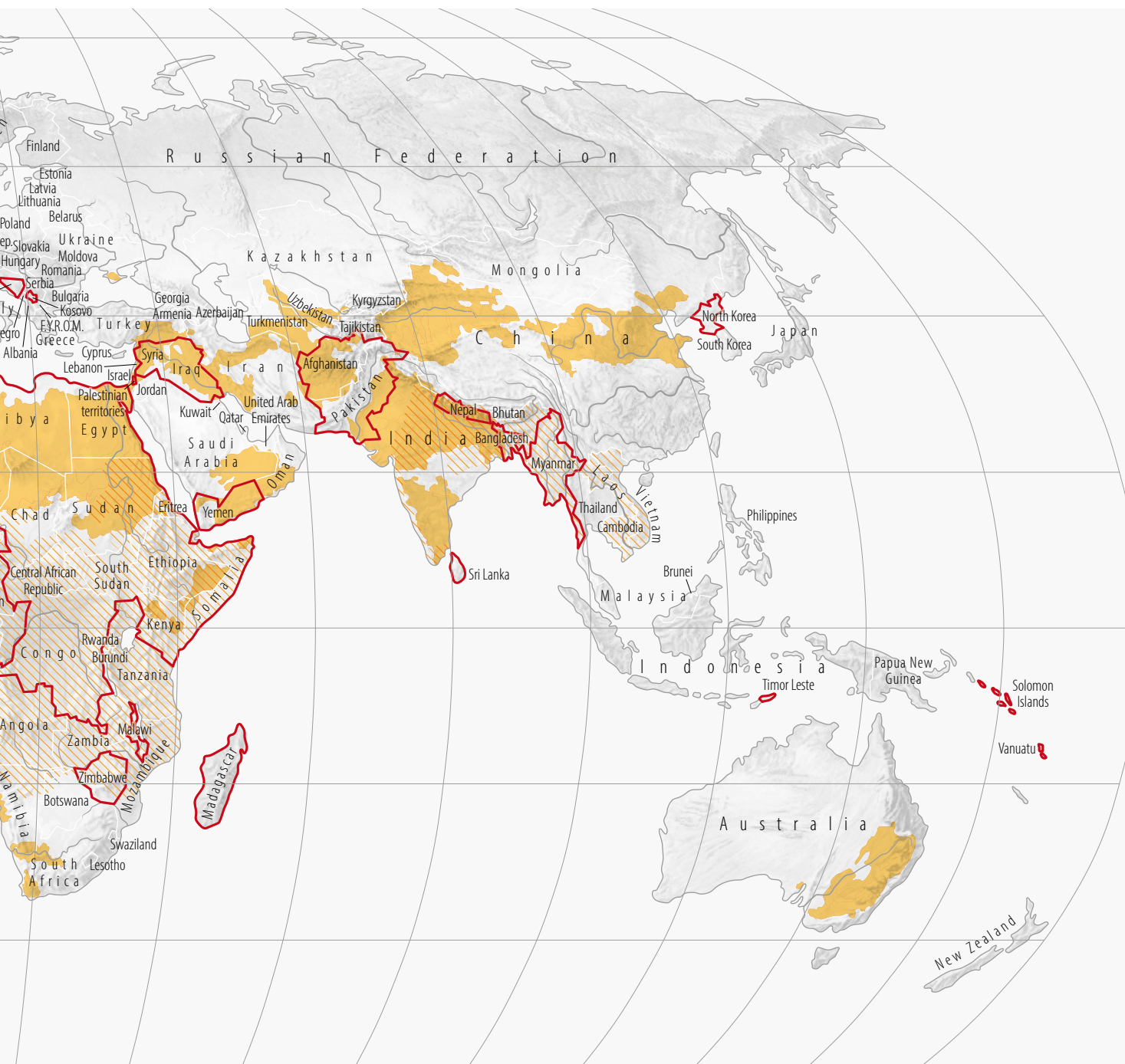
- Fragile countries
- Physical water risk
- Economic water scarcity

The map shows that fragile countries (red outline) are concentrated in sub-Saharan Africa, the Sahel region, and parts of Latin America and the Caribbean. Physical water risk (orange) is prevalent in North Africa, the Middle East, and parts of Central Asia. Economic water scarcity (hatched) is found in various regions, including parts of North Africa, the Middle East, and South America.

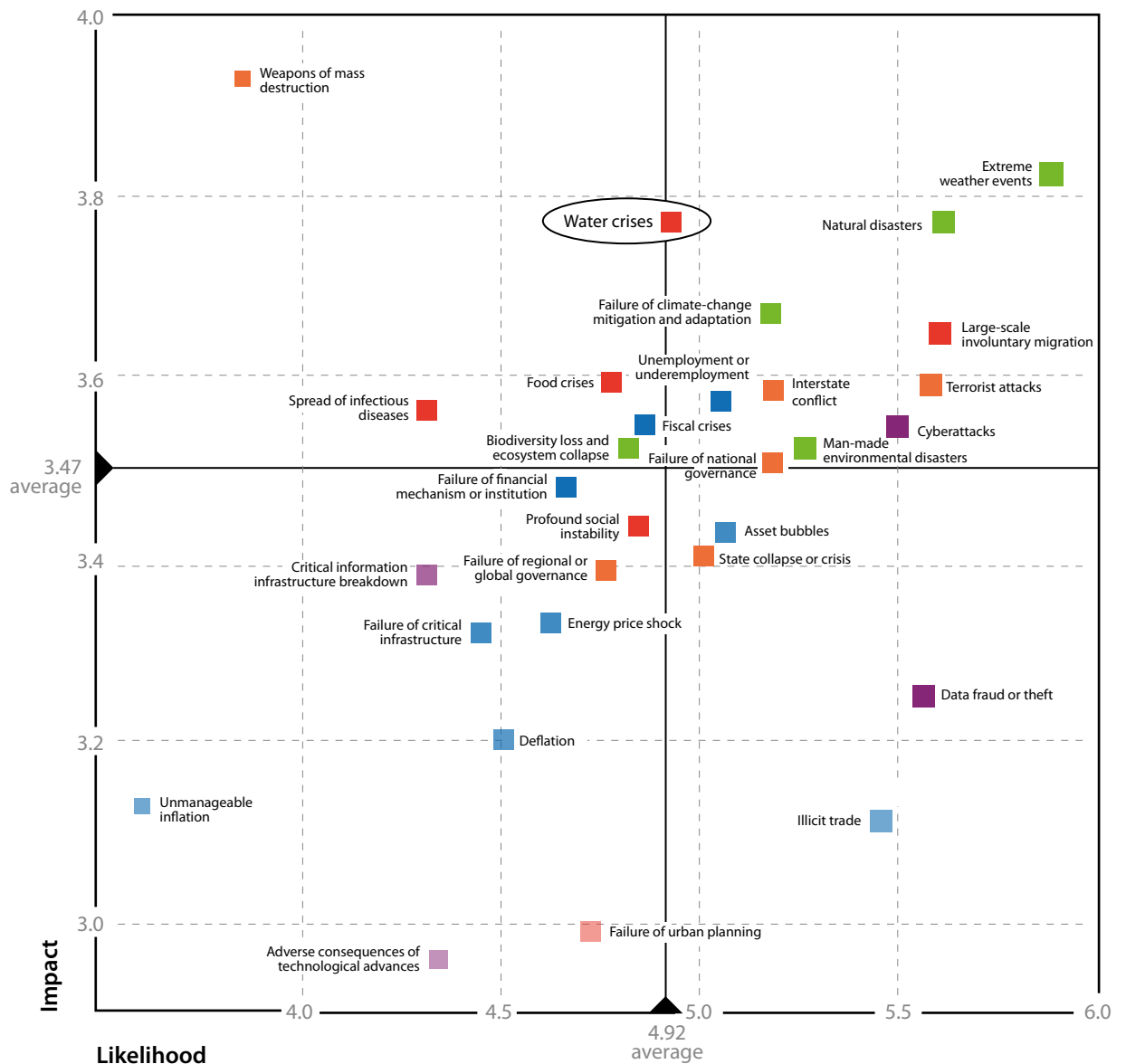
Source: OECD, DAC List of ODA Recipients ([www.oecd.org/dac/stats/daclist.htm](http://www.oecd.org/dac/stats/daclist.htm)); OECD, States of Fragility 2015 ([www.oecd.org/dac/governance-peace/](http://www.oecd.org/dac/governance-peace/)); Aqueduct Global Maps 2.1 Indicators; World Wildlife Fund (<http://waterriskfilter.panda.org/en/Maps/>); Shaded relief by Kenneth Townsend  
Map produced by Zoi Environment Network, March 2017

food availability and drive migration. The report states that current water management practices must change significantly to avoid growing competition over the resource, as agriculture, energy, industry and urban centres vie for their share of water. Growing water scarcity within countries will cause tensions between rural and urban areas, poorer and richer areas,

and also potentially between geographical regions. Moreover, the report points out that we are inadequately equipped to deal with such situations: more than 60% of the world's transboundary water basins are not governed by any type of cooperative management framework and even where such frameworks are in place, they do not include all countries in the basin.

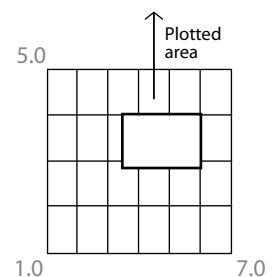


## The global risks landscape, 2017



Source: World Economic Forum Global Risks Perception Survey 2016

Note: Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 7, 1 representing a risk that is not likely to happen and 7 a risk that is very likely to occur. They also assess the impact on each global risk on a scale of 1 to 5 (1: minimal impact, 2: minor impact, 3: moderate impact, 4: severe impact and 5: catastrophic impact).



In 2015, an assessment of the performance of international water cooperation institutions by the Strategic Foresight Group<sup>7</sup> (SFG) found that there was a direct correlation between neighbourly relations and the level of water cooperation. The survey of the state of peace and stability around the world found that countries which scored high on water cooperation initiatives generally had a low incidence of war and conflict. It concluded that when two countries are actively working together on water, they will not go to war for other reasons.

Research by Aaron Wolf,<sup>8</sup> one of the leading scholars of international water and conflict, shows that even if water can act as an irritant in the relationship between countries, no wars over water have been recorded in modern times (the only known war over water was fought between two city states in the Euphrates-Tigris Basin in 2500 BC). Thus history and current research suggest that conflict as a means of water management and dispute resolution is rather unlikely. Overall, shared interests, human creativity and institutional capacity along a waterway seem to reduce the risk of conflict over water. Furthermore, once cooperative water frameworks are established through treaties, they prove to be impressively resilient, even when other tensions divide riparian neighbours and conflict erupts over other issues. This suggests that instead of being a source of conflict, shared water may be conducive to cooperation, with violent disputes occurring only in exceptional circumstances. Still, Wolf cautions that while there are no records of actual water wars in recent times, there is plenty of evidence that serious political instability has resulted from the lack of clean fresh water, which has occasionally spiralled into violent conflict. Regional stability can thus be directly affected by the progressive reduction in quality and quantity of available water resources (Map 2).

One of the interesting findings of Wolf's research is that most water conflict is caused by very rapid changes – either to institutional structures or physical conditions – that outpace the institutional capacity to deal with such change. Thus, according to Wolf, “the likelihood and intensity of dispute rise as the rate of change within a basin exceeds the institutional capacity to absorb that

change”. He concludes that the most common measures of water stress should therefore not be considered indicators of future conflicts in and of themselves.

An unprecedented number of people lack access to safe, reliable water supplies today. Moreover, as water from rivers and easily accessible groundwater are being used more intensively around the world, Wolf notes two major shifts: in many places, low water quality poses a greater threat than scarcity today, and users are increasingly turning to unconventional water sources that are not regulated by traditional governance frameworks. For example water drawn from deep fossil aquifers, the reuse of treated wastewater or inter-basin transfers are rarely subject to comprehensive management structures, which increases the potential for conflict, particularly if the resources are transboundary. The nature of water conflict is also changing: it is less traditional and more often sparked by internal and local pressures, or less tangible issues such as poverty, inequality and stability. Together with the physical changes to water resources, this suggests that “tomorrow's water disputes may look very different from today's”.

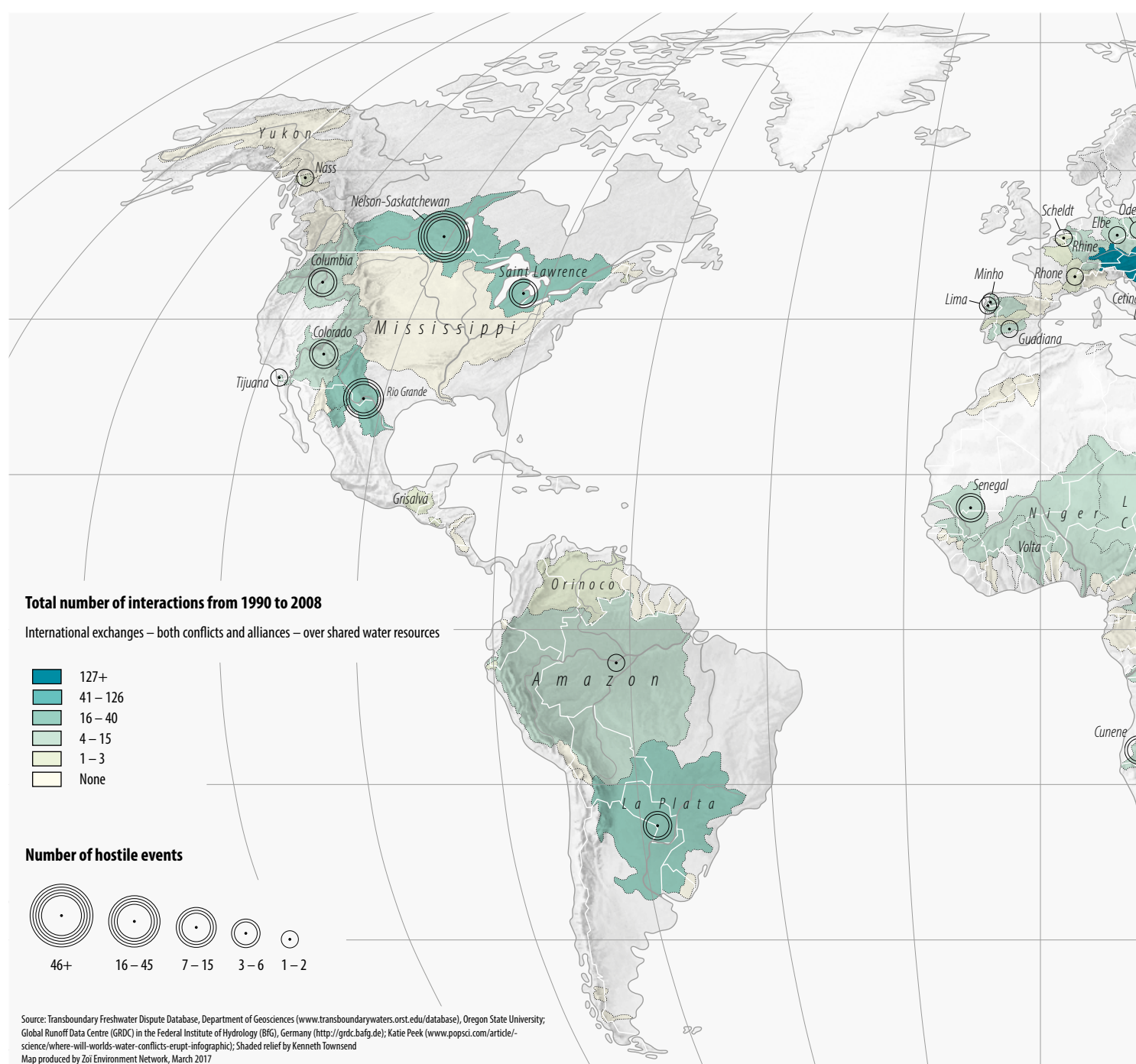
Indeed, water-related violence can look more like riots than wars, partly due to the shift from public to private financing of water infrastructure. The Earth Security Index 2016,<sup>9</sup> a report by the Earth Security Group (ESG), points to the growing risk of corporate-community water conflicts, with strong evidence that social groups in water-scarce areas are offering increased resistance to industrial projects. Around 70% of the operations of the world's six largest mining companies is concentrated in countries threatened by water scarcity. Popular opposition to mining activities has increased dramatically in water-insecure regions over recent years and such conflicts are likely to be further exacerbated as water, land and food security decline. A concrete example is Peru, where three mining projects with a total value of USD 7 billion have been blocked due to water-related conflicts with local communities. Moreover, companies withdrawing surface or groundwater in water-stressed regions may be perceived as a threat to local communities, even when they uphold stringent water-use efficiency

standards. For example, in 2014-15 Coca Cola reportedly abandoned two major bottling-plant projects in India worth a total of USD 106 million following protests by farmers worried about the degradation and depletion of local groundwater sources. ESG foresees greater potential for conflicts between communities and agribusiness as competition over water increases, food self-sufficiency declines and unemployment in local communities grows. Moreover, it notes that the global groundwater crisis, while hidden from corporate view, is already affecting companies in

the food and agriculture, power and water infrastructure, and extractives sectors.

A 2014 Adelphi Research report<sup>10</sup> on the rise of hydro-diplomacy examines how foreign policy can be strengthened to support transboundary cooperation. Besides valuable insights and recommendations by leading global scholars, the analysis includes many examples and case studies that strongly resonate with the experiences of the Swiss Agency for Development and Cooperation (SDC) discussed in the second part of

**MAP 2: Conflict and cooperation in transboundary basins**

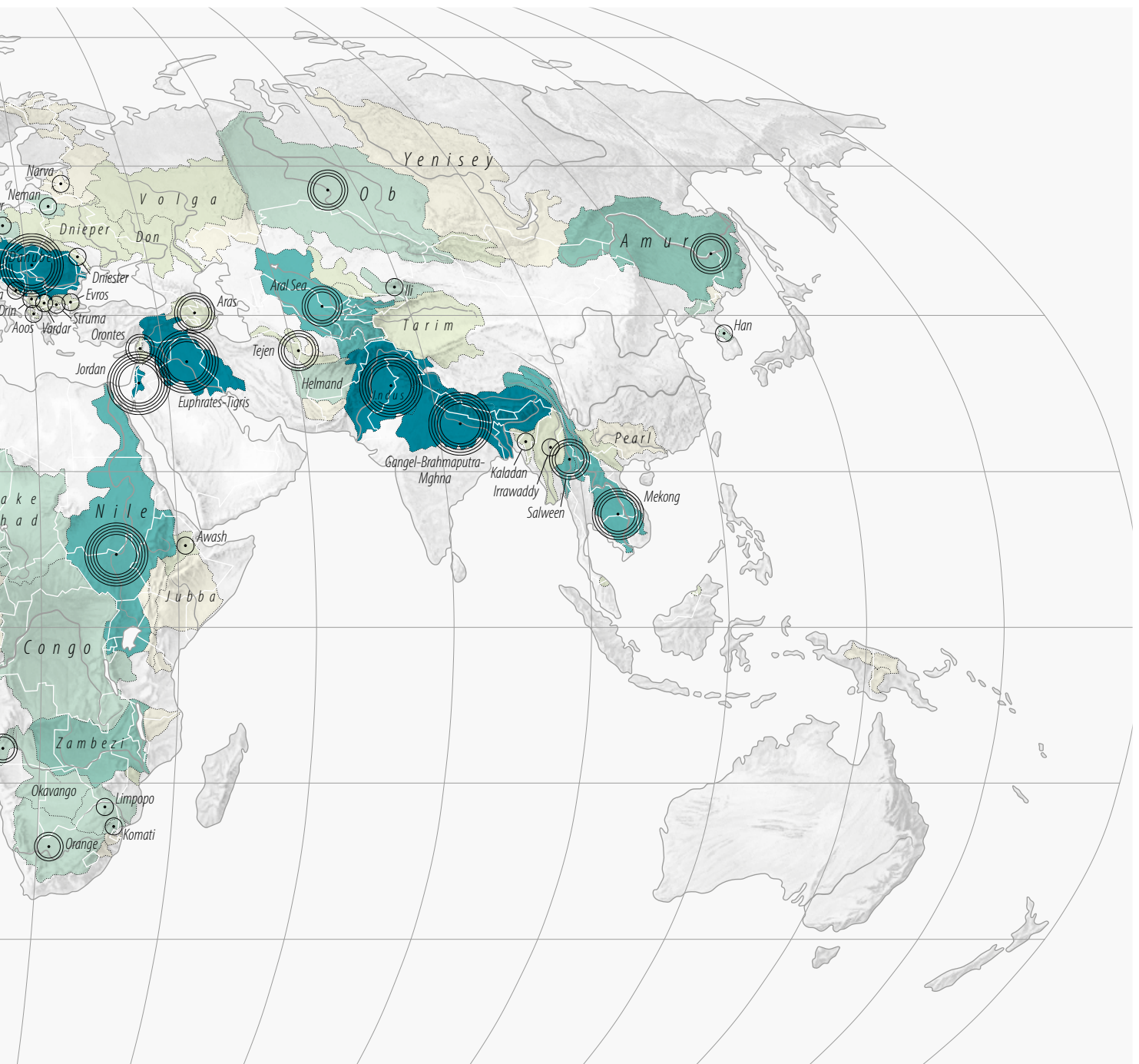


this publication. The report stresses that while there may be little historical evidence of formal water wars, this does not mean conflicts at other levels should be overlooked. Conflicts may not centre on water, and politics or other issues may dominate, but water can nonetheless be one of the elements that drive conflict.

*“Water can create tensions and is an issue in intergovernmental negotiations, but it is primarily an opportunity for cooperation and rapprochement between countries with transboundary water resources.”*

*Peter Maurer, president of the International Committee of the Red Cross*

**This map shows conflicts and alliances in transboundary river basins. It is based on water seismograph data from the Transboundary Freshwater Dispute Database at Oregon State University,<sup>11</sup> and is inspired by a Katie Peek map published in Popular Science.<sup>12</sup>**



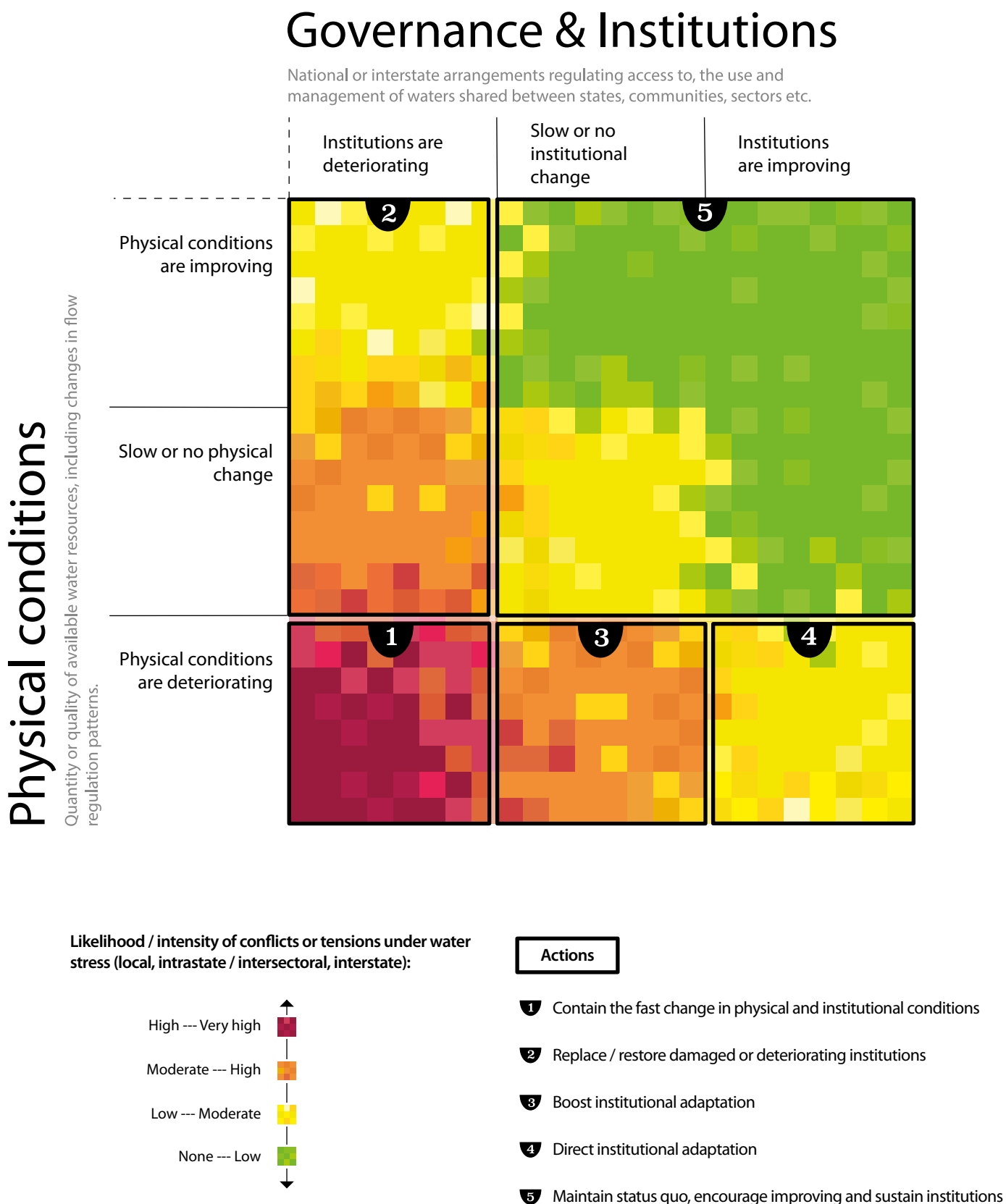
Zooming in to the national scale, the Adelphi report finds that within countries a broad range of sectors – from agricultural production and rural livelihoods to municipal water supply and sanitation, power generation and public health – can be negatively affected by insufficient and irregular access to water, which in turn creates security risks at the subnational level. Sharing the costs of climate change across society may prove challenging in some affected countries, triggering protests from certain groups and damaging the government’s perceived legitimacy. Climatic changes may for example force pastoralists in the Horn of Africa – who are often armed – to seek new grazing lands for their herds, while drought may force impoverished Afghan farmers to abandon their land and move to the capital Kabul. Such situations could further damage social and political stability and heighten the risk of violent conflict. The report concludes that such situations can only be tackled by resilient institutions that are forward looking and “politically wise”.

Climate change introduces new uncertainty in an already unpredictable situation, undermining the stability of cooperation and further complicating the management of the rapid physical changes discussed above. Already in 2008, the German Advisory Council on Global Change reviewed<sup>13</sup> major global climate-security hotspots. In most places, water stress or deteriorating water quality were determining factors. Many basin-level institutions lack flexibility and do not have the resilience to face the impacts of climate

change. Findings from Adelphi Research<sup>14</sup> from 2016 suggest that in transboundary river basins, climate change is likely to negatively affect interstate relations and contribute to conflict. Furthermore, existing water institutions that fail to adapt to the changing conditions could be destabilized by the impacts of climate change. As a result, emerging disputes in transboundary basins – most of which have no formal agreements or River Basin Organizations in place – are increasingly likely to require diplomatic and foreign policy support.

**This atlas uses the work of Aaron Wolf to develop a simple conceptual diagram that presents water conflicts along two axes: changing physical conditions versus shifts in the state of water governance. Rather than focusing on the general state of water availability and governance indicators – as some current research and analyses do – this atlas concentrates on the dynamics, examining whether conditions along both axes are deteriorating or improving and at what rate. The model combines quantitative analysis with a qualitative assessment and aims to stimulate discussion among experts, stakeholders and the general public. The model can be used at different levels, showing the situation in water basins from the broad regional to a very local scale. The pixilation is a visual reminder that such models inevitably always contain a certain degree of uncertainty and subjective judgment.**

**FIGURE 2**  
**Conceptual model: The world of water conflicts**

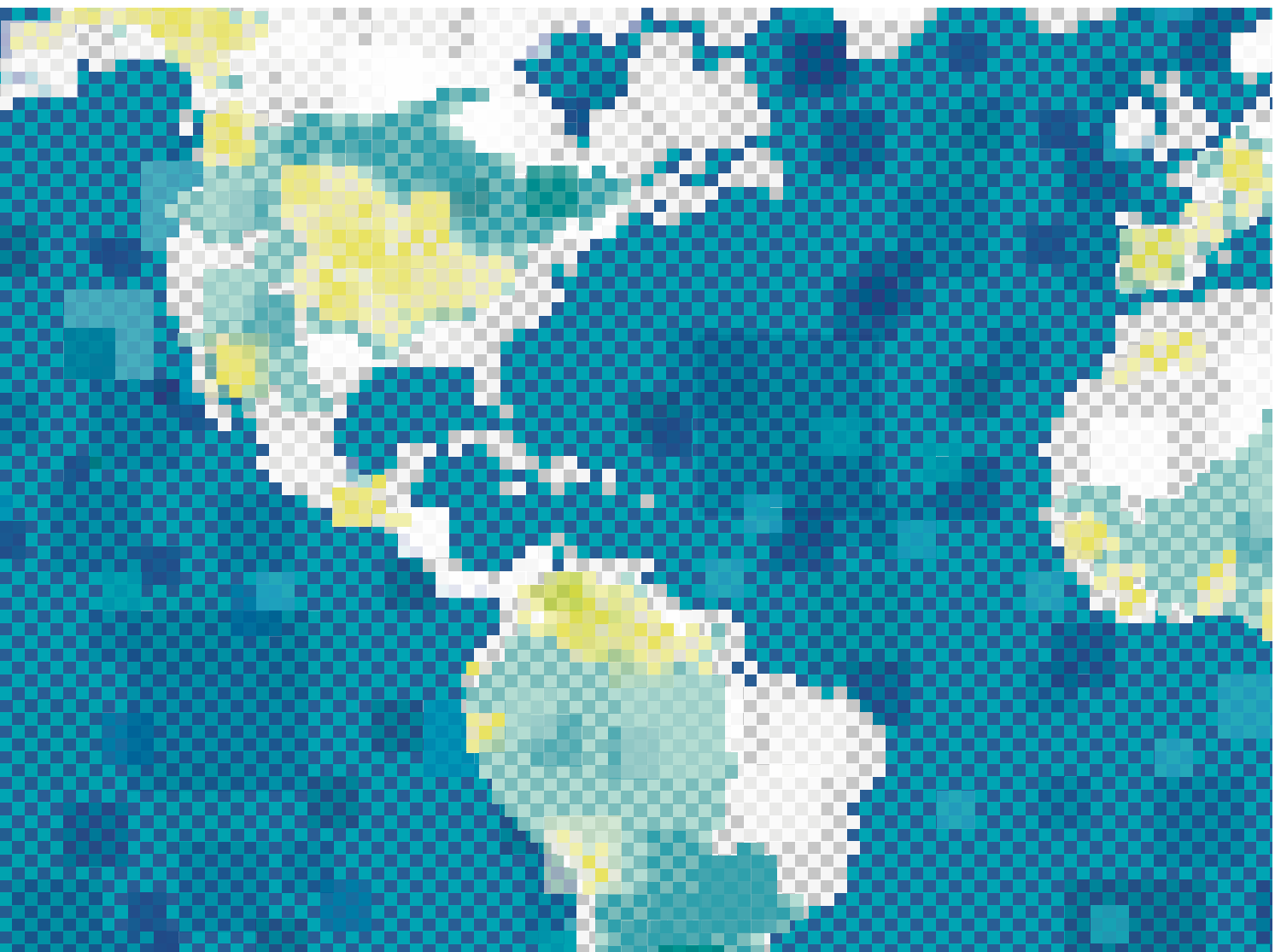


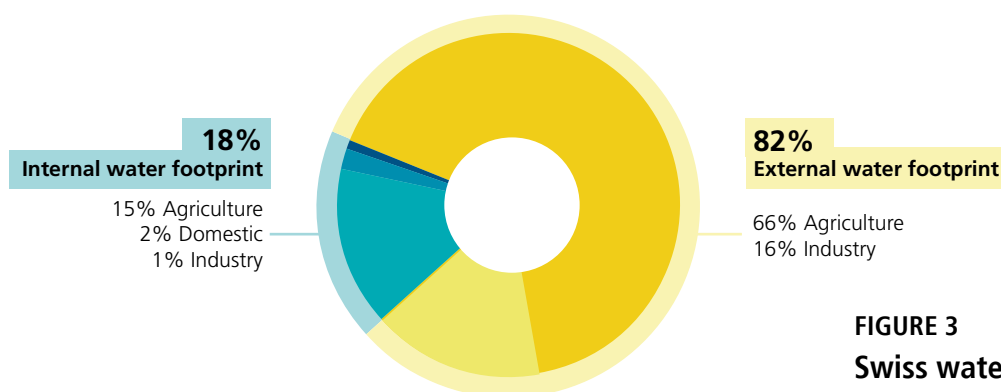
# PART II OPPORTUNITIES AND SOLUTIONS

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## The Swiss water and security toolbox

Switzerland attaches great importance to promoting peace, human rights, economic growth and environmental sustainability around the world. As the water tower of Europe, Switzerland strives to be an exemplary upstream country, devoting great effort to delivering adequate quantities of good quality water to its neighbours, and to help absorb flood shocks to avoid major disasters downstream. Yet because of its high living standards, Switzerland's water footprint is much larger than the world average. As a result of water-intensive imports, such as food items, 82% of Switzerland's water footprint – the total volume of precipitation, surface and groundwater used globally for the production of goods and services consumed in Switzerland – are generated outside the country, often in regions where water resources are less abundant or even scarce.<sup>15</sup> This underlines the relevance of Switzerland's engagement in and sense of responsibility towards the resolution of global water issues – not just out of international solidarity, but also because its own development depends on it.





**FIGURE 3**  
**Swiss water footprint of consumption**

*“The water crisis is a global challenge, which is why we need global solutions. The actions of one country alone cannot solve a problem of this complexity. Switzerland recognises the need to seek global commitment, to ensure swifter action is taken and to coordinate solutions.”*

**Didier Burkhalter, Swiss Federal Councillor**

Water is a new shared challenge that brings people and governments together to seek innovative solutions. Policy-makers are increasingly prepared to discuss transparent, coherent and cost-efficient policies, laws and institutional responsibilities, including regulation and compliance mechanisms for sustainable water resource management at local, national and regional levels.

Tackling water risks is not just an imperative, but also an opportunity to lay the basis for a water-secure world where people have the capacity to safeguard sustainable access to adequate quantities of acceptable-quality water and adequate and equitable sanitation to sustain livelihoods, human well-being and socio-economic development; can protect themselves against waterborne pollution and diseases and water-related disasters; can preserve ecosystems in a climate of peace and political stability; and where water is a catalyst for cooperation rather than a source of conflict. Switzerland played an instrumental role in the definition and adoption of United Nations Sustainable Development Goal (SDG) 6: to ensure availability and sustainable management of water and sanitation for all.<sup>16</sup> SDC interventions are designed to help resolve protracted water conflicts. However, they also strive to foster trust beyond the domain of water in the

hope of building strong relationships and thus preventing future conflicts, including those related to water management. As the water tower of Europe and an experienced diplomatic broker with solid technical, scientific and political expertise, Switzerland works closely with its network of partners to build a more secure future.

This atlas focuses on concrete SDC solutions and products, consisting of interventions supported by the Global Programme Water (GPW), the South Cooperation, the Cooperation with Eastern Europe and the Swiss Humanitarian Aid (SHA) unit. The pillars of the Swiss toolbox for water and security, which form the conceptual base of SDC's work, are described below (Figure 3).

The SDC portfolio is built on the principles of sharing social, economic, environmental and political benefits. SDC's new global engagement transcends traditional models of development cooperation to combine the promotion of peace with the sustainable management of water resources. The Blue Peace framework, which Switzerland launched in 2009 with its partners, allows SDC to partner with political leaders worldwide to address the critical challenges of water security by developing joint solutions for sustainable regional water management. The same principles apply to other initiatives that SDC supports, such as Building River Dialogue and Governance (BRIDGE), implemented by IUCN, Governance of Groundwater Resources in Transboundary Aquifers (GGRETA), implemented by UNESCO, the UNECE Water Convention and others, which are described in more detail in Part III.

## **SWISS TOOLBOX PILLAR 1:**

### **Engaging the network for political dialogue**

Switzerland has an innovative approach to engaging political leaders, officials, as well as the general public, parliament, civil society, the academic sector and the media in order to harness and manage collaborative solutions for sustainable regional and basin water management. The approach lays the foundations for the development of a regional political and diplomatic community and creates new opportunities for the resolution of protracted water-related conflicts. It allows for issues related to regional water management to be negotiated at a higher level. It introduces a new form of collaboration at basin level, based on mutual understanding between politicians, water experts, users and local communities, and creates new opportunities for basin-wide learning. An important subset of this work is capacity building to develop a common understanding of governance principles and to engage local populations in water management processes. At the request of riparian countries, the initiative is examining present and future water security issues in specific river basins and regions, and exploring ways to implement innovative short-, medium- and long-term recommendations to catalyse improved water management.

## **SWISS TOOLBOX PILLAR 2:**

### **Implementing tangible joint strategic operations**

The SDC initiatives apply recommendations through concrete, realistic, consensual and innovative joint initiatives that catalyse improvements to water management in the basins in which SDC operates. Water diplomacy and policy dialogue benefit from joint hydrological modelling and monitoring, and SDC supports common standards for the quantification, management and exchange of water data in various basins. Furthermore, SDC contributes to the development of transboundary master plans, basin legal frameworks and management institutions that balance the needs of agriculture, industry, households and ecosystems.

## **SWISS TOOLBOX PILLAR 3:**

### **Communication and advocacy**

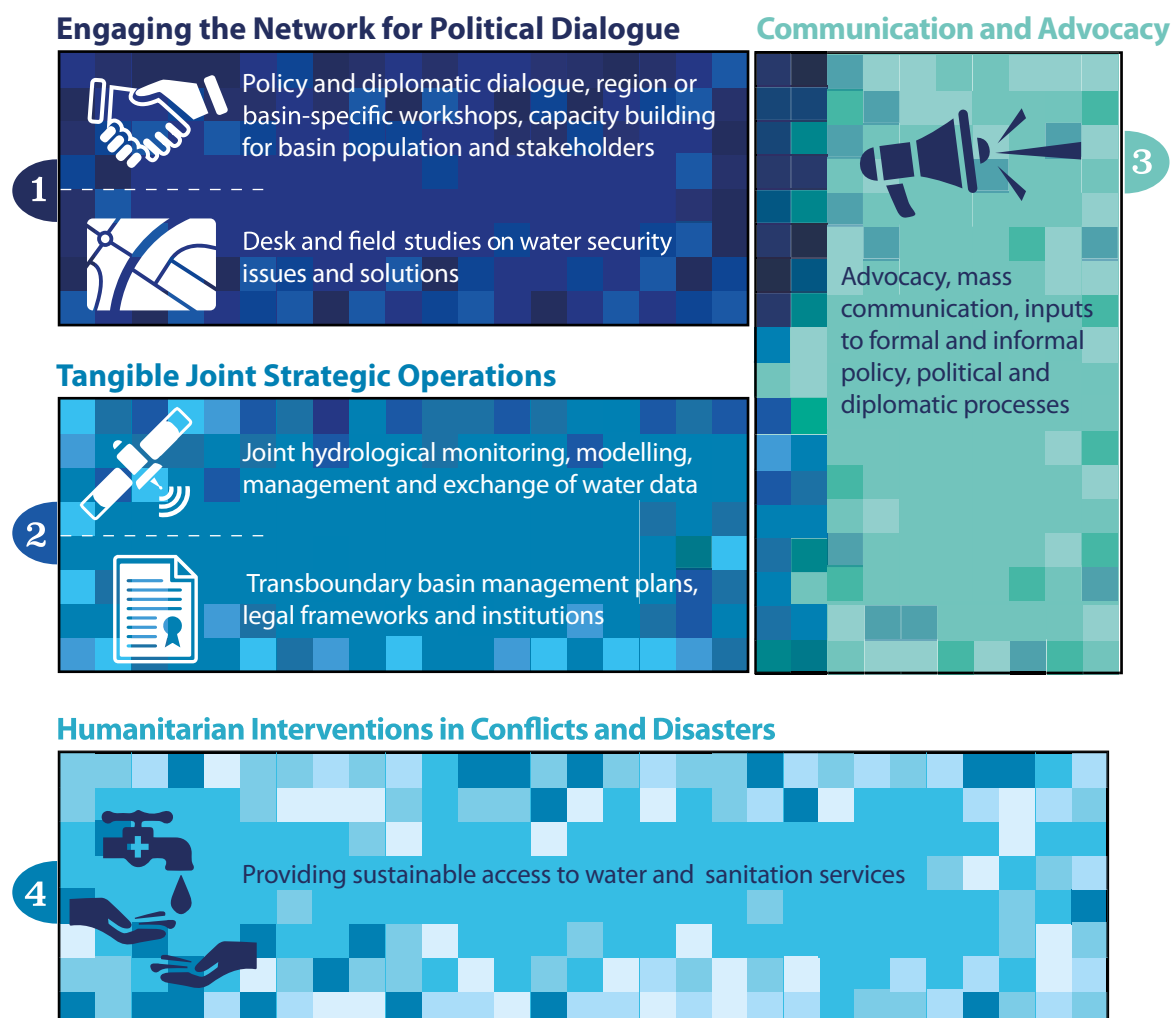
The first two pillars enable concrete steps forward, and the results obtained at basin level are used within existing or newly created regional mechanisms and dialogue platforms. This mobilizes various advocacy networks, which in turn engage with the media and communicate through formal and informal channels to policy, political and diplomatic processes. This means support for enhanced water management is collectively expressed, thus strengthening the basis of the principles of water cooperation.

## **SWISS TOOLBOX PILLAR 4:**

### **Humanitarian interventions in conflicts and disasters**

A fourth pillar of activities is the humanitarian assistance provided in the context of conflicts and disasters. These actions are designed to provide sustainable access to water and sanitation, and are usually implemented by humanitarian organizations, United Nations agencies and Non-Governmental Organizations (NGOs). Part of these interventions are aimed at risk prevention to minimize the impacts of conflicts and disasters such as floods and droughts.

**FIGURE 4**  
**Swiss water and security toolbox**



Note: While there is no hierarchy between the various tools – all of them are equally relevant – it is important to apply the right mix. The icons designate specific areas of activity and are used in the legends of the maps in Part III.

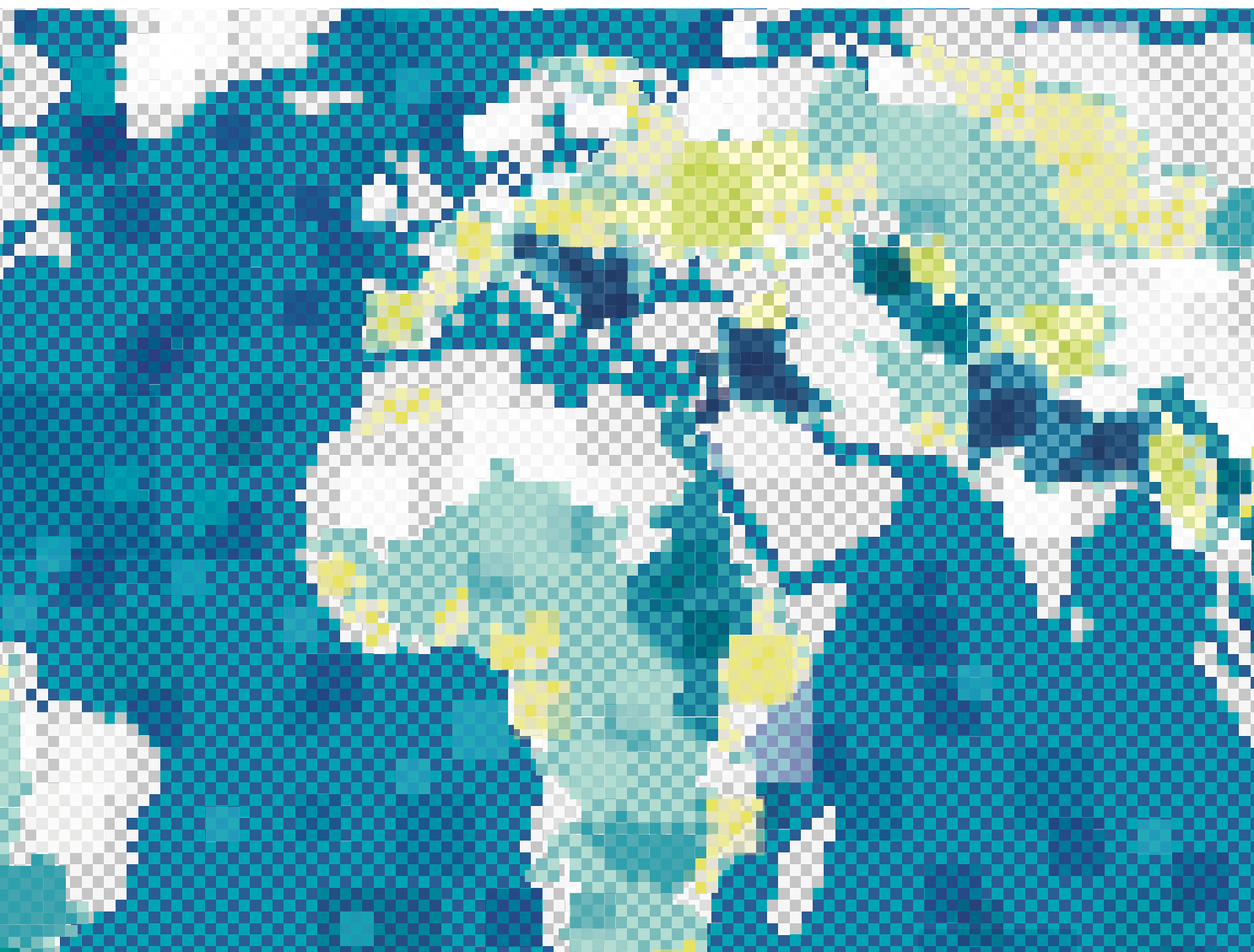
## PART III MAPPING SDC INITIATIVES

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This section provides a global overview of SDC's portfolio in the realm of water and peace. It features a series of continental and regional maps that highlight the following elements:

- The transboundary basins in the different regions
- The basins in relation to the dynamics of the physical conditions and institutional frameworks (Figure 2)
- The different types of SDC interventions (Figure 4)

The maps were designed to enable easy reading and understanding by non-specialists. They are accompanied by short texts that highlight key project features as well as quotes from beneficiaries where available. The atlas gives readers an insight into the complexity of the water, conflict and cooperation issues in the various regions of the world, but also shows how SDC contributes to finding solutions. The aim is to create greater awareness and stimulate further engagement among readers.

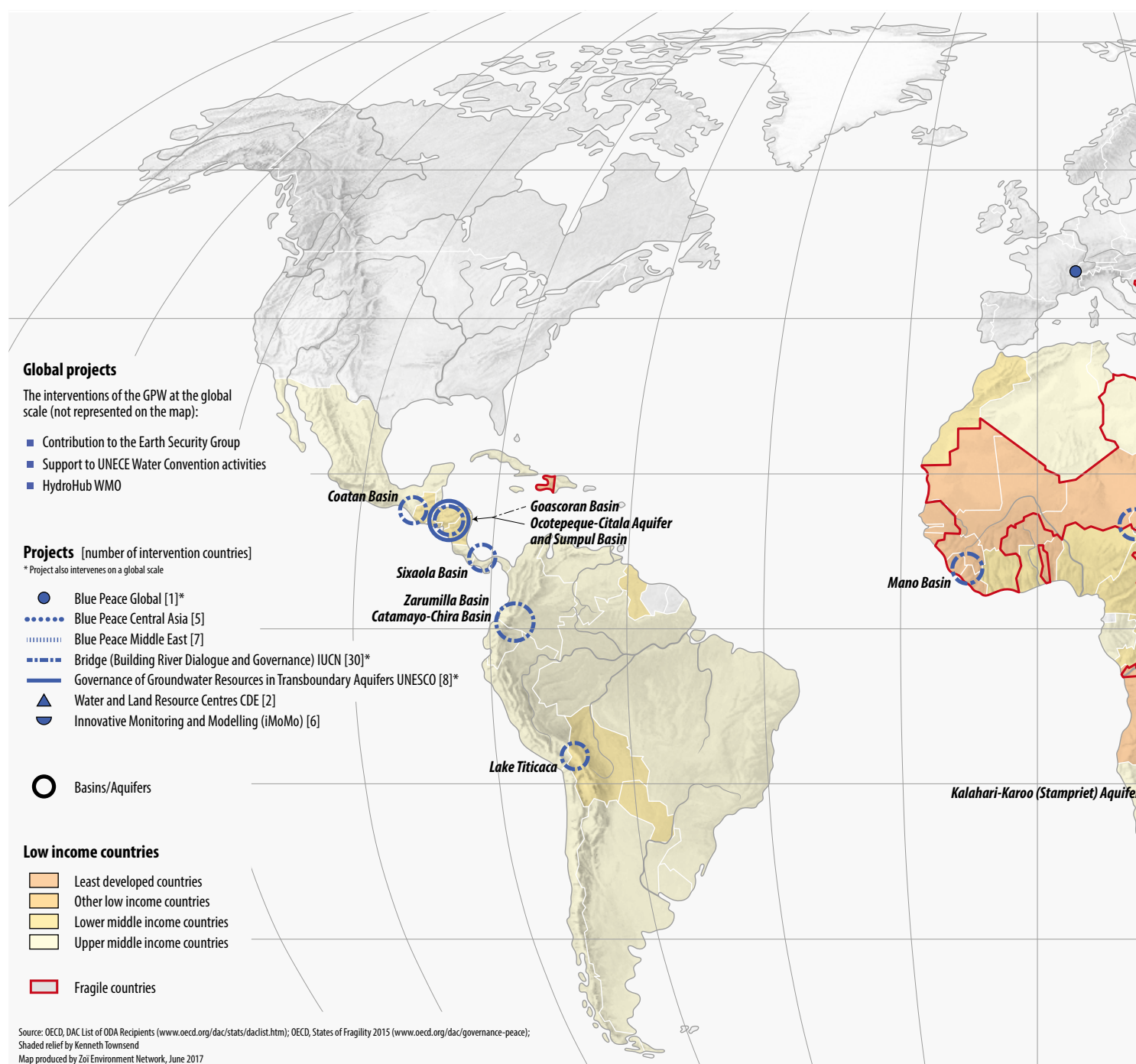


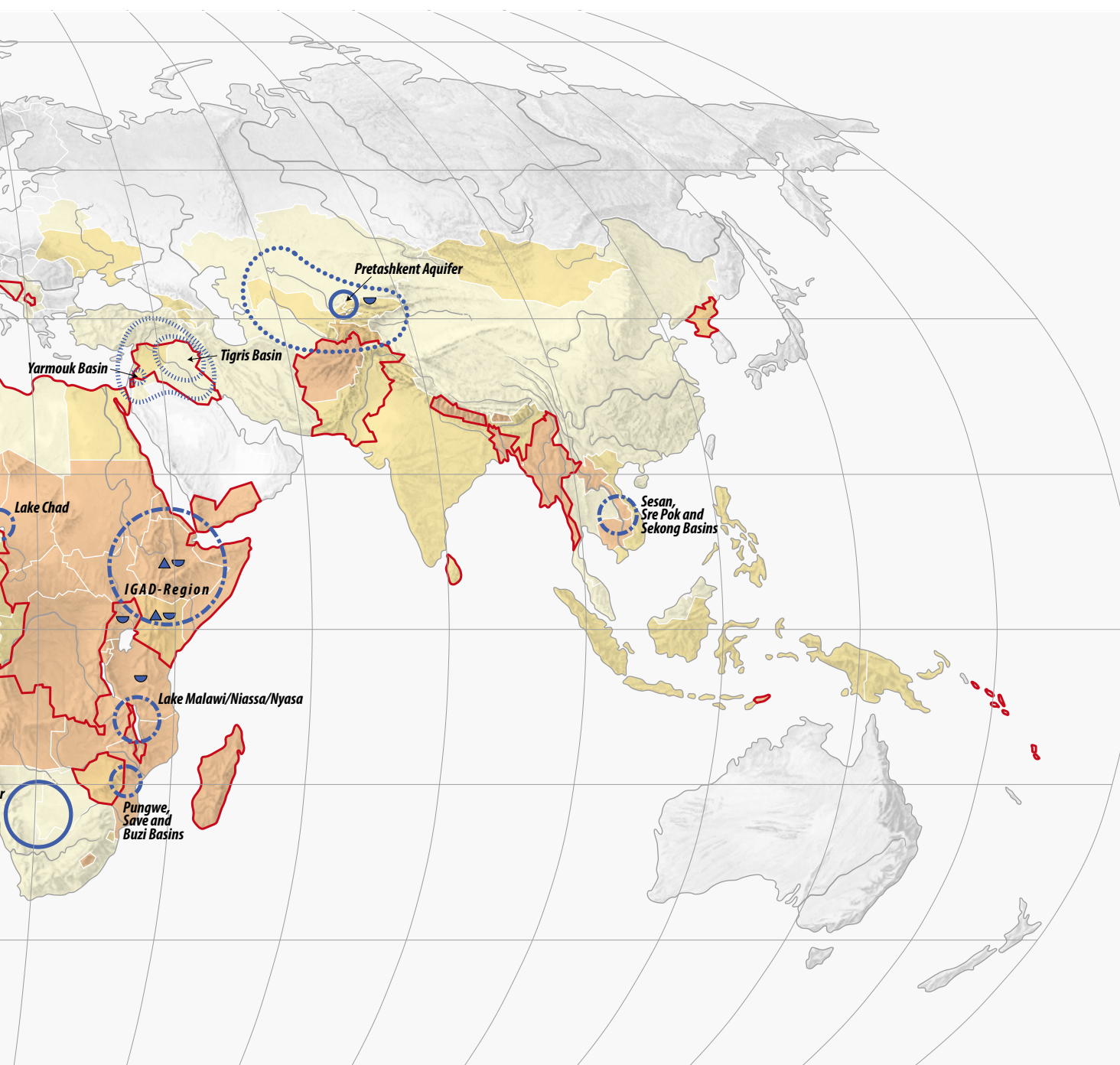
**TABLE 1**  
**Initiatives and Instruments of the Global Programme Water**

PROGRAMME	ACTIVITIES AND PURPOSES	SCOPE
<b>Blue Peace Global; Global High-Level Panel on Water and Peace; Geneva Water Hub</b>  <b>Geneva Water Hub</b> <a href="http://genevawaterhub.org">genevawaterhub.org</a> Strategic Foresight Group <a href="http://strategicforesight.com">strategicforesight.com</a>	Strengthening the global architecture to prevent and resolve water-related conflicts; facilitating the use of water as an important factor in peace building  Leveraging resources available within the international organizations based in Geneva to develop the hydro-politics agenda	Global
<b>HydroHub (Global Hydrometry Support Facility and Innovation Hub)</b>  <b>WMO</b> <a href="http://www.wmo.int">www.wmo.int</a>	Developing a reliable base of hydrological data to foster evidence-based policy-making and decision-making and to support conflict resolution in water resources management	Global
<b>Innovative Monitoring and Modelling of Water Resources (iMoMo)</b>  <b>iMoMo Consortium</b> <a href="http://www.imomohub.org">www.imomohub.org</a>	Developing and deploying low-cost, decentralized and people-centred hydrological data systems for decision-making in water resources management	Eastern and Southern Africa, Central Asia
<b>Earth Security Index</b>  <b>Earth Security Group</b> <a href="http://www.earthsecuritygroup.com">www.earthsecuritygroup.com</a>	Bringing simplicity to the various resource pressures undermining sustainable development  Providing leaders in government, the private sector and civil society with a data-driven visual synthesis of country priorities	Global
<b>UNECE Water Convention</b>  <b>UNECE</b> <a href="http://unece.org/env/water.html">unece.org/env/water.html</a>	Supporting the implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes by promoting its adoption outside the UNECE region and by providing tools and guidance	Global
<b>Building River Dialogue and Governance (BRIDGE)</b>  <b>IUCN</b> <a href="http://www.iucn.org/theme/water/our-work/bridge">www.iucn.org/theme/water/our-work/bridge</a>	Developing capacity to implement effective water governance through training, empowering champions and advising on institutional and legal frameworks	Africa, Central America, South America and Southeast Asia
<b>Governance of Groundwater Resources in Transboundary Aquifers (GGRETA)</b>  <b>UNESCO</b> <a href="http://www.groundwatercop.iwlearn.net/ggreta">www.groundwatercop.iwlearn.net/ggreta</a>	Generating data and information on the physical and socio-economic characteristics of transboundary groundwater resources to support the establishment of joint governance mechanisms between countries	Central America, Central Asia and Southern Africa
<b>Water and Land Resource Centres (WLRCs)</b>  <b>CDE, University of Bern</b> <a href="http://www.cde.unibe.ch">www.cde.unibe.ch</a>	Improving the generation, use and dissemination of data and information on hydrology, meteorology and land management to inform water and land policies and decision-making	Ethiopia and Kenya
<b>Blue Peace Middle East</b>	Contributing to peace building and strengthening cooperation on sustainable management of shared water resources through combined political and technical dialogues, which are substantiated in concrete regional projects and direct impact activities on the ground	Middle East
<b>Blue Peace Central Asia</b>	Catalysing and facilitating high-level political dialogue on transboundary water management  Supporting diplomacy with concrete activities on data sharing, adoption of water quality norms and shared management of investments and infrastructure	Central Asia

This global overview map highlights initiatives and projects supported by the SDC Global Programme Water.

### MAP 3: Water as an Asset for Peace - Projects of the Global Programme Water

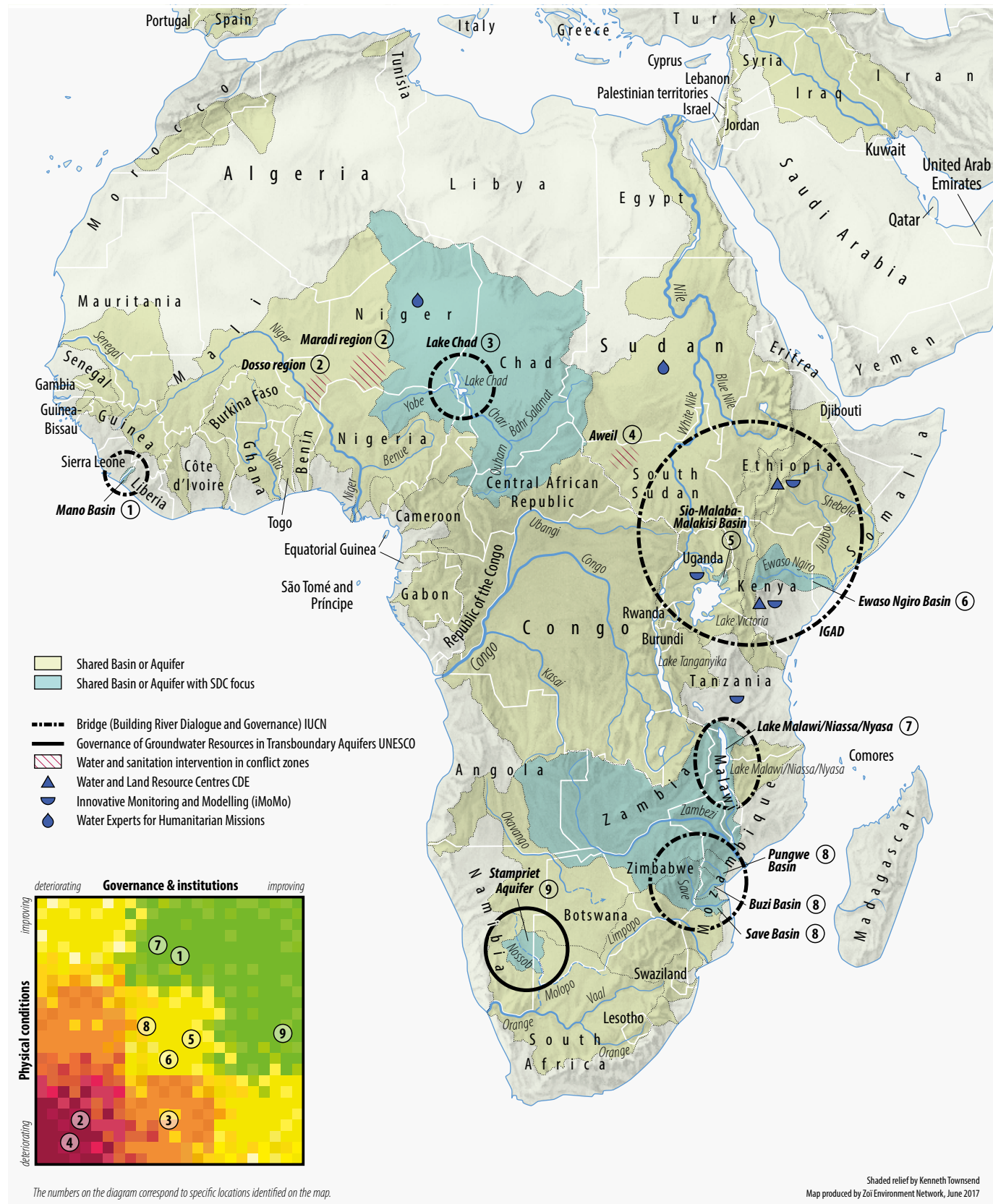




# AFRICA

Water, conflict and cooperation issues in Africa are highly complex and diverse. In some regions – the Horn of Africa, the Maghreb and Southern Africa – physical water scarcity is prevalent, while other parts of Africa experience economic water scarcity and inadequate access to water due to poverty, poorly functioning institutions and conflicts. SDC's engagement in Africa covers a wide range of instruments:

MAP 4: Africa



The numbers on the diagram correspond to specific locations identified on the map.

- BRIDGE in five basins across the African continent
- WLRCs in Ethiopia and Kenya
- GGRETA in the Stampriet Aquifer
- Hydrometry support (iMoMo) in Ethiopia, Kenya and Tanzania
- Various humanitarian interventions in Niger, South Sudan and Sudan

In addition to the continental overview Map 4, Maps 5 and 6 respectively zoom into the Intergovernmental Authority on Development (IGAD) and the Southern African Development Community (SADC) regions to show the complexity of trans-boundary basins in Africa.

## WEST AFRICA: Lake Chad, Niger and South Sudan

### Mano River Basin ①



#### Shared vision and institutional framework

The Mano River originates in the Guinea Highlands, forming the border between Liberia and Sierra Leone further downstream. Despite a wealth of natural resources, the region has a high level of poverty due to conflict.

In the Mano River Basin, BRIDGE prioritizes support for the establishment of legal and institutional frameworks for water governance reform. The project will initially focus on facilitating a shared vision for the Mano, supported by an action plan for sustainable development as a starting point for potential development of a basin-wide water charter.

### Western Niger ② (Maradi and Dosso districts)



#### Water infrastructure and management

In the Sahel, water sharing between farmers and pastoralists can be highly problematic and conflictual. About 180,000 people benefit from the innovative Swiss engagement in the *Programme d'Hydraulique Rurale et d'Appui au Secteur de l'Eau et Assainissement (PHRASEA)* project, supporting water infrastructure development and management in Niger's Dosso and Maradi districts.

### Lake Chad Basin ③



#### Support to the Lake Chad Basin Commission

The Lake Chad Basin, a region endowed with rich agricultural and pasture land, has recently turned into an environmental hotspot. Over-exploitation of water resources and the impacts of climate change have caused the lake's surface to shrink from 25,000 km<sup>2</sup> in the 1960s to 4,800 km<sup>2</sup> today. Rapid population growth places further pressure on the water resources in the basin, which is shared by Cameroon, Chad, the Central African Republic, Libya, Niger and Nigeria. These countries are also members of the Lake Chad Basin Commission, which was set up in 1964 by the countries bordering the lake (Cameroon, Chad, Niger, Nigeria).

In the Lake Chad Basin, BRIDGE mainly supports existing initiatives and strengthens institutional arrangements already in place, in particular the Basin Commission. Priorities include facilitating Integrated Water Resources Management (IWRM), producing and distributing thematic basin maps and supporting the countries in the ratification of the Lake Chad Basin Water Charter.

### South Sudan (Aweil) ④



#### Local water supply

In addition to suffering from larger-scale conflicts, villagers and nomads in South Sudan's Aweil region frequently clash over issues related to water use. The SHA unit supports a project that provides a stable water supply to more than 100,000 people. The rehabilitation of infrastructure helps reduce the incidence of local conflicts.

## African Great Lakes, Horn of Africa and Nile Valley

The IGAD region extends over 5.2 million km<sup>2</sup>, covering Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan and Uganda (Map 5). Transboundary water and security issues in this region are of global geopolitical significance, but ongoing conflicts in Somalia, South Sudan and Sudan make cooperation difficult at times. BRIDGE delivers general support to the IGAD Secretariat to coordinate their efforts in the water sector, build capacity and facilitate dialogue.

### Ethiopia, Kenya



#### Water and Land Resource Centres

Switzerland has a long-standing engagement in the region. The WLRC in Kenya was established in 2002, building on research projects that were launched in the 1970s. The WLRC in Ethiopia opened in 2011. These two centres contribute to sustainability research, shared information bases and the promotion of best practices, which are all vital for decision-making in water and land resources management.

due to agricultural practices and exploitation of resources – such as the removal of sand from the riverbanks – are issues of concern. Around 85% of the basin's 4 million inhabitants is employed in agriculture.

In 2016, the Sio-Malaba-Malakisi Basin was selected as a BRIDGE demonstration project, with an initial focus on assessing the benefits of transboundary water cooperation and the launch of a participatory process to develop future scenarios.

### Ethiopia, Kenya, Tanzania, Uganda



#### Innovative Monitoring and Modelling (iMoMo)

The SDC-supported iMoMo activities in Kenya, Tanzania and Uganda have injected new impetus for innovation, with the promotion of new technologies for monitoring, modelling and managing water.

### Ewaso Ngiro Basin ⑥



#### Knowledge base

The Ewaso Ngiro River originates in the Mount Kenya region of Kenya and flows west into an increasingly arid landscape to join the Jubba River in Somalia. The river ecosystem is crucial to sustaining the growing number of people living in the basin, but unsustainable agricultural practices upstream are increasingly threatening the sustainability of downstream livelihoods. Climate change exacerbates the situation by increasing negative impacts on the ecosystem.

### Sio-Malaba-Malakisi Basin ⑤



#### Strengthening transboundary water governance and cooperation

The Sio-Malaba-Malakisi sub-basin of the Nile is shared by Kenya (upstream) and Uganda (downstream). The basin is rich in natural endowments and has a high potential for development. However, catchment and water-quality degradation

Long-term SDC-supported research led by WLRC has tremendously increased the knowledge and information base on water- and land-use regimes and practices in the Ewaso Ngiro Basin.

MAP 5: Africa IGAD Region: African Great Lakes, Horn of Africa and Nile Valley



- Shared Basin or Aquifer
- Shared Basin or Aquifer with SDC focus

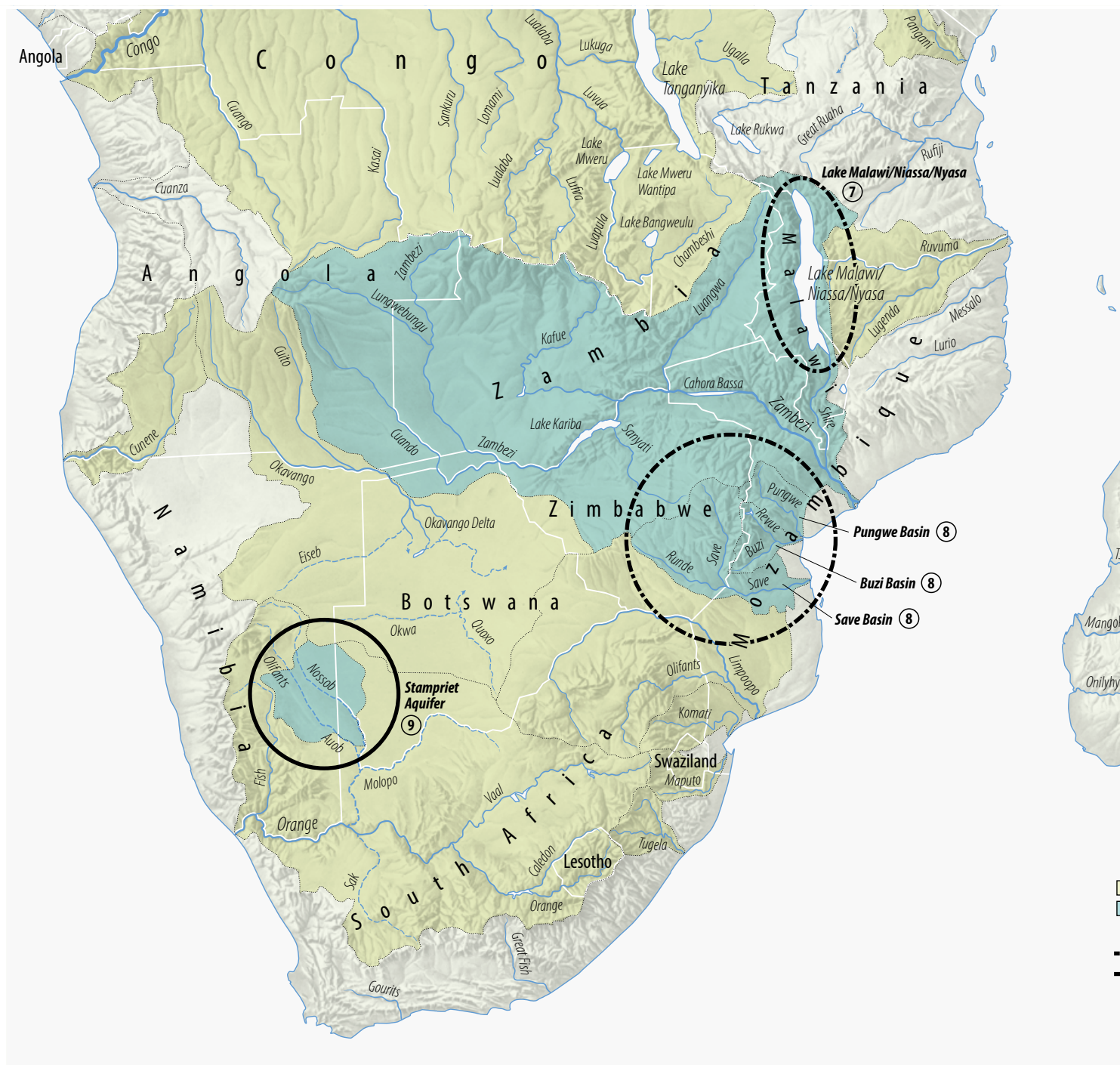
- Bridge (Building River Dialogue and Governance) IUCN
- Water and Land Resource Centres CDE
- Innovative Monitoring and Modelling (iMoMo)
- Water Experts for Humanitarian Missions

# SADC REGION

## Southern Africa

The SADC region comprises 15 member states: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe (Map 6). Water and peace issues are as complex as the region itself, with areas of distinct water scarcity in the south, while further north, areas of relative water abundance still experience water insecurity because poverty and conflicts complicate access.

MAP 6: Africa SADC Region



## Lake Malawi/Niassa/Nyasa ⑦



### Ecosystem approaches to Integrated Water Resources Management

The Lake Malawi region, also known as Lago Niassa in Mozambique and Lake Nyasa in Tanzania, is an extraordinarily rich ecosystem in a region with considerable development potential. In addition to long-standing and continuing disputes about their national borders, Malawi and Tanzania have transboundary conflict and cooperation issues in the basin. Water resource exploitation already affects the level of the lake, and the fisheries and agriculture sectors face potential competition from the emerging mineral, oil and gas exploration sector.

BRIDGE activities, implemented in cooperation with the Zambezi Watercourse Commission, focus on training and capacity building, in which ecosystem approaches are linked to the implementation of IWRM.

## Pungwe, Buzi, Save Basins ⑧



### Support to the bilateral water commission

The Pungwe, Buzi and Save Basins are shared by Zimbabwe (upstream) and Mozambique (downstream). The three basins are mostly rural: agriculture is the main economic activity and the main water user. Most of the pollution originates from agriculture, human settlements and limited artisanal mining activities. Joint water commissions are key instruments for cooperation.

BRIDGE addresses some of the riparian countries' cooperation needs. Furthermore, it prioritizes dialogue and consensus building, along with technical support to make the bilateral Joint Water Commission operational and establish other stakeholder frameworks.

## Stampriet Aquifer ⑨



The Stampriet Aquifer is shared by Botswana, Namibia and South Africa and lies within the Orange River Basin. As the main source of water in the area, the aquifer is used for drinking water purposes and in the agricultural sector – for irrigation and to water livestock. The aquifer is currently not threatened by over-exploitation or pollution, but this could change rapidly as the basin population grows.

The three countries already cooperate through regional bodies such as the Orange-Senqu River Commission and the SADC, but there is no specific legal instrument for the management of the Stampriet Aquifer. The countries have already agreed on the designation, delineation and the conceptual hydrogeological model of the aquifer. The UNESCO GGRETA activities focus on bridging the gaps in data, monitoring and information systems, with the aim of eventually having the countries share responsibility and management of the resource.



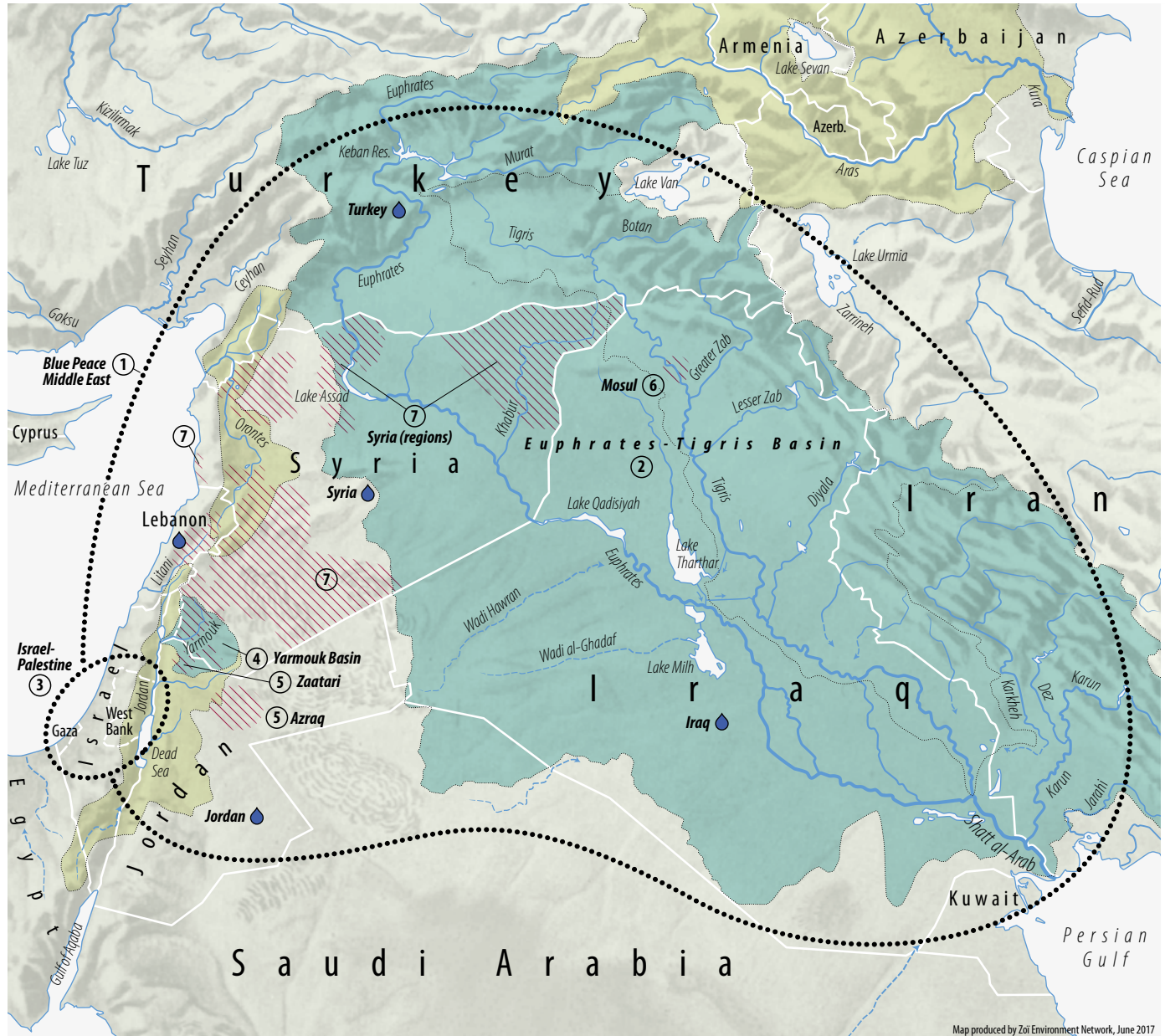
- Shared Basin or Aquifer
- Shared Basin or Aquifer with SDC focus
- Bridge (Building River Dialogue and Governance) IUCN
- Governance of Groundwater Resources in Transboundary Aquifers UNESCO

Shaded relief by Kenneth Townsend  
Map produced by Zoi Environment Network, June 2017

# MIDDLE EAST

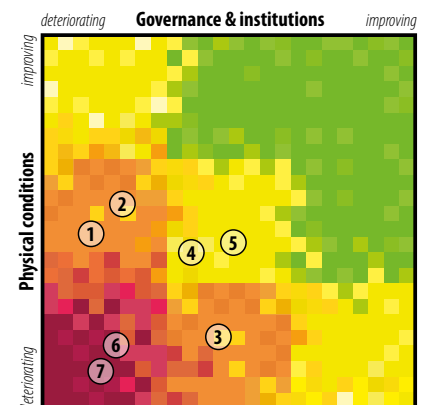
The Middle East is one of the world's water and security hotspots. Its water scarcity is exacerbated by climate change and a volatile geopolitical situation, with ongoing conflicts in Iraq, Palestine, Syria and Yemen. SDC's engagement in the region involves water diplomacy interventions in close coordination with humanitarian assistance, mainly through the Blue Peace Middle East Initiative and comprehensive humanitarian assistance for water supply and sanitation in Iraq, Jordan, Lebanon, Syria and Turkey (Map 7).

**MAP 7: Middle East**



The numbers on the diagram correspond to specific locations identified on the map.

- Shared Basin or Aquifer
- Shared Basin or Aquifer with SDC focus
- Blue Peace Middle East
- Water and sanitation intervention in conflict zones
- Water Experts for Humanitarian Missions



## Blue Peace Middle East ① ② ③



The Blue Peace Middle East Initiative aims to promote and implement consensual collaborative regional solutions and concrete actions to foster sustainable water management and strengthen the broader underpinning for peace in the region.

The Blue Peace Community was created in 2011 and today constitutes a network of more than 200 opinion- and policy-makers in the Middle East. Over the past six years, a period during which the Middle East has seen violent conflicts and multiple crises of governance, it has been the only sustained mechanism for regional dialogue on water. Blue Peace is moving towards implementing concrete confidence-building water management measures that will improve general living conditions. It is also helping to establish a cooperation council for the post-conflict era. Tangible results since 2011 include:

- At a time when the Middle East has been caught up in crisis, the Blue Peace community has emerged as the only soft infrastructure for dialogue that brings together governmental, academic, technical, civil society and media representatives.
- The process has led to the creation of a political umbrella which has facilitated progress on operational projects, such as the sharing of hydrological and meteorological data and preparations for the development of a coordinated and sustainable management framework in the Orontes Basin.
- In the framework of the Blue Peace media network, more than 500 articles, media reports and television programmes have highlighted important water issues in the region.

With regard to specific actions on the ground, the initiative focuses on closing the knowledge gap by helping to gather reliable data about surface and groundwater resources and ensuring efficient water management and effective capacity building.

*“The risks and opportunities related to transboundary basins raise the question of what the international and regional community should do to prevent conflict and highlight water’s potential to reap greater collective benefits. A response to this question is becoming increasingly urgent as pressures on water resources grow. As if the age-old transboundary water management problem in the Middle East was not enough, violent newcomers on the scene are now taking hold of strategic basins such as the Euphrates-Tigris Basin. The Blue Peace Initiative has put these risks and ways of managing and resolving them in the spotlight.”*

*Ms. Marwa Osman, media leader and political analyst, Lebanon in Modern Diplomacy, June 2015<sup>17</sup>*

## Safeguarding Applied Management of Water Resources in Kurdistan (SAMoWaR)



In light of the steadily growing water demand that is exacerbated by a substantial influx of refugees, the Iraqi water sector must urgently find an appropriate response to the crisis through effective actions and recommendations. The project intends to generate and provide the required information and reliable data to improve sustainable water management in the triangular border region between Iraq, Syria and Turkey in the midst of a humanitarian crisis.

## Yarmouk River Basin ④



### Hydro-political baseline study

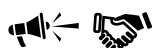
The Yarmouk River, shared by Israel, Jordan and Syria, is the largest tributary of the Jordan River. Unlike in other basins in the region, there is inadequate collective knowledge of the hydrology and politics of the Yarmouk River. The project’s objective is to provide rigorous hydrological and political analysis that will serve as a baseline for effective transboundary water resources management and hydro-diplomacy programming by Jordan, Syria and the international community.

## Water Start-Up Programme and Innovation Training for Humanitarian WASH in the Middle East



The capacity-building programme will strengthen the local capacity of water and sanitation actors, particularly with regards to humanitarian responses in Iraq, Jordan and Lebanon. This will be done through a series of trainings, innovative workshops and Arabic-language capacity development materials. Furthermore, dedicated water start-up training programmes, partly focusing on Syrian refugees in the region, will support water and sanitation entrepreneurs to market their ideas. The programme aims to increase employment opportunities and strengthen the role of the private sector in sustainable water management in the region.

## Communications and Media Training on Water



Another capacity building programme focuses on communication and media around water issues in the Middle East. It aims to sustain awareness of water-related issues among the general public and media professionals in the region. The Blue Peace media network will expand to provide a new generation of journalists, opinion makers and media professionals with the knowledge, skills and tools to communicate key aspects of water issues in the region more effectively.

## Swiss Cooperation Programme in the Middle East



Switzerland aims to save lives, reduce vulnerability and strengthen the resilience of affected populations by improving their access to basic needs. It seeks to strengthen respect for international humanitarian law (IHL) and human rights, and directs its efforts towards conflict transformation and the creation of a protective environment for vulnerable populations, including internally displaced persons (IDPs), refugees and migrants. It also aims to improve access to clean water and sanitation and to promote efficient, sustainable and conflict-sensitive water management.

Since the beginning of the Syria crisis in March 2011, Switzerland has allocated more than CHF 315 million to assist affected populations. Half of the funds have been allocated for the support of people in need in Syria itself, while the other half has gone towards supporting neighbouring countries – Iraq, Jordan, Lebanon and Turkey – in hosting refugees and vulnerable host community members.

## Syria ⑦

In Syria, the population continues to suffer from the serious consequences of incessant armed conflict and violations of human rights and IHL. They struggle to access clean water, food and basic healthcare. Over 4.6 million people in need of humanitarian aid are currently located in areas that are hard to reach or besieged and receive aid only intermittently.

Faced with the gravity of the humanitarian crisis in Syria and the region, SDC's activities are built on three pillars: providing humanitarian aid to affected communities and strengthening their resilience; helping to find a political solution to the conflict; and working to ensure compliance with international law and fighting impunity.

SDC's interventions aim to improve the situation of conflict-affected and vulnerable people according to humanitarian needs and principles. To this end, SDC is working with its partners to support the most vulnerable persons, including targeting aid to locations and persons with the greatest needs in accessible areas (e.g. areas of massive displacements) and to advocate for unimpeded humanitarian access to people in hard-to-reach and besieged locations.

## Jordan ⑤

Jordan hosts more than 2 million Palestine refugees registered with the United Nations Relief and Works Agency for Palestine Refugees. Of the Palestine refugees in Jordan, 18% live in 13 camps across the country, while the remaining 82% are integrated into Jordanian cities. In addition, Jordan currently hosts more than 650,000 Syrian refugees, which represents about 10% of the country's population.

The situation of these refugees is precarious: while 18% live in camps, the vast majority are so-called urban refugees, scattered across villages and towns, seeking shelter wherever available. Scarce resources and pressure on public services are fuelling tensions between the refugees and host communities. An estimated 80,000 asylum seekers are currently stranded at the informal north-eastern border between Jordan and Syria with extremely limited access to humanitarian aid.

In the domain of water, SDC seeks to enhance resilient, sustainable and conflict-sensitive water management. The interventions aim to increase access to safe WASH; improve water-use efficiency for food production; strengthen the basis for IWRM; and mitigate water-related disaster risks.

## Iraq ⑥

Since 2014, more than 3 million Iraqis have been displaced due to conflict, and more than 930,000 have fled to Iraqi Kurdistan. The country currently has the third-largest internally displaced population in the world.

In addition to financial support of bilateral and multilateral partners, SDC deploys experts from the SHA unit to the United Nations to strengthen the humanitarian response.

In Mosul, SDC supports partner agencies to provide safe drinking water to IDPs. In south and central Iraq, SDC supports partners focusing on WASH interventions.

# EURASIA

The Eurasian region comprises the countries of the former Soviet Union. Water security and transboundary water management in Central Asia are of geopolitical significance for the security of the five republics in the region – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan – and indirectly impact the region's neighbours Afghanistan and China (Map 8). Within SDC, projects implemented by the GPW and the Cooperation with Eastern Europe focus on Central Asia; the SHA unit supports WASH projects in the conflict zones in eastern Ukraine and on the border between Afghanistan and Pakistan; and the South Cooperation in Pakistan supports projects within the Water-Energy-Food Security Nexus.

MAP 8: Eurasia



The numbers on the diagram correspond to specific locations identified on the map.

## Blue Peace Central Asia ①



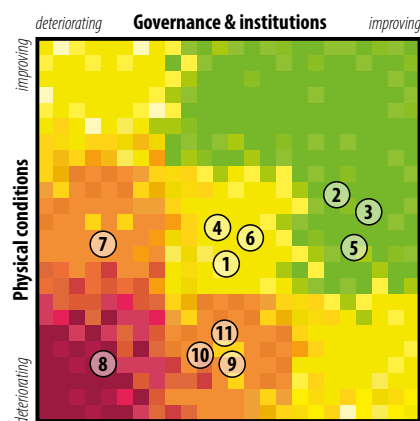
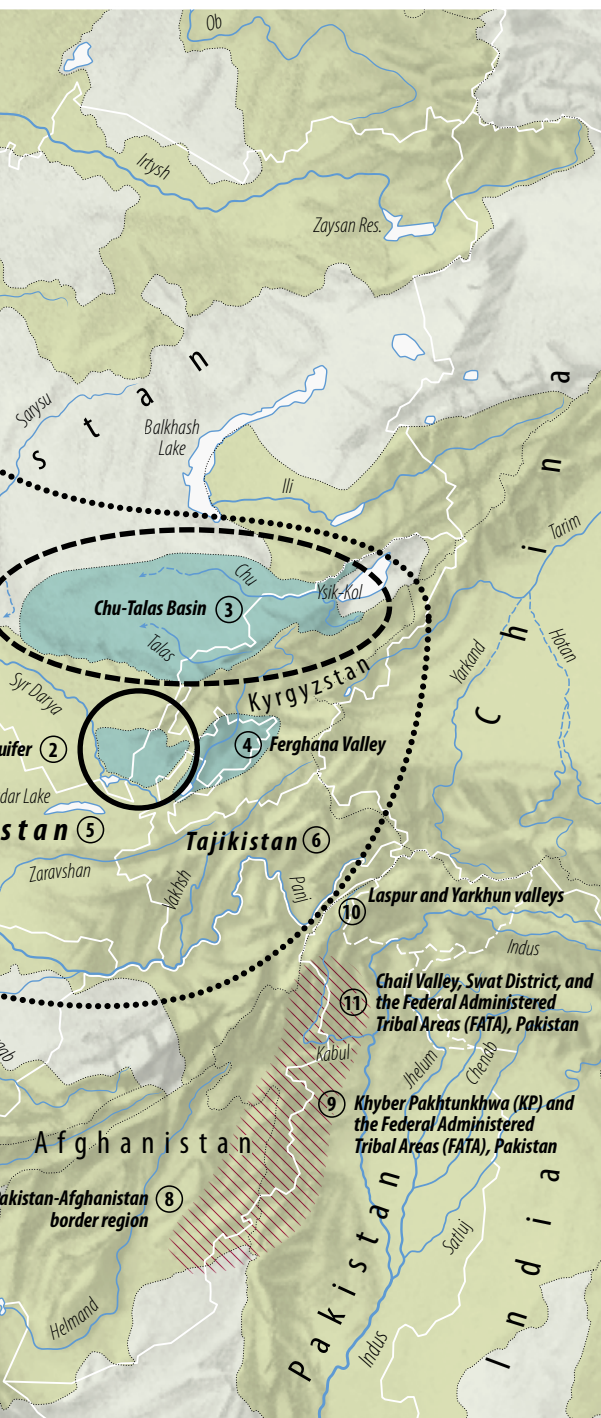
Following an initial meeting held in Basel in 2014, the high-level political dialogue of the Blue Peace Central Asia Initiative focuses on the development of a shared regional vision and concrete recommendations for shared water resources management in consultation with other regional initiatives supported by Germany, the United Nations and the World Bank. Activities on data sharing, adoption of water-quality norms and shared management of investments and infrastructure will be implemented in parallel.

## Pretashkent Aquifer ②



### Governance of groundwater resources in transboundary aquifers

The Pretashkent Aquifer is shared by Kazakhstan and Uzbekistan. The UNESCO-led initiative aims to improve knowledge of hydrogeological, socio-economic, legal and institutional aspects of managing this vital resource. UNESCO published a comprehensive assessment report in 2016, and is now following up by identifying priority issues for joint implementation.



The numbers on the diagram correspond to specific locations identified on the map.

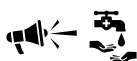
## Chu and Talas ③



### Innovative Monitoring and Modelling (iMoMo)

Kazakhstan and Kyrgyzstan share the waters of the transboundary Chu and Talas Rivers, which provide essential resources for the irrigation of vast agricultural areas in both countries, as well as opportunities for hydropower generation. The two countries signed a water management agreement in 2000, which led to the establishment of the bilateral Chu-Talas Commission in 2006. The iMoMo approach for generating, managing and exchanging data was launched in 2014. The project is aiming at introducing a modern management information system in transboundary Chu and Talas Basins to improve water accountability and transparency.

## Ferghana Valley ④ (Tajikistan, Uzbekistan)



### Rural Water Supply and Sanitation

The densely populated Ferghana Valley is a major breadbasket of Central Asia, which makes water a particularly valuable resource. A highly complex network of channels runs through the Ferghana Valley to irrigate the fertile lands of this wheat and cotton growing area. Water – an increasingly rare resource – is the cause of many cross-border conflicts. SDC is engaged in the Ferghana Valley both in Tajikistan and Uzbekistan with the Regional Rural Water Supply and Sanitation project since 2007. Due to difficulties in implementing regional projects in Central Asia, SDC decided in 2012 to develop two separate country projects with a regional view. The overall objective of the project is to improve the rural population's health and livelihood with sustainable WASH facilities as well as with the development of training for better household hygienic behaviour.

## Uzbekistan ⑤



### National Water Resources Management

Water resources management in Uzbekistan needs to be strengthened. Therefore, SDC supports the Ministry of Agriculture and Water Resources by building capacities at local and central levels, by improving the management of water-related data within the country and by supporting the establishment of strategic and legislative framework conditions for the development of the water sector. To improve the prevention of flood-related disasters and the preparedness of the authorities and the population, a pilot project is carried out on a small river shared by Kyrgyzstan and Uzbekistan.

## Tajikistan ⑥



### National Water Resources Management

The Government of Tajikistan requested SDC to address the transformation of its water resources management. A project in the north of Tajikistan strengthens the capacities of the irrigation water providers and the local communities in effective water resource management, in order to support the ongoing water sector reform process. Concurrently, the project supports the rehabilitation of key irrigation infrastructure and reduce the impact of natural disasters to sustain the achievements of the project.

## Donetsk region, Ukraine ⑦



### Improving drinking water supply and quality

In Ukraine, the SHA unit has supplied sand and chemical products to improve the drinking water supply of 3.5 million people. This assistance was linked to an appeal to the warring parties to respect the Geneva Convention on human rights regarding drinking water supply and distribution.

## Afghanistan-Pakistan ⑧ border region



### Water supply and sanitation for refugees

In the eastern districts of Pakistan, SDC provides access to drinking water to more than 50,000 Afghan refugees.

## Khyber Pakhtunkhwa (KP) ⑨ and the Federal Administered Tribal Areas (FATA), Pakistan



### Water for Livelihoods (W4L)

Pakistan has traditionally suffered from water crises going in both directions – the country either suffers from too much or too little water. Disasters like the 2010 floods destroyed millions of livelihoods in KP and the FATA, which the affected population still struggles to rebuild. SDC supports both the establishment and rehabilitation of irrigation and drinking water supply in the region, also through institutional and legal reforms. About 10,000 households have profited from each of these activities, also preventing water-related conflicts.

## Laspur and Yarkhun Valleys, ⑩ Chitral District, Pakistan



### Water and Energy Security through Microhydel

Given the rugged terrain and remoteness of many parts of Pakistan, there are still places that have no or very little electricity. SDC supports the construction of microhydel power stations in the Laspur and Yarkhun Valleys, which are not connected to the national power grid. More than 2,200 households benefit from this project, which in addition has also contributed to reducing deforestation and the degradation of natural resources as well as to creating business opportunities such as the establishment of community-based power utility companies.

## Chail Valley, Swat District, ⑪ and the Federal Administered Tribal Areas (FATA), Pakistan



### Community-based Disaster Risk Reduction

To enhance community resilience in regions of Pakistan with high disaster risks, SDC supports a community-based Disaster Risk Reduction project in the Chail valley and the FATA. Among others, the project supports a highly innovative concept providing Cash-for-Work incentives to IDPs in watershed management and disaster risk management, or the development of a disaster risk management plan for the FATA.

# SOUTHEAST ASIA

The Mekong River is one of the major transboundary rivers in Southeast Asia. Originating on the Tibetan Plateau, the river runs through China, Myanmar, Laos, Thailand, Cambodia and Vietnam. In 1995, Cambodia, Laos, Thailand and Vietnam established the Mekong River Commission for the shared management and use of the river's resources. China and Myanmar joined as dialogue partners in 1996. Switzerland has a long-standing commitment to the Mekong River Commission and its water, conflict and cooperation activities focus on supporting the BRIDGE programme on three Mekong tributaries (Map 9).

## Sekong, Sesan and Sre Pok ① ② ③



### Transboundary dialogue

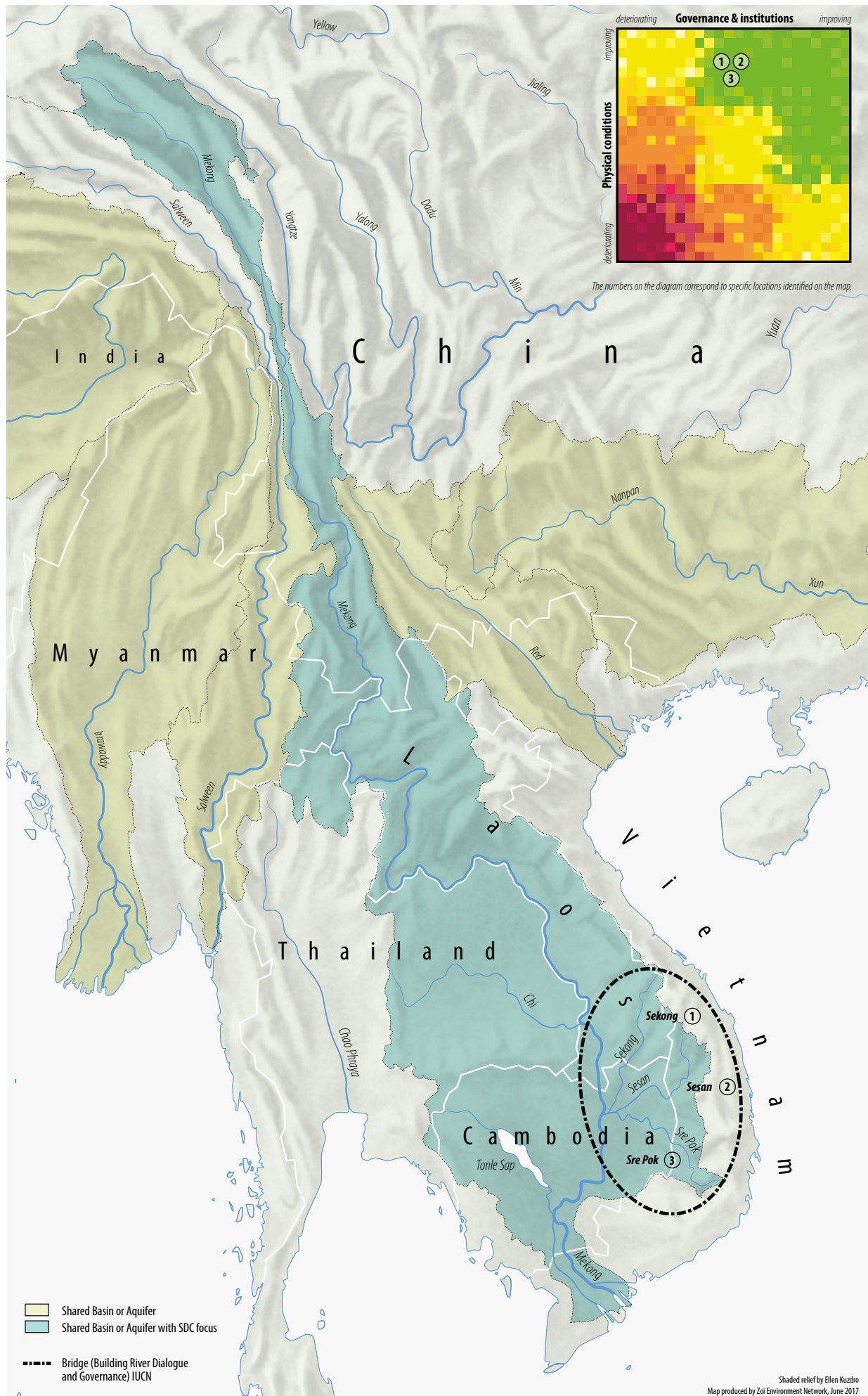
BRIDGE has helped catalyse transboundary dialogue on the three shared tributaries in the Lower Mekong region: Sekong (Cambodia, Laos, Vietnam), Sesan (Cambodia, Vietnam) and Sre Pok (Cambodia, Vietnam). The three basins sustain the livelihoods of 3.5 million people. A number of workshops on water diplomacy have been conducted and a network of national champions for water cooperation has been established. In addition, the initiative has developed a shared information platform with interactive downloadable maps. The long-term aim of the initiative is to establish sustainable institutions for transboundary water resources management. This slow, bottom-up diplomacy is being replicated elsewhere in the Mekong, and is facilitating cooperation between Myanmar and Thailand.

***“From that meeting came better understanding and a shared vision. One of the major issues that came up was that better coordination between different agencies and better mechanisms for data sharing across countries was needed.”***

---

***Tek Vannara, deputy executive director,  
NGO Forum on Cambodia<sup>18</sup>***

## MAP 9: Southeast Asia



The numbers on the diagram correspond to specific locations identified on the map.

# CENTRAL AMERICA

Few areas in Central America experience physical water scarcity, but economic scarcity, poverty and political instability limit access to water in places (Map 10). SDC interventions focus on the BRIDGE programme, with activities in four basins – Coatan, Goascaran, Sumpul and Sixaola – and on the GGRETA programme, covering the Sumpul Basin and Ocotepeque-Citalá Aquifer.

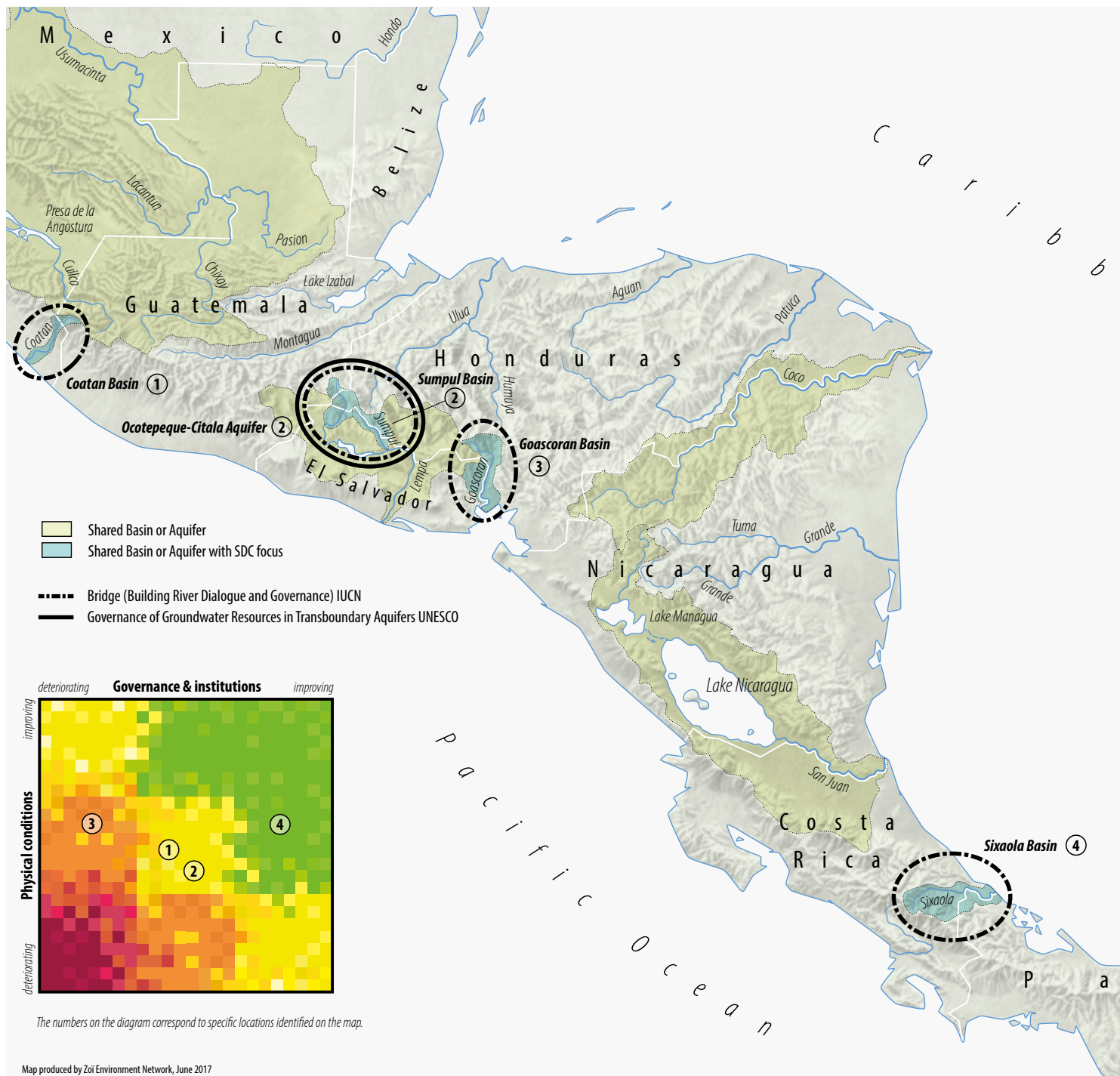
## Coatan Basin ①



### Transboundary cooperation of micro-watershed councils

The spectacular Tacaná Volcano on the Guatemala-Mexico border is the second-highest peak in Central America. Several watersheds in the border area drain to the Pacific Ocean and support small communities. BRIDGE facilitated the establishment of the Buena Vista micro-watershed committee, and exchanges between micro-watershed councils in Guatemala and Mexico enabled the implementation of action plans on both sides of the border.

MAP 10: Central America



The numbers on the diagram correspond to specific locations identified on the map.

## Ocotepeque-Citalá Aquifer ② and Sumpul Basin



### Transboundary cooperation

The Trifinio region on the border between El Salvador, Guatemala and Honduras generally has sufficient water, but only about 80% of the population is connected to a domestic water supply system. Groundwater is the main source of domestic water. Geophysical surveys of the Ocotepeque-Citalá Aquifer, which were conducted during the first phase of the GGRETA pilot project, yield unexpected results: what was assumed to be one aquifer shared by three

countries turned out to be two distinct aquifers. Only one of these, the Ocotepeque-Citalá Aquifer shared by El Salvador and Honduras, is transboundary. The project's main objective is to improve groundwater governance through multi-actor cooperation, the promotion of gender equality and the establishment of an information management system.

El Salvador and Honduras share the Sumpul River Basin, a tributary of the Rio Lempa. The main issues are related to water deficits during the dry season and floods caused by deforestation and unsustainable land-use practices in the upper reaches of the basin. The BRIDGE programme sponsored several meetings of champions. These are leaders who aim to increase cooperation in transboundary basins and promote protection and responsible management of the basins.

Jamaica

## Goascoran Basin ③



### Establishment of a binational management group

The Goascoran River is shared by El Salvador and Honduras. In general, weak institutions and minimal transboundary cooperation limit the effectiveness of the response to the main environmental problems in the basin, such as prolonged droughts, infertile soils, pollution by agrochemicals, deforestation and hunting. Under the BRIDGE initiative, the binational basin management group was strengthened through the participation of state institutions, municipal and local economic associations and NGOs. The group has set in motion a strategic plan for the development of the basin.

## Sixaola Basin ④



The Sixaola Basin, shared by Costa Rica and Panama, is known for its high biological and cultural diversity. It is home to no fewer than six protected areas and six indigenous territories. Some of the issues require transboundary attention, and BRIDGE has supported various consultations with government organizations, civil society and indigenous peoples. With the adoption of by-laws for the Sixaola Binational Watershed Commission, BRIDGE has moved the process forward so that the basin commission is now operational.

*“Since we have someone on the commission, we know what is going on. We can go to the community and tell them what the commission is doing. And we can take information from the community back to the transboundary commission.”*

*Mrs. Mitzela Dávila,  
member of the  
Champions Network*

# SOUTH AMERICA

In South America, physical water stress is mostly limited to the western Andes and southern Argentina, whereas Bolivia, Ecuador and Peru may experience economic water scarcity (Maps 1 and 11). In the Andean region, the focus of SDC's support is the BRIDGE programme in the Catamayo-Chira and Zarumilla Basins shared by Ecuador and Peru, and in the Lake Titicaca Basin between Bolivia and Peru.

## Catamayo-Chira and Zarumilla Basins ① ②



### Dialogue and data

The Zarumilla River marks part of the border between Ecuador and Peru, and, in the past, occasional changes in the river's course led to disputes between the two countries. There are also cross-river issues (as opposed to the more classical upstream-downstream scenario) related to the sharing of irrigation water.

In the Catamayo-Chira Basin, the unprecedented expansion of agriculture over the past decade has caused tensions around the sharing of irrigation water. In addition, problems related to water pollution and erosion in the upstream part of the river contribute to the sedimentation of downstream reservoirs. In 2011, Ecuador and Peru set up the IWRM Binational Commission for the Zarumilla River. In 2012, the two countries signed a joint presidential declaration calling for the establishment of binational commissions on the Catamayo-Chira and Puyango-Tumbes Basins.

In the Zarumilla Basin, BRIDGE facilitated the progress of an IWRM plan and supported the establishment of a water information system that resulted in new agreements on basin delineation. These steps in the development of the Zarumilla Commission now serve as a model for water cooperation between Ecuador and Peru.

In the Catamayo-Chira Basin, BRIDGE facilitated a series of dialogues over water cooperation, resulting in the development of a basin-wide water information system. The groundwork has also been laid for the establishment of a binational institution mandated by the presidents of the riparian countries.

## Lake Titicaca Basin ③



Pollution is one of the main issues in the Lake Titicaca Basin. One problem is erosion and sedimentation – partly related to mining – and another is pollution from the human settlements lacking sewage treatment plants. The high variation in the lake's water level creates another set of problems.

The Binational Autonomous Authority of Lake Titicaca was established in 1993. The SDC-supported BRIDGE activities focused on facilitating collaboration between the hydro-meteorological institutes of Bolivia and Peru and among the water supply companies in the basin. A water information system was developed and a plan to revise basin organization mandates was carried out.

**MAP 11: South America ►**





# OUTLOOK

*“The only alternative to water is water”.*

---

*Danilo Türk, chairman of the Global High-Level Panel on Water and Peace,  
former President of the Republic of Slovenia*

Imagine water is easily available to everyone and safe to use. Imagine it is shared equitably - benefit sharing is not just a concept but common praxis among riparian countries with plenty of successful examples. Imagine cooperation over water is axiomatic and competition over water a result of proper management leading to its protection and valuation.

This naïve but beautiful thought is swiftly destroyed when reading the daily news: Growing political tension between riparians over shared water resources; drying rivers; depleting groundwater resources; the alarming growth of the world population; uncontrolled urbanization; climate change; water stress and pollution; water competition, tensions and conflicts – an endless list.

For several years in a row, the World Economic Forum's Global Risk Reports have ranked water crises among the top global risk in terms of impact to society. It is estimated that by the year 2050, 50% of the world's population will live in water stress regions, and at least one in four of us will live in a country with chronic water scarcity. At the same time, today more than 80% of the world's wastewater is being discharged into the environment without any form of treatment.

For almost ten years, Switzerland has been engaged in water diplomacy and governance, supporting a number of programmes and initiatives of water cooperation and integrated management as displayed in this Atlas. SDC's underlying conviction is that, if countries in a given neighbourhood are actively engaged in cooperation for harnessing benefits from water resources and preserving fresh water, rather than merely allocating shares of water resources, they will also lose incentives to go to war. This has been the credo for the past years, as SDC became particularly active in the development of new mechanisms for water-policy negotiations and coordination in Africa, Asia, the Middle East and Latin America. SDC's engagement in water diplomacy relies on the long-standing experience and expertise Switzerland has gained

in transboundary water cooperation, for instance in the Rhine basin, one of the most important cultural and economic axes in Europe.

The power of water cooperation has guided Switzerland towards creating a global programme on water within its development agency. It has prompted Switzerland to develop lines of action on “water and security” to provide a compass to the work of the Swiss Federal Department of Foreign Affairs. Last but not least, in Switzerland, water, peace and security has become a top priority of the administration, supported by experts with a vast network in the field, and championed by its leaders.

Switzerland plays 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.

If we together succeed, we will look back to the year 2017 as the year in which the notion of water as an asset for peace has been turned into a widespread diplomacy mechanism. A peace mechanism that encourages forming joint water management bodies, that favours subsidiarity over sovereignty and that engages senior political leaders in the water discourse all over the world. The momentum has been created by the work of the Global High-Level Panel on Water and Peace, launched by Switzerland in November 2015. Now it is time for us to nurture our institutions, set the agendas and roll up our sleeves for a water secure world.

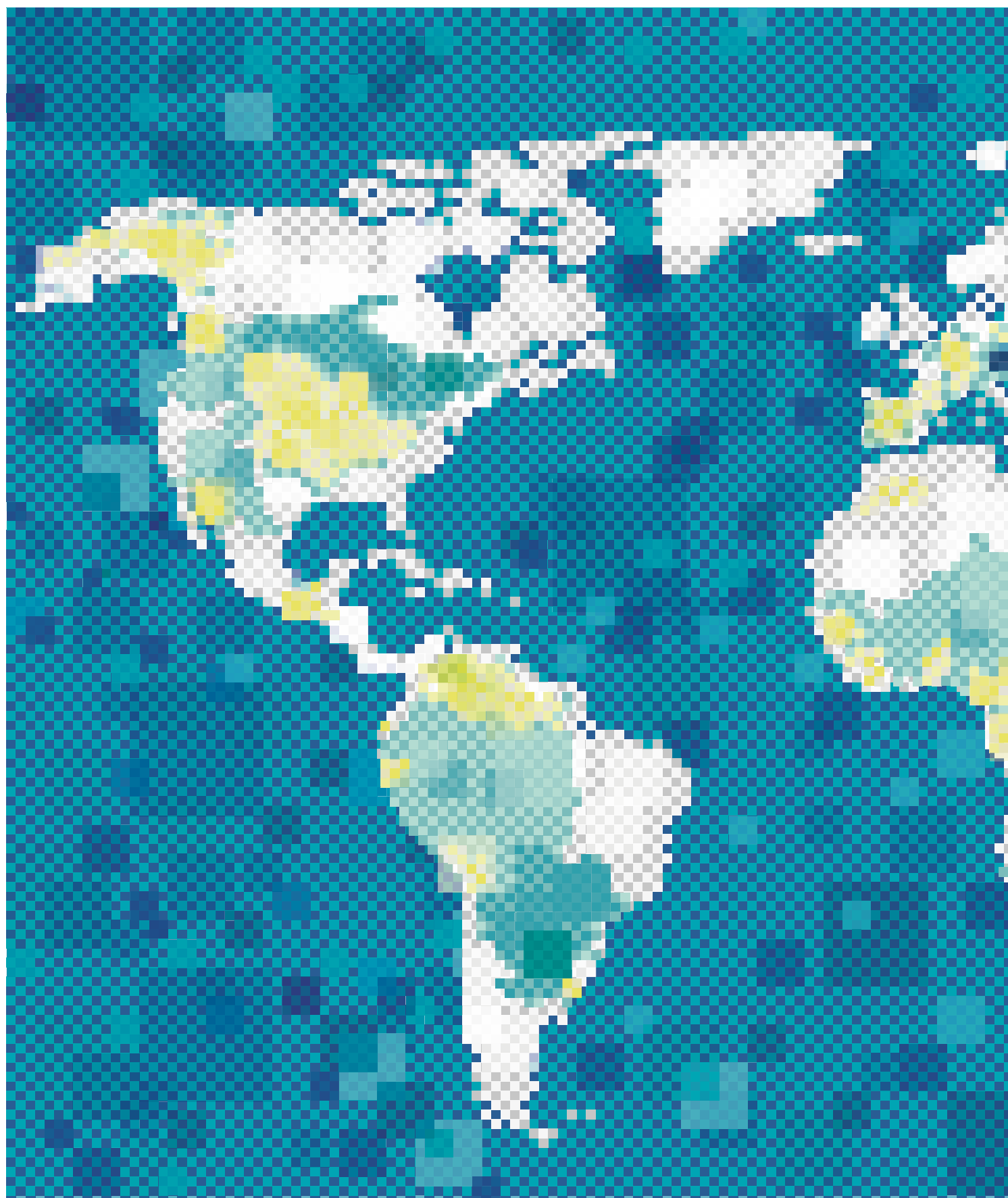
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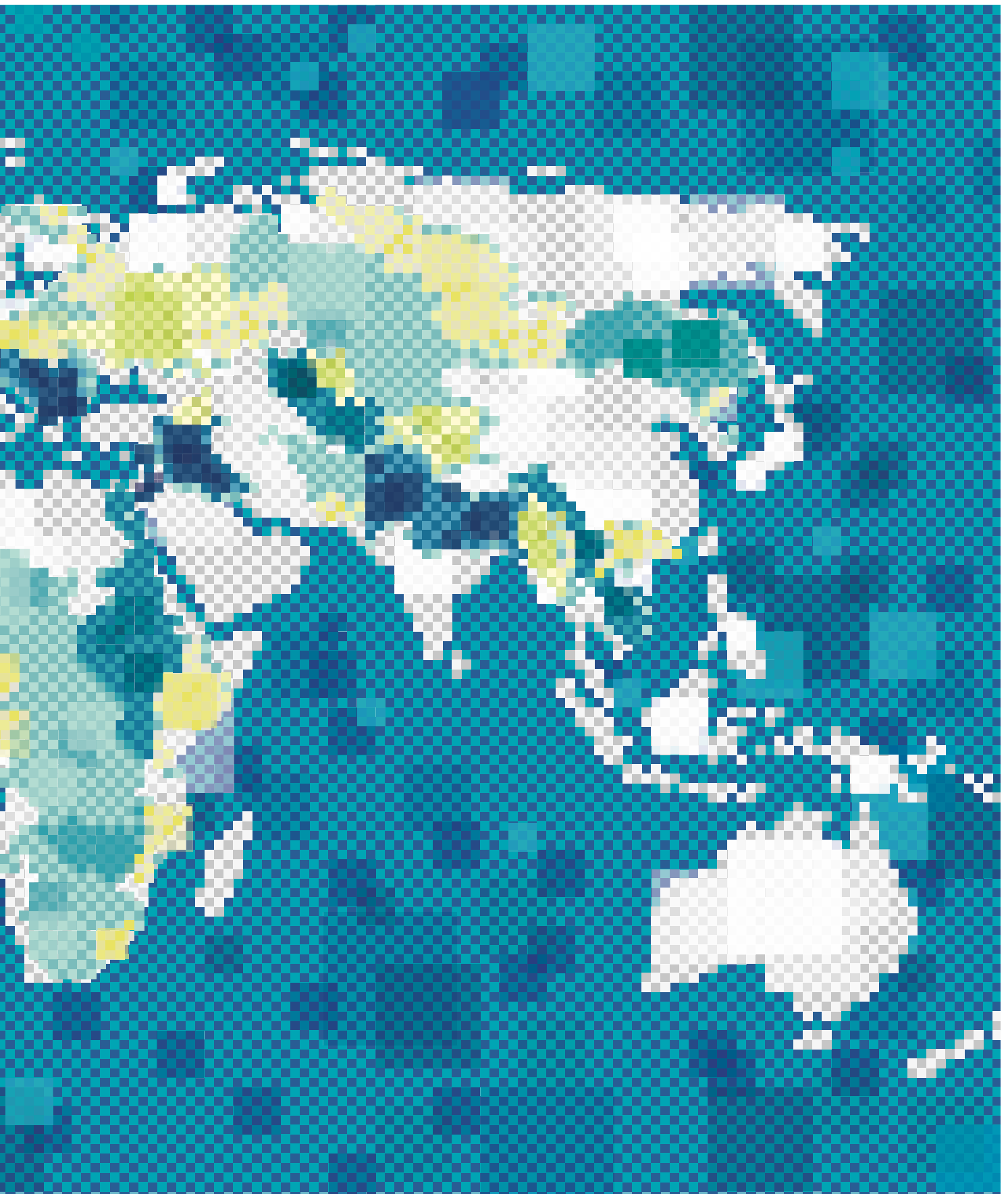
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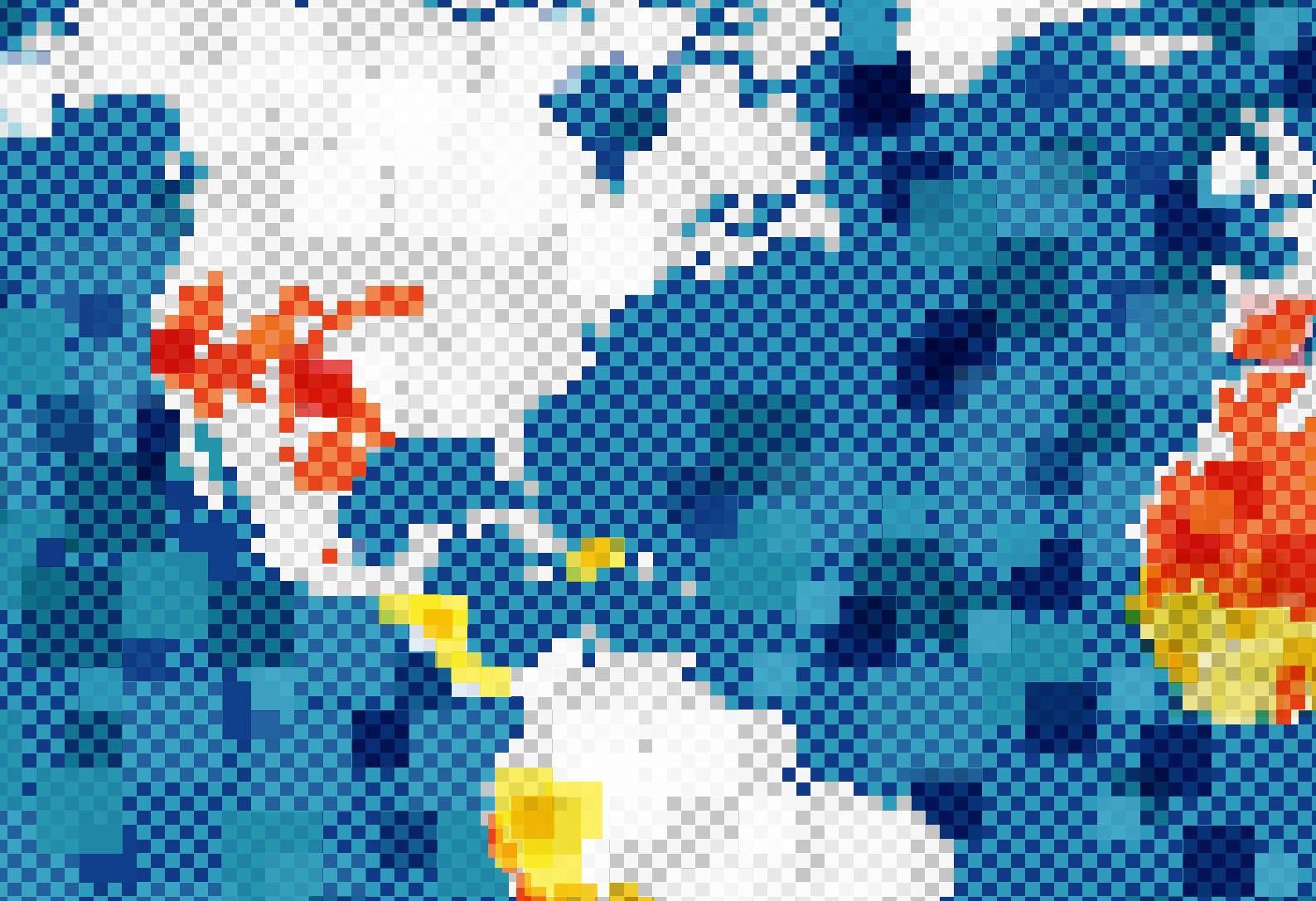
<b>BRIDGE</b>	Building River Dialogue and Governance
<b>CDE</b>	Centre for Development and Environment
<b>ESG</b>	Earth Security Group
<b>FATA</b>	Federal Administered Tribal Areas
<b>GGRETA</b>	Governance of Groundwater Resources in Transboundary Aquifers
<b>GPW</b>	Global Programme Water
<b>IDP</b>	Internally Displaced People
<b>IGAD</b>	Intergovernmental Authority on Development
<b>IHL</b>	International Humanitarian Law
<b>iMoMo</b>	Innovative Monitoring and Modelling
<b>IUCN</b>	International Union for Conservation of Nature
<b>IWRM</b>	Integrated Water Resources Management
<b>KP</b>	Khyber Pakhtunkhwa
<b>NGO</b>	Non-governmental Organization
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>SADC</b>	Southern African Development Community
<b>SDC</b>	Swiss Agency for Development and Cooperation
<b>SDG</b>	Sustainable Development Goals
<b>SHA</b>	Swiss Humanitarian Aid
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WLRC</b>	Water and Land Resource Centre
<b>WMO</b>	World Meteorological Organization
<b>WRI</b>	World Resources Institute
<b>WWF</b>	World Wildlife Fund

# FOOTNOTES

- .....
- <sup>1</sup> Addressed by John F. Kennedy before the United Nations, September 20, 1963 (source: <http://www.goodreads.com/quotes/102477-peace-is-a-daily-a-weekly-a-monthly-process-gradually>).
  - <sup>2</sup> The 2010 novel *Freedom* by the American author Jonathan Franzen vividly illustrates such conflicts.
  - <sup>3</sup> <http://waterriskfilter.panda.org/>.
  - <sup>4</sup> <http://www.wri.org/publication/aqueduct-global-maps-21>.
  - <sup>5</sup> <http://www.oecd.org/dac/conflict-fragility-resilience/>.
  - <sup>6</sup> World Economic Forum. *The Global Risks Report 2017*, 12th Edition. Geneva, 2017.
  - <sup>7</sup> Strategic Foresight Group. *Water Cooperation Quotient*. Mumbai, 2015.
  - <sup>8</sup> Wolf, Aaron T., Yoffe, Shira B. and Giordano, Mark. International waters: identifying basins at risk. In: *Water Policy* 5:1, 2003.
  - <sup>9</sup> The Earth Security Group. *Earth Security Index 2016*. Business Diplomacy for Sustainable Development. London, 2016.
  - <sup>10</sup> Adelphi Research, *The rise of hydro-diplomacy. Strengthening foreign policy for transboundary waters*. Berlin, 2014.
  - <sup>11</sup> <http://www.transboundarywaters.orst.edu/database/>.
  - <sup>12</sup> <http://www.popsoci.com/article/science/where-will-worlds-water-conflicts-erupt-infographic>.
  - <sup>13</sup> German Advisory Council on Global Change. *Climate Change as a Security Risk*. Earthscan, London and Sterling, VA, 2008.
  - <sup>14</sup> Adelphi Research. *Water and Climate Diplomacy. Integrative Approaches for Adaptive Action in Transboundary River Basins*. Berlin, 2016.
  - <sup>15</sup> World Wildlife Fund and Swiss Agency for Development and Cooperation, *The Swiss Water Footprint Report. A global picture of Swiss water dependence* [https://www.eda.admin.ch/content/dam/deza/en/documents/publikationen/Diverses/209748-wasser-fussabdruck-schweiz\\_EN.pdf](https://www.eda.admin.ch/content/dam/deza/en/documents/publikationen/Diverses/209748-wasser-fussabdruck-schweiz_EN.pdf)
  - <sup>16</sup> <http://www.un.org/sustainabledevelopment/water-and-sanitation/>.
  - <sup>17</sup> [http://moderndiplomacy.eu/index.php?option=com\\_k2&view=item&id=734:blue-peace-in-the-middle-east&Itemid=566](http://moderndiplomacy.eu/index.php?option=com_k2&view=item&id=734:blue-peace-in-the-middle-east&Itemid=566).
  - <sup>18</sup> <https://www.iucn.org/theme/water/our-work/bridge>.





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