Water crises – water opportunities

Promoting water cooperation in the Middle East

Clingendael Report

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Contents

Summary

Climate change exacerbates the pronounced water scarcity in the Middle East and also acts as a threat multiplier, for instance in the areas of health, food security and livelihoods. Increasing competition over water and the failure to address related challenges intensify tensions and conflicts within and between countries. At national level, water challenges undermine the legitimacy of the state – water provision, protection from extreme events, such as flooding and drought, and stakeholder inclusion are key elements of the social contract: if a government is unable to provide these, then the population will call into question its legitimacy. At the same time, the water crisis strains relations between countries, as two-thirds of freshwater resources in the region are transboundary and the distribution of resources is often contested. Considerable tensions between countries and the polarising and emotional nature of water as an existential resource often prevent neighbouring states from concluding water agreements. Against this backdrop, the urgency for action is high, but the scope of action for traditional transboundary water agreements is limited.

In response to this challenge, this report proposes five water-related action areas in which water cooperation is 'reimagined' and pursued via thematic entry points of national and regional interest. The report looks into established resource management frameworks, less politicised water-related challenges or topics of increasing political urgency with a strong water component – all of which are already being addressed and debated at national and local levels. By linking them with regional dialogue, capacity development and joint strategies, these thematic clusters provide promising spaces for inter-state water cooperation.

The (1) *water-energy-food-ecosystems (WEFE) nexus* could further the reuse of wastewater, better energy efficiency and the use of renewable energy at transboundary levels. Such water-related but cross-sectoral cooperation within the nexus generate shared benefits or offset disadvantages, which makes them less polarising than agreements over the distribution of water resources. Linking such efforts to bigger international debates could increase external financial and political support. The involvement of civil society and quick and visible gains from nexus projects would help to secure public support.

Regional cooperation could also be promoted on (2) *water-related ecosystems* and local livelihoods, as they play a relevant role in certain border regions. The focus on the largely undisputed goals of conservation, restoration and sustainable use of water-related ecosystems could build on sharing experiences, existing national activities and new approaches. The protection of ecosystems and biodiversity helps to protect traditional livelihoods and creates new income opportunities – in this way also easing societal tensions.

Investment in (3) *water knowledge* through better data, citizen science, public awareness, social science expertise and dissemination of traditional knowledge could also improve regional water cooperation. Citizen science can complement state efforts in the collection and analysis of data and credibly raise public awareness. This form of political participation also counteracts political disenchantment and the undermining of state structures. Social science approaches allow for a more holistic perspective on water resource management and conflict mitigation. They could play a more prominent role in regional institutions and national curricula – along with traditional knowledge and understanding of water.

In addition, (4) *transboundary, water-related disaster risk reduction* could help to jointly address shared and growing challenges such as droughts, floods, sandstorms and dust storms. To date, relevant plans, projects and supporting programmes are lacking at regional and transboundary levels. A pan-regional approach to address urgent and cyclically recurring disaster scenarios is promising, as shared benefits are evident in the event of a disaster while the costs remain manageable if the disasters do not occur. In addition, disaster risk cooperation is relatively crisis resistant, contributes to trust-building and can be implemented in several steps – from a shared warning system to damage repair, or joint planning of infrastructure to protect it against damage in the event of a disaster.

In relation to (5) *displacement, migration and reconstruction*, water cooperation could help to ensure that WASH (water, sanitation and hygiene) provision and water resource management are designed in a conflict- and climate-sensitive manner. Shared visions, jointly negotiated rules, processes and institutions can contribute to trust-building, conflict prevention and social cohesion between polarised groups or host communities and refugees – also in the context of Cash for Work (CfW) programmes. In addition, water supply is closely linked to government legitimacy and an important entry point to (re-)build social contracts

between citizens and their government. In this area it is particularly important to identify quick gains in order to illustrate the value of water cooperation to all parties.

These five action areas are not meant to be a blueprint for any setting, but an encouragement to think beyond the widespread stalemate in transboundary water governance in the region. They offer a wide range of options for strengthening state legitimacy and inclusive social contracts at national level as well as improving inter-state relations through the water sector. This less polarised, multi-level approach addresses domestic pressure to take action while embedding the latter in intergovernmental contexts and regional solutions. This report refers to examples from Iraq, Jordan, Lebanon, the Palestinian Territories and Syria, and also includes contexts in which Iran, Israel and Turkey play a role.

1 Water crises – water opportunities

The Middle East water crisis poses an existential and growing threat to the region.[1] Water is being overexploited and demand is rising, while resources are becoming ever scarcer. Climate change is accelerating negative water-related trends, such as desertification, acute water shortages and land degradation. The entire region is confronted with similar challenges in terms of quantity and quality of water for drinking supplies, industries, agriculture and maintaining ecosystems.

Reliable water supply is a basic requirement for human development and many of the Sustainable Development Goals (SDGs), including food security, health and education. Conversely, a scarce and poor-quality supply has multiple detrimental effects, such as destroying livelihoods in agriculture, tourism and manufacturing sectors, thereby driving up unemployment. Several nations are heavily dependent on agriculture for employment, as source of national income and to improve food security, but the foundations for agriculture and fisheries are increasingly disappearing, as for example, in northern Syria, southern Iraq and Jordan.

The consequences of high water consumption levels and climate change are intensifying competition over resource distribution and exacerbating tensions and conflict within and between states.[2]

At national level, water supply shortages can give rise to conflict between different users and also provoke anti-government protests, as water is a key element of the social contract.[3] State legitimacy is closely linked to the

1 We thank all our interview partners for giving us precious insights into key issues addressed in this report.

2 "Water Peace and Security Partnership", 2022.

3 The social contract is a key term in social science literature that focuses on the relationship between the state and society. It denotes the entirety of explicit or implicit agreements between all relevant societal groups and the sovereign (that is, the government or another ruler) concerning mutual rights and obligations. IDOS has refined this approach conducted related analyses in different MENA countries (see Loewe et al 2021).

responsibility to provide a reliable water supply (provision); to afford protection against extreme water events, such as flooding and drought, and against the effects of climate change (protection); and to offer water users the opportunity to represent their interests in resource management (infrastructure construction, policies, etc) and water distribution (access rights, pricing, etc) (participation). Even non-state actors and armed groups controlling territories need to gain political legitimacy here, as illustrated by efforts of the so-called Islamic State (IS) to improve water supply in the territories it had occupied.[4]

At the same time, two-thirds of the region's freshwater resources come from transboundary sources, which has led to increasing tensions related to water distribution between riparian states. For instance, disputes over Turkish dams, since these infrastructures have contributed to the reduced volume of water in the Iraqi part of the Euphrates-Tigris Basin by 30 percent over the past 40 years.[5] Combined with less rainfall, long periods of droughts and heatwaves this has had a highly detrimental impact on living conditions downstream. Conventional international water diplomacy has come to a relative standstill in several cases, even though numerous initiatives have been encouraging transboundary water cooperation over many years. Member states of the Arab League, for instance, have drafted respective policies within the Arab Ministerial Water Council.[6] Initiatives for promoting transboundary water agreements have received backing from European states.[7] Sweden, in cooperation with the United Nations Economic and Social Commission for Western Asia (UN-ESCWA) and the United Nations Economic Commission for Europe (UNECE), supported transboundary water governance in preparation for the adoption of the UNECE Water Convention[8] (e.g. in Tunisia, Jordan and Iraq). Nonetheless, such initiatives have only had limited success in the Middle East; there are very few agreements, river basin commissions, etc that address water in a sustainable and comprehensive manner at regional level. More recently, a new approach for the development

4 Tobias von Lossow, Weaponizing Water in the Middle East: 'Lessons Learned' from IS, in M. King (ed.), Water and Conflict in the Middle East, Hurst 2020, pp. 151-170.

5 Tobias von Lossow, "More than infrastructures: water challenges in Iraq", Clingendael & PSI, 2018.

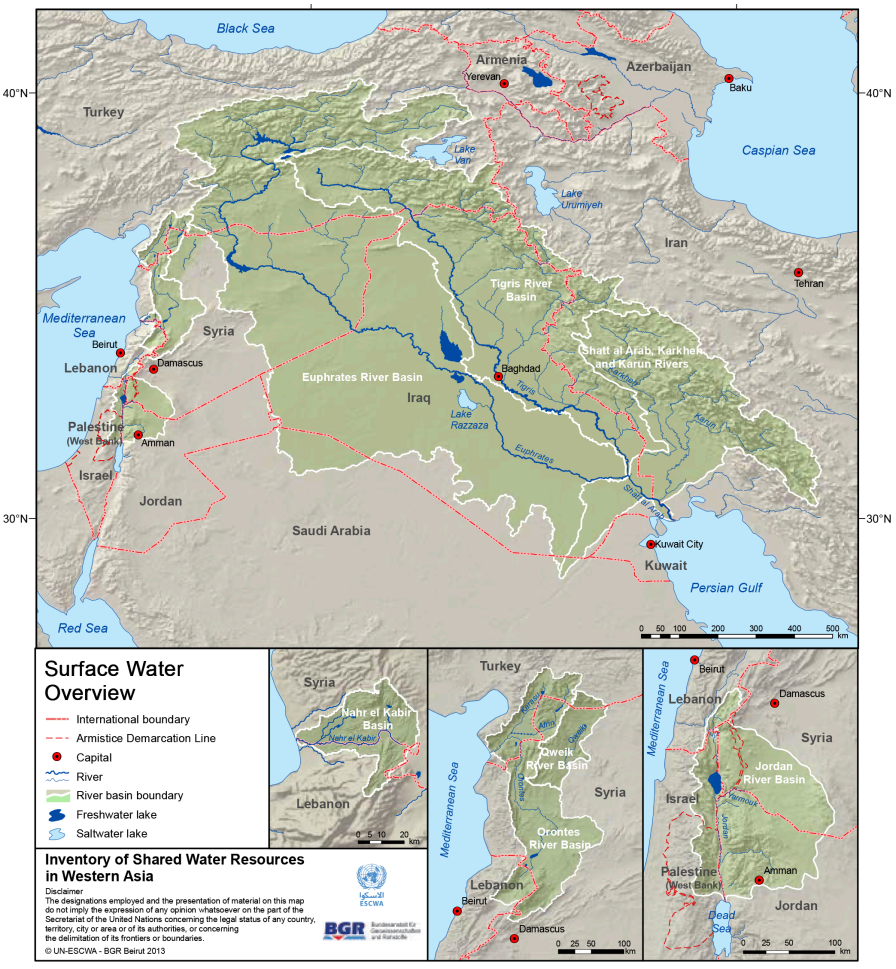
6 Arab Water Council, "Home", n.d.

7 International Center for Biosaline Agriculture, "Collaborative Programme Euphrates and Tigris (CPET)", 2015.

8 United Nations Economic and Social Commission for Western Asia (UN-ESCWA), "Workshop on Enhancing transboundary water cooperation in the MENA region", 2020a.

of transboundary, multisectoral joint investment plans within the Blue Peace[9] initiative promotes trust building through water cooperation in the region.

Map of shared surface water basins in Western Asia[10]



Source: Compiled by ESCWA-BGR.

9 "Blue Peace", n.d.

10 UN-ESCWA and Federal Institute for Geosciences and Natural Resources (BGR), "Inventory of Shared Water Resources in Western Asia", 2013.

The (regional) political potency and relevance of water scarcity is evident: water is a source of state power and closely linked to national security as it is a regional challenge that has an impact on inter-state relations. The dire water situation clearly shows that there is a great and acute need to take action. But considerable tensions between the countries in the region and complex geostrategic implications of water issues affecting, for example, Iran, Saudi Arabia, Russia, Turkey and the US as well as the Kurdish regions and the Palestinian Territories, obstruct transboundary cooperation. In spite of increased data availability, the highly polarised nature of water distribution within states as well as at intergovernmental level further complicate the conclusion of water agreements.[11]

While climate change causes or exacerbates the common water challenges, it can also provide an impetus for less politically sensitive entry points for regional water cooperation. Climate change can help to move things beyond traditional narratives and blame games in the water sector; combined with the pressure to act, it provides a window of opportunity for new water-related initiatives and alliances. International awareness of the Paris Agreement and implementation of the SDGs brings new financing options for environmental and water-related projects. Together with the repercussions of Russia's invasion of Ukraine on food security and thus water use, this increases the pressure to take action.

Water cooperation is necessary to address the enormous challenges in the region, but traditional intergovernmental water agreements are politically complex and, in many cases, not very promising. This study presents an alternative approach to boost inter-state water cooperation in the region and, in some cases, to overcome deadlock situations in transboundary water conflicts and negotiations. Looking into five prominent water-related action areas being addressed and debated at national and local levels uncovers entry points for inter-state cooperation. These action areas allow water cooperation to be reimagined and pursued via thematic entry points of both national and regional interests. This places emphasis on individual and shared benefits for the countries from measures implemented in a multi-level approach: at local level

11 This impression was confirmed time and again during the interviews conducted for this study with local organisations and with representatives of German implementing organisations with regional experience in the water sector.

(sometimes in border regions), at national level (not least in dialogue with other states in the region) and at regional level.

All areas offer opportunities to address local and national problems at the same time and contain possibilities for transboundary dialogue and activities. Even in places where the transboundary nature of a challenge is not obvious, regional exchange and cooperation can help to more effectively address local, national and regional trends, such as rising demands for water. This approach allows to develop transboundary agreements on tackling common challenges, such as water-related disasters. Regional experience-sharing and capacity development promote intergovernmental dialogue and strengthen mutual trust. In turn, improvements in water management at national level may help to alleviate pressure in transboundary water conflicts.

2 Regional water cooperation in action areas

Water challenges are being addressed in many ways and various contexts, which include established resource management frameworks, less politicised challenges and topics of increasing political urgency. The five action areas for regional water cooperation in this analysis are being prominently addressed and debated at national and local levels: (1) the water-energy-food-ecosystems (WEFE) nexus; (2) water-related ecosystems; (3) water knowledge through data collection, citizen science, awareness raising and social science expertise; (4) water-related disaster risk management at transboundary level; and (5) water cooperation in the context of displacement, migration and reconstruction. All of these thematic clusters can be used to support cooperation between different, frequently competing, population groups, sectors and neighbouring states. In this way, related measures also address the safeguarding of livelihoods and incomes – positively impacting peace and stability as well as strengthening state legitimacy and inclusive social contracts.

While some measures explicitly include transboundary elements, others would benefit from more local and national activities. These activities could be carried out at the same time in several countries and border regions in order to extend their reach to neighbouring countries and to possibly culminate in the long term in regional initiatives and agreements. Regional approaches can serve to build confidence and safeguard thematic dialogue at political and/or implementation level and in civil society. In this way, established communication channels help to maintain relations in the event of tensions.

Given the volatile security situation in some areas and frequent changes in political constellations in others, the proposed measures seek to apply a ‘no-regret’ and ‘do-no-harm’ approach to more inclusive and sustainable water resource management and supply. This study focuses on Iraq, Jordan, Lebanon, the Palestinian Territories and Syria, with consideration also given to Iran, Israel and Turkey where relevant. However, the paper is primarily thematic in nature and touches upon relevant examples and case studies for illustrative purposes.

2.1 Moving towards win-win at the nexus of water, energy, food and ecosystems (WEFE nexus)

Water supply, energy generation and food production are closely linked and all depend on functioning ecosystems. Because of these links between sectors, holistic approaches are needed to govern inevitable trade-offs, but also provide opportunities for win-win solutions. Local or national nexus projects to increase water-use efficiency can indirectly improve water availability in neighbouring states. Between states, better water-flow management and joint electricity generation, for instance, are less polarising than negotiations over water allocation and can potentially boost transboundary cooperation. A prominent agreement was signed in 2020: investments from the United Arab Emirates finance a desalination plant in Israel to supply water to Jordan, and a solar plant in Jordan to export electricity to Israel.[12]

Most promising opportunities for nexus projects at both national and international levels function through benefit-sharing mechanisms, either by generating shared benefits or by offsetting disadvantages.[13] Both financial and political support for nexus projects may increase when they are linked to the Nationally Determined Contributions (NDCs) for implementation of the Paris Agreement, the SDG agenda[14] or green growth strategies. At national and transboundary levels, donors may also support the improvement of legal and political frameworks to address environmental and social issues that may arise (i.e. renewable energies, land and water rights). Early involvement of civil society combined with quick and visible gains from nexus projects, such as employment or improved living conditions (e.g. climate resilient water, food or energy supply[15]), help to secure public support for new initiatives.

12 Reuters, "Israel and Jordan move forward with water-for-energy deal", November 2022.

13 For benefit-sharing in dam projects on transboundary rivers see Oliver Hensengerth, Ines Dombrowsky, Waltina Scheumann, "Benefit-sharing in dam projects on shared rivers", German Development Institute, 2012.

14 Arab Water Council, "The Climate Risk Nexus Initiative", n.d.

15 Rabi H. Mohtar, Amjad T. Assi, Bassel T. Daher, "Water Security in a Challenging World: Water-Energy-Food Security Nexus in the Arab Region", 2015.

Nexus projects should be implemented within established institutions[16] working at cross-sectoral level, such as those in Jordan. It is also advisable to start at local level, as intersectoral cooperation at national level is complex and linked to a strong political economy and opposing power interests.

Regional nexus projects can, for instance, pool resources and facilitate benefit-sharing through the reuse of wastewater for irrigation and building on existing water treatment plants in several countries. Similarly, nexus projects could support greater energy efficiency of water utilities, including the use of renewables, as well as joint or jointly operated nexus-relevant infrastructure for transboundary water provision. In (post-)conflict regions or those challenged by a high influx of refugees or migrants, nexus approaches can help boost resilience through gains in resource efficiency (including treating and reusing wastewater for WASH or irrigation needs).

This is highly relevant in the context of food crises with regard to irrigation for increasing domestic production of basic foodstuffs and making countries more independent of volatile and highly inflated global market prices. However, potential rebound effects need to be prevented: for instance, instead of maintaining reservoir levels, water savings were frequently reinvested in water-intensive crops and expanded irrigation areas. Nexus activities should thus be combined with measures for conserving water-dependent ecosystems.

Nexus projects support energy efficiency in water treatment plants and the reuse of wastewater for agriculture within several countries, and at transboundary level, as in the case of Syria-Lebanon.[17] Many of these projects are technically focused capacity-development initiatives in the water and energy sectors implemented by regional organisations such as the Arab Water Council and UN-ESCWA. Expanding such approaches would be useful to better include civil society and local communities,[18] but also water utilities, for instance via the regional office of the United Nations Human Settlements Programme (UN-Habitat)/Global Water Operators' Partnerships Alliance (GWOPA)[19].

16 Elie Chnais, Nadim Farajalla, Rana El Hajj, "Water, Energy, Food Nexus: An Outlook on Public Institutions in the Arab World", AUB Policy Institute, 2016.

17 United States Agency for International Development (USAID), "Water Supply and Wastewater Systems Master Plan for the Bekaa Water Establishment", May 2015.

18 Arab Water Council, "Public Engagement in Water Management", n.d.

19 Global Water Operators' Partnerships Alliance, "MENA Region", n.d.

Also, the consequent inclusion of Turkey as an important player in this context provides for more scope of action; its Memorandum of Understanding with Iraq in 2021[20] on nexus interests has been more of an exception. Important regional players on the WEFE nexus include the Arab Water Council,[21] the Middle East Desalination Research Center (MEDRC), the Union for the Mediterranean (UfM[22]), projects implemented by UN-ESCWA, the Food and Agriculture Organization of the United Nations (FAO) and the World Bank, and bilateral initiatives, including those involving the United States.

Such initiatives need to be multiplied wherever win-win opportunities between sectors and/or countries emerge, and their sustainability enhanced through the abovementioned regional support. Last but not least, transboundary nexus initiatives in the region need more scientific evidence on the best modalities for planning and implementation,[23] and on their confidence-building and conflict-prevention effects. The latter are often presumed but causal chains and best practices have not been sufficiently researched yet.

2.2 Strengthening water-related ecosystems

Ecosystems and biodiversity provide livelihoods through such services as water filtration and purification, or giving a home to flora and fauna. The largely arid and semi-arid Middle East hosts less water-related ecosystems than regions with high precipitation levels, which makes the population all the more reliant on its few river systems, wetlands and groundwater-fed oases. Climate change and persistent overexploitation by humans contribute significantly to ecosystem damage,[24] with many social, economic and environmental repercussions. Some of these are mutually reinforcing, such as declining agricultural yields posing a risk to livelihoods and incomes, and fuelling unrest

20 Iraqi News Agency, "Iraq announces activating water agreement with Turkey", October 2021.
21 Arab Water Council, "Arab Non-Conventional Water Resources Initiative", n.d.
22 Arab Integrated Water Resources Management Network (AWARENET), "Home", n.d.
23 For example, the pipeline from the Sea of Galilee to Jordan (Jordan-Israel), the Bekaa Water Establishment (Lebanon – Syria), and the activities of EcoPeace (Jordan, Israel, Gaza).
24 Eduardo S. Brondizio, Josef Settele, Sandra Díaz & Hien T. Ngo, "Global Assessment Report on Biodiversity and Ecosystem Services", IPBES, 2019.

and anti-government protests, as seen in Iraq in 2018[25] and Lebanon in 2019.[26] Damaged and dysfunctional ecosystems also intensify regional megatrends such as urbanisation and migration. Spoiled and abandoned land, in turn, accelerates desertification in rural areas.

Next to major transboundary river basins in the region (Jordan, Orontes and Euphrates-Tigris), there are smaller, somewhat lesser known but relevant ecosystems that significantly shape the identities and livelihoods of the local population. Despite some of them having been on the brink of collapse, they often receive less attention, for example the Marshes of southern Iraq (which stretch geographically into Iran), the Azraq Basin in Jordan (impacting the region bordering Syria) and the Aammiq Wetland close to Lebanon's border with Jordan.

After Saddam Hussein drained the Iraqi Marshes in the 1990s in retaliation for an uprising against his regime, local civil society initiatives[27] drew on international support to restore and maintain around half of this unique ecosystem in the early 2000s. Nevertheless, the ecosystem has continuously been facing threats, such as declining water levels in the Euphrates and Tigris, the impact of climate change or the weaponisation of water by the so-called Islamic State (IS).[28] Consecutive years of severe drought and temperatures regularly exceeding 50 degrees Celsius have left large parts of the Marshes parched and dusty during the summer, threatening the livelihoods of the Marsh Arabs that live from agriculture and fishing.[29] The water resources of Jordan's Azraq Basin have been significantly overexploited over decades, which stirred distribution conflicts. Deficient water treatment in the highly industrialised Zarqa governorate has led to environmental damage and health issues. Despite water being pumped into the region since the 1990s, only 10 percent of the original oasis is left and water resources continue to decline. The Aammiq Wetland on the Bekaa plain in Lebanon is an important conservation area for migratory birds. Since the mid-1990s protecting the area has been on the national agenda, involving

25 Human Rights Watch, "Irak: Wasserkrise in Basra", July 2019.
26 Amnesty International, "Die Libanon-Proteste erklärt", January 2020.
27 Nature Iraq, "Nature Iraq: Protect, Restore and Preserve the Environment", n.d.
28 Tobias von Lossow (2016), The Rebirth of Water as a Weapon: IS in Syria and Iraq, The International Spectator, 51:3/2016, pp. 82-99.
29 Sinan Mahmoud, "Iraq's ancient marshlands drying up again as activists plead for water", The National News, October 2022.

the Lebanese branch of A Rocha,[30] an environmental conservation non-governmental organisation (NGO). Today, the wetland is relatively well protected – it has also been on relevant conservation lists, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) list of Biosphere Reserves (since 2005), the list of Ramsar sites (1999) and the International Union for Conservation of Nature (IUCN) directory of wetlands in the Middle East (1995).

Water-related ecosystems are key levers for water filtering and storage functions, thereby protecting soil fertility, biodiversity and livelihoods, and simultaneously increasing resilience against climate change. Interventions can address issues at local level and the wider surroundings of the ecosystems but can also be implemented across borders. Regional cooperation could support the conservation, restoration and sustainable use of water-related ecosystems and promote sharing of experiences between respective nations. Cooperation could build on existing national activities and mobilise new approaches, such as citizen participation for ecosystem protection or scenario analyses of groundwater use. In addition to protecting ecosystems and biodiversity, such interventions help to protect traditional livelihoods while creating new income opportunities, for example by promoting sustainable tourism, and thus easing societal tensions.

The Jordan River and the Dead Sea, one of the region's largest ecosystems, has attracted numerous initiatives and transboundary projects, including the EcoPeace Middle East plan for the Jordan Valley[31] and the controversial Red Sea-Dead Sea Canal.[32] Initiatives along the Euphrates and the Tigris, which have had only moderate success to date, also feed implicitly into the conservation of the ecosystem. At regional level, there are only a few programmes and initiatives related to ecosystems, such as the Saudi Green Initiative[33] and EcoPeace Middle East.[34] But the Ramsar Convention on Wetlands of International Importance

30 A Rocha Lebanon, "Previous Projects: Conservation in the Aammiq Wetland", 2015.

31 EcoPeace Middle East, Regional NGO Master Plan for Sustainable Development in the Jordan Valley, https://ecopeaceme.org/wp-content/uploads/2022/03/Regional_NGO_Master_Plan_Final.pdf, 2015.

32 Almut Weis, "Questions and Answers to the Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank", Global Nature Fund, n.d.

33 Mariam Nihal, "Saudi Green Initiative: all you need to know about Kingdom's net-zero plan", April 2021.

34 See EcoPeace Middle East, https://ecopeaceme.org/, n.d.

Especially as Waterfowl Habitat could serve as a framework in this regard, having provided the basis for adding the Iraqi Marshes (al-Ahwar) to the UNESCO World Heritage List[35] in 2016. The potential of such international initiatives to encourage transboundary cooperation has also been underscored in regional water dialogues within the UN-ESCWA.[36]

Ecosystem conservation could be institutionally mainstreamed at local, national and regional levels, for instance, through the Center for Restoration of Iraqi Marshes and Wetlands[37] in Iraq, A Rocha in Lebanon or the IUCN.[38] This could involve government agencies as well as non-state initiatives in the environmental, climate and water sectors; international donors might also support local initiatives in many cases, such as seen in Iraq[39] or Jordan.[40]

2.3 Improving water knowledge through data collection, citizen science, awareness raising and social science expertise

Water provision and protection against resource degradation or extreme water events play a key role in the social contract; a properly functioning water supply can strengthen government legitimacy, especially in fragile settings. However, measures need to be based on reliable data such as the volume and quality of water and access to it. In addition, public access to environmental information, such as water quality, plays a key role in environmental governance[41] as it allows civil society to claim state functions and develop solutions.

However, in many countries (local) authorities lack sufficient capacity, armed conflict renders relevant regions inaccessible, or data collected is not communicated frequently and thus hinders cooperation between sectors

35 UNESCO World Heritage Centre, "The Ahwar of Southern Iraq: Refuge of Biodiversity and the Relict Landscape of the Mesopotamian Cities", n.d.

36 UN-ESCWA, "Report of the regional workshop. Enhancing transboundary water cooperation in the MENA region – progress, challenges and opportunities", 2020.

37 Center for Restoration of Iraq Marshes & wetlands, "Home", n.d.

38 International Union for Conservation of Nature (IUCN), "Regions", n.d.

39 Eden in Iraq, "Home", n.d.

40 WADI Jordan, "About us", January 2023.

41 Annabelle Houdret, Irene Pasqua & Saâd Filali Meknassi, "Access to environmental information: a driver of accountable governance in Morocco and Tunisia?", 2018.

and states.[42] For groundwater, fluctuations in volume and quality are often 'invisible' and thus not considered a priority. It is therefore necessary to improve institutional capacities to record, analyse, manage and share water-related data. A regional approach is particularly advisable for groundwater, such as in UN-ESCWA's related database.

Citizen science has been proved to be highly efficient in complementing state efforts in the collection and analysis of environmental data and design of related research and awareness raising.[43] It can involve training courses, cooperation with researchers or local water institutions as well as the latest sensor technology, data processing and visualisation.[44] Civil society organisations, academia, journalists and citizens can help to collect and communicate key environmental data: they can record water quality[45] at consumer locations, in coastal areas,[46] lakes and rivers, and they can document pollution, land degradation, coastal erosion and biodiversity loss. This information would supplement data collected by the state and be used to effectively and more credibly raise public awareness of the water situation, resources distribution, related problems such as pollution, and options for action. In Lebanon,[47] for instance, higher-education institutions are researching this potential in the water sector and are implementing projects.

Citizen science can be carried out in the common interest and in cooperation with local institutions. It facilitates a form of political participation, for example if collected data informs local or national political decision-making processes, which in turn counteracts political disenchantment and the undermining of state structures. It can also work in remote, rural or conflict-prone areas and can deliver important information from these often neglected areas when citizens

42 UN-ESCWA, "Report of the regional workshop. Enhancing transboundary water cooperation in the MENA region – progress, challenges and opportunities", 2020.

43 Alex De Sherbinin, Anne Bowser, Tyng-Ruey Chuang, Caren Cooper, Finn Danielsen, Rorie Edmunds, Peter Elias, et al. "The Critical Importance of Citizen Science Data", Frontiers in Climate 3, 2021.

44 Wouter Buytaert, Zed Zulkafli, Sam Grainger, Luis M. Acosta, Tilashwork C. Alemie, Johan Bastiaensen, Bert De Bièvre, et al. "Citizen Science in Hydrology and Water Resources: Opportunities for Knowledge Generation, Ecosystem Service Management, and Sustainable Development", Frontiers in Earth Science 2, (2014).

45 Anemone Project, "Home", n.d.

46 Ted Fickes, "Secret Agents power citizen science, help protect Lebanese coast", MOBLAB, 2012.

47 American University of Beirut, "Citizen Science", n.d.

are adequately trained and technically equipped (e.g. using smartphones). In (post-)conflict contexts, such approaches have already been employed, for instance, to monitor disarmament, destroyed infrastructure, or environmental damage resulting from armed conflict (for example, in Syria[48]) or to facilitate virtual reconstruction of cultural monuments.[49]

Citizen science can be implemented at local, national and even transboundary levels. If data is generated at the same time in border areas of two countries on a common challenge, such as water pollution, this could aid the elaboration of joint solutions. However, citizen protection is critical here, since electronically transmitted data could be misused for political monitoring or falsified intentionally to create disinformation. In Iraq, for instance, several environmental activists have been intimidated, severely threatened or even kidnapped.[50]

In Jordan and the Palestinian Territories, potentially in cooperation with Israel, citizen science could build on the activities of EcoPeace Middle East, including at municipal level. In a larger regional association, the Arab Countries Water Utilities Association (ACWUA) has worked with the Global Water Partnership (GWP) to fund knowledge projects.[51] There is scope in Lebanon and Jordan to forge links with regional programmes for strengthening water utilities in regions that are in crisis and which host refugees, such as ACWUA programmes[52] and others.

Awareness and knowledge of the socioeconomic impact of water scarcity, water distribution, climate change and resource management, as well as the incorporation of cultural and religious values, all help to mitigate conflict potential and heighten a sense of responsibility on the part of all stakeholders.

48 Conflict and Environment Observatory, "Using citizen science to assess environmental damage in the Syrian conflict", 2016.

49 Jamie Locke-Jones, "Curious Travellers: rebuilding the past through citizen science", University of St Andrews, 2021.

50 MEMO Middle East Monitor, "Prominent Iraq environmental activist kidnapped near Baghdad", February 2023.

51 Overview ENTIRE project, https://www.hidropolitikakademi.org/en/event/10538/empowering-civil-society-in-water-management, n.d.; see also UN-Habitat's Global Water Operators' Partnerships Alliance (GWOPA), "1st GWOPA Expert Group Meeting 'Water and Sanitation Utilities in water scarce cities in the MENA region'", June 2020.

52 See for example European External Action Service (EEAS), "Promoting Sustainable Management of Water Services and Resources in Countries affected by the Syrian Crisis", March 2020.

Social science approaches allow for a more holistic perspective on water resource management, including socio-political and economic implications and the potential of non-state actors. Examples from other countries, for instance Morocco, show how NGOs in the WASH and irrigation provision sectors can offset state deficits and establish a new relationship at local level between the state and society.[53] Regional institutions and national curricula should be supported to include social science approaches and knowledge next to technical and economic knowledge. In addition, traditional technical, scientific and socio-cultural understanding of water could also be strengthened; from rediscovering traditional irrigation methods (including Qanat and Khettara) and their significance against the backdrop of climate change, to understanding the religious and cultural meaning of water (important for awareness-raising initiatives) and traditional governance mechanisms. Based on existing knowledge about social water studies in the Arab region,[54] teaching, research and network activities could be further extended. Regional institutions such as UN-ESCWA could help strengthening social science capacities in subordinate agencies of its member states in the water, agricultural, environmental or urban construction sectors.

2.4 Scaling up water-related disaster risk reduction and management to regional level

The deterioration of the climate and water situation in the region increasingly brings with it water-related disasters. Since 2000, climate-related disasters have caused an average of USD 2 billion in property damage, adversely affected seven million people and claimed 2,600 lives each year.[55] Climate change will continue to intensify such trends, especially in areas with low resilience, including high dependence on rain-fed agriculture, which are at the same time vulnerable to conflict. Responding to water-related disasters which do not stop at district

53 Annabelle Houdret, "How Can Water Sector Cooperation Support Democratic Governance? Insights from Morocco, Middle East Law and Governance", 13 no1, (2021), 72-97.

54 Manar Fayyad, Serena Sandri, Matthias Weiter & Dimitrios Zikos, "Social Water Studies in the Arab Region", Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), German Jordanian University (GJU) and Humboldt-Universität zu Berlin, 2015.

55 Cristoph Duenwald, Yasser Abdih, Kerstin Gerling, Vahram Stepanyan, Lamiae Agoumi, Abdullah AlHassan, Gareth Anderson, et al. Feeling the Heat: Adapting to Climate Change in the Middle East and Central Asia, Departmental Papers, 008, (2022).

or country borders (e.g. flooding in the wake of heavy rainfall) is a regional key challenge[56] that needs to be tackled not only at local and national levels, but also at regional level. While national borders and water distribution continue to play a role in case of disasters, cooperation can bring win-win situations in the wake of sandstorms and dust storms, flash floods or heatwaves. Regional cooperation in water-related disaster risk management can be developed most effectively for specific topics, based on scenarios. A cooperation arrangement could focus on existing, urgent, cyclically recurring and transboundary disaster scenarios in particular regions and countries. At the same time, it is possible to share experiences and thus broaden regional cooperation between all states and regions facing similar challenges. This also concerns neighbouring countries including Egypt, Iran, Israel, Saudi Arabia and Turkey.

To date, relevant plans, projects and supporting programmes[57] are found at UN, national or municipal level, as in the case of the flooding in Gaza,[58] but there is a lack of regional and transboundary action plans. Compared to other areas, a pan-regional approach is particularly promising, as it is more likely to be supported by the countries. On the one hand, shared benefits in the event of a disaster are highly evident and, on the other hand, the costs of such cooperation would be manageable if and where the disasters do not to occur. Investments in this area have a long-term impact and are relatively crisis resistant. Beyond the direct benefit in the event of a disaster, such measures also serve to build trust, which could promote or reinvigorate willingness to cooperate in other, more contested areas in the medium to long term. The numerous extreme weather events of recent years and the intensified climate change debate have created momentum that could facilitate such kind of regional cooperation. As a first step, programmes to boost the coherence of national efforts,[59] increase awareness of the issues or encourage regional mainstreaming[60] could serve as an entry point. Disaster risk cooperation can be integrated with other projects, for instance in the areas of climate change, land degradation or desertification.

56 World Bank, "Natural Disasters in the Middle East and North Africa: A Regional Overview", 2014.

57 USAID, "Development & Disaster Risk Reduction Middle East, North Africa, & Europe", 2020.

58 Global Facility for Disaster Reduction and Recovery (GFDRR), "Strengthening the resiliency and sustainability of wastewater investments and management to mitigate urban flood risks in Gaza", 2021.

59 UN Office for Disaster Risk Reduction (UNDRR), "Comprehensive Risk Management: The How-To in Achieving Coherence at Middle East and North Africa Climate Week", 2022.

60 GFDRR, "MNA Regional Mainstreaming DRM Support", 2021.

In the case of sandstorms and dust storms, which are more regional than local or national phenomena,[61] there is scope for cooperation between the frequently hit Iraq,[62] Syria[63] and Iran[64] but also with other countries that are increasingly affected.[65] Data and early-warning systems can strengthen dialogue, which can be subsequently deepened through joint damage repair work, root-cause analysis and corresponding implementation of countermeasures. Community-based disaster risk reduction, including for adaptation to climate change, could also be leveraged to initiate regional projects.

Another example is high water levels and flooding in the Euphrates-Tigris Basin. Flooding and flash floods resulting from heavy rainfall could be addressed more effectively at transboundary level through cooperation between Turkey,[66] Syria[67] and Iraq.[68] Also here, there is scope for several steps, from a shared warning system to damage repair and joint planning of infrastructure to protect against damage in the event of a disaster. Disaster risk management also offers latitude to initiate or reinvigorate traditional transboundary water cooperation. Preventing floods is more suitable as an entry point for cooperation, as the water distribution issue is not relevant.

In addition to national authorities and disaster risk management institutions, there is scope for involving citizens and the private sector by means of citizen science (see Section 2.3) and early warning systems. National plans and programmes, such as the 'Strengthening the resiliency and sustainability of wastewater investments and management to mitigate urban flood risks in Gaza'[69] project or the Iraqi initiative 'Strengthening GoI Response Readiness'[70] could

61 Varoujan Sissakian, Nadhir Al-Ansari, & Sven Knutsson. "Sand and Dust Storm Events in Iraq", Natural Science 05, no. 10 (2013): 1084–94.
62 Rudaw, "Over a thousand hospitalized as sandstorm hits Baghdad", 2022.
63 Al Jazeera, "'Unprecedented' sandstorm envelops Lebanon and Syria", 2015.
64 The Guardian, "Tehran sandstorm kills four people", 2014.
65 BBC News, "Sandstorm hits Lebanon, Syria, Israel and Jordan", 2015.
66 Borzou Daraghi, "Deadly floods inundate Turkey killing 27 in latest environmental calamity", Independent, 2011.
67 Reliefweb, "Syria: Floods", January 2021.
68 Deutsche Welle, "Deadly floods hit Iraqi Kurdistan", 2021.
69 GFDRR, "Strengthening the resiliency and sustainability of wastewater investments and management to mitigate urban flood risks in Gaza", 2021.
70 USAID, "Europe, The Middle East, and Central Asia – Disaster Risk Reduction, Fact Sheet #1, Fiscal Year 2013", September 2013.

be scaled up or in some cases merged into an internationally backed regional initiative. As internationally established players, UNDRR (UN Office for Disaster Risk Reduction) and the World Bank/Global Facility for Disaster Reduction and Recovery (GFDRR) are well placed to implement initiatives on water-related disaster risk management. The ambitious and established Sendai Framework for Disaster Risk Reduction (2015-2030)[71] could also provide a framework for regional action. UN-ESCWA worked on integrating climate change adaptation and disaster risk management.[72] However, a willingness to cooperate on the part of individual states is paramount for establishing disaster risk management at transboundary level. Given the fast-growing risks, countries in the region should have a genuine interest in creating an effective regional disaster risk management system.

2.5 Supporting water cooperation and peacebuilding in the context of displacement, migration and reconstruction

Water plays a fundamental role in the context of flight and migration across the Middle East: as a potential trigger of these movements, as a prerequisite for securing livelihoods and development including in host communities, and as an entry point for fostering social cohesion.[73] The arrival of refugees in a context of already scarce water resources can cause polarisation and additional pressure on the resource; sustainable and inclusive water management should therefore be a priority in these settings.

Water provision in crises is still very much discussed as a 'hardware issue' (focus on building infrastructure) and as one of humanitarian assistance; and, of course, the urgency to (re-)establish, for instance, drinking water provision is high. However, water provision and infrastructure in communities hosting refugees and in post-conflict reconstruction settings, offer potential for peacebuilding and conflict prevention. Successful EcoPeace Middle East initiatives in the region confirm this, and examples outside the region show how shared visions for

71 UN, "Sendai Framework for Disaster Risk Reduction 2015-2030", 2015.

72 UN-ESCWA, "Climate Change and Disaster Risk Reduction in the Arab Region", ESCWA Water Development Report 7, 2018.

73 Edoardo Borgomeo, Anders Jägerskog, Esha Zaveri, Jason Russ, Amjad Khan, A., & Richard Damania, "Water in the Shadow of Conflict in the Middle East and North Africa", Ebb And Flow, 2. (2021).

common infrastructure management and jointly negotiated rules, processes and institutions can essentially contribute to trust-building and conflict prevention between polarised groups or between host communities and refugees.[74] Women and girls have a particular role to play here, both in peacebuilding[75] and in WASH provision.

Water supply is also very closely linked to government legitimacy and thus an important entry point to (re-)build social contracts between citizens and their government. In Lebanon, for instance, insufficient service provision, including water supply, negatively affects both trust in state institutions and tensions between individual groups. Beyond provision and the WASH sector, sustainable water resources management offers opportunities for peacebuilding and conflict prevention through improved data collection and sharing, coordinated water extraction and wastewater treatment, and cooperation with research institutions.

Cash for Work (CfW) programmes can contribute to fostering social cohesion[76] between refugees and the host societies and are also interesting entry points to support water peacebuilding. While a number of CfW programmes address water resources (WASH, irrigation, dam construction and maintenance), there is scope for improving water-related trust-building and sustainable joint resource management in the long term. This could include border regions, knowledge transfer through returnees, and transboundary collaboration between water management institutions on both sides. Defining CfW less as transitional but more of a long-term development strategy[77] could help harness the potential of water cooperation for strengthening state legitimacy and social cohesion.

74 Timor-Leste, Uganda, Afghanistan, Sudan, Bosnia-Herzegovina and Kosovo have relevant experience in this area. Catholic Relief Services, Saferworld and other organisations also conduct projects drafted relevant guidelines.

75 London School of Economics, "Defending the Future: Gender, Conflict and Environmental Peace", 2021.

76 Markus Loewe, Tinza Zintl, Jorn Fritzenkotter, Verena Gantner, Regina Kaltenbach & Lena Pohl, "Community Effects Of Cash-For-Work Programmes In Jordan: Supporting Social Cohesion, More Equitable Gender Roles And Local Economic Development In Contexts Of Flight And Migration", German Development Institute and Deutsches Institut für Entwicklungspolitik (DIE), 103, (2020).

77 Helge Roxin, Alexander Kocks, Ruben Wedel, Nico Herforth & Thomas Wencker, "Die Wirksamkeit deutscher Entwicklungszusammenarbeit bei konfliktbedingten Fluchtkrisen. Die Beschäftigungsoffensive Nahost", Deutsches Evaluierungsinstitut der Entwicklungs-zusammenarbeit, (2021).

New conflict-sensitive water projects can be promoted, but ongoing activities also provide opportunities to mainstream this concern, such as in WEFE nexus approaches, water knowledge, climate adaptation and citizen science. Moreover, projects that strengthen livelihoods and aim to rebuild infrastructures in conflict and post-conflict regions could be a leverage for water peacebuilding.

In order to boost capacities for and increase the exchange of experiences of the trust-building potential of water resource management in the context of humanitarian crises, a regional hub of countries that have hosted refugees and migrants for many years could be built up and include Jordan, Lebanon, Iraq, Syria and Turkey. Perhaps even more than in other areas, however, it is important in this context to identify quick gains in order to illustrate the value of water cooperation and thus boost long-term ownership; it is also important to apply the 'no-regret' and 'do-no-harm' principles in all initiatives.

3 Conclusions

Water is life and the related challenges in the Middle East are immense. Climate change and resource overexploitation intensify existing shortages and quality problems, which hinders SDG implementation and can trigger or sustain conflicts within and between countries. But the nature of water also makes the resource interesting for inter-state cooperation when linked to trust-building, new opportunities for sustainable development, and more inclusive social contracts. As traditional water diplomacy is coming up against limits in the Middle East due to the highly politicised nature of transboundary (agreements on) water use, new approaches are urgently needed – and some are partly already implemented. The five action areas presented in this report offer less polarised entry points where water cooperation can be promoted through linking local, national and regional interests. These five action areas encourage re-thinking and re-prioritising water cooperation, and adapting or expanding existing approaches.

While some inter-state cooperation exists in relation to action area 1, the water-energy-food-ecosystems (WEFE) nexus, it is predominantly implemented at local level and needs more support in transboundary settings. Here, showcase projects can be promoted and scaled-up regionwide to achieve concrete gains and at the same time support trust-building. In addition, the nexus approach essentially provides the framework for all water-related interventions. Action area 2, water-related ecosystems, is mainly addressed at local level and from an environmental perspective, but also provides opportunities for securing livelihoods and jobs linked to ecosystem services, at both local and transboundary levels. Ecosystem conservation is less politically contested and directly addresses the immediate consequences of water scarcity and climate change. Comprehensive water knowledge, action area 3, offers great scope for action on better understanding regional, national and local water challenges, developing adequate solutions and mobilising necessary ownership for implementation. Water knowledge and approaches such as citizen science involve the population and help to build trust between state and citizens. Action area 4, regional water-related disaster risk reduction, provides concrete opportunities for bringing together national and regional interests in foreseeing and adapting to droughts, floods, and sand and dust storms. It provides obvious, non-controversial and tangible benefits from transboundary cooperation in terms of prevention (for instance, early warning

systems), management and response (technical support during and after disasters). Last but not least, action area 5 focuses on displacement, migration and reconstruction, where addressing urgent water infrastructure needs can provide opportunities for confidence-building and for strengthening socially and environmentally sustainable resource management.

Despite, and precisely because of, the difficulties with regional water cooperation, the individual thematic entry points can be implemented in multi-level approaches. In that way, they offer solutions for responding to local and national pressure for action, while at the same time addressing common regional challenges and possible solutions through transboundary capacity development and dialogue. Local and national options for action thereby facilitate regional and intergovernmental approaches in the Middle East. Neighbouring countries should be involved where (politically) feasible – for example Turkey as an influential player not only along the Euphrates and Tigris, but also in the border regions it controls next to or in Syria and Iraq.

Local and external actors could address challenges in the action areas individually or could leverage mutual interdependencies, for example when water knowledge improves data availability in regions affected by flooding. Beyond the single action area, successful interventions at national level could have indirect positive effects at transboundary level, for instance when improved WEFE nexus governance contributes to reducing overall pressure on water resources, thereby easing tensions between states. Sometimes technical capacity development measures in specific action areas can promote transboundary dialogue and create space for dialogue which may not be politically feasible in other areas.

The five action areas proposed here offer potential at multiple levels and from different perspectives – including re-framing inter-state water cooperation and breaking stalemates in transboundary water cooperation and water diplomacy. While concrete action needs to be carefully embedded in the respective political priorities and needs, it benefits from a general orientation towards win-win solutions building upon local needs while supporting regional change.